THE CIRCULATION OF FOREIGN COINAGE:
AN AMERICAN RESPONSE,
CA. 1750–1857

by

Jesse C. Kraft

A dissertation submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Philosophy in History

Summer 2019

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AN AMERICAN RESPONSE,
CA. 1750–1857

by

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ABSTRACT

From the earliest days of the British-American colonies, up though early 1857, a variety of foreign coinage circulated. At various times, coins from Spanish-America, Great Britain, France, and Brazil held legal tender status and formed a majority of the hard-money supply in the United States. Most of these coins did not conform to the predominant unit of account (i.e. “dollars” or “pounds”) and forced American consumers and merchants to navigate this system through a variety of ingenious, though sometimes confounding methods: from abstract mathematical formulas to prolonged usage of British monetary terminologies. Furthermore, the different types of the foreign pieces had a range in qualitative factors that allowed for easy manufacture and circulation of counterfeit coins. Money scales—the devices used to detect such pieces—proved unfit for desired effect. Despite these factors and hindrances, the coins freely circulated due to the familiarity that several generations of Americans had with them. New types of foreign coins introduced throughout the 1840s and 1850s, however, proved unable to circulate due to an overall lack of familiarity with the coins.
Chapter 1

THE CIRCULATION OF FOREIGN COINAGE IN THE UNITED STATES:
A BRIEF INTRODUCTION

Figure 1  Payment by Joseph Sturgis to Thomas Shields, December 7, 1776.
Thomas Shields, Daybook, 69. The Joseph Downs Collection of Manuscripts and
Printed Ephemera at the Winterthur Museum, Garden & Library, Folio 27.

This entry from the daybook of Philadelphia gold and silversmith Thomas
Shields is a telling example of the monetary conditions faced by early Americans, and
it suggests how they reckoned with these circumstances. [See Figure 1]. On December
7, 1776, Shields received payment for a debt from an individual named Joseph Sturgis
in the amount of 75 pounds, three shillings, and nine pence (£75.3s.9d.). The nature of
the debt is unknown, but the entry demonstrates a staggeringly complex method of
payment: 20 whole dollars, 18½ more dollars, 70 shillings, five guinea coins, a French
Crown, six half Joes, and three pieces of Gold equal to 4½ Dollars. This concoction of
foreign coins spanned the four major European empires of the Americas—Spanish,
English, Portuguese, and French—and was a fairly accurate microcosm of the hard money supply in Philadelphia and throughout the Mid-Atlantic States and New England. Well into the 19th century, such complicated payments were a reality for those who used physical currency.

This dissertation is about the circulation of foreign coinage in the United States in the 18th and 19th centuries. It reconstructs the historical methods that American consumers and merchants such as Shields and Sturgis used in order to make transactions such as that above. It examines the various methods of arithmetic devised specifically for the conversion of foreign coinage, as well as the resources available for individuals to learn this information. It traces the evolution of pricing structures based on prevalent foreign coins in circulation and how these structures varied from region to region within the country. It shows how the presence of foreign coinage in circulation led to an exponential increase in counterfeit and lightweight coins and that Americans never really had access to convenient or trustworthy methods of evaluating their coins. It explains why the eventual success of the United States dollar depended on the circulation of foreign coinage and how individuals grew hostile towards the increasingly unfamiliar foreign coinage that entered the United States in the mid-19th century. This dissertation seeks to place the evolution of the United States monetary system within the conceptualization of ideas about what it meant to be “American”; to show the historical trends—ebbs and flows—between a globalizing world and the political strength of nationalist thinkers; and to provide present-day readers with a better appreciation for the simplicity of the modern United States monetary system.
The Foreign Coinage that Circulated in the United States

To set the context for this dissertation, a brief introduction to the main foreign coinage that circulated in the United States through the 18th and early-19th centuries—Spanish-American, British, Portuguese-American, and French—is useful. Regardless of where the coins originated, they arrived in the British-American colonies and the United States through some sort of international trade. This, however, did not necessarily indicate trade between the United States and the nation-empire named on the coin. Just as foreign coins circulated in the United States, foreign coins circulated in many other nations as well. Dutch, Danish, and German coins, along with other pieces, also circulated in the United States, but they were much less common than coins from the four empires.

Through the colonial period and into the mid-19th century, Spanish-American coins dominated the circulation of foreign coinage in the United States. This was especially true with silver coins. Thomas Wilson estimates that “Spanish milled dollars vastly exceeded other forms of specie in circulation by three or four to one.”¹ As known throughout Spanish Empire, the real de a ocho acted as the unit silver coin. By the 17th century, British-American colonists knew this coin as the dollar. [See Figure 2]. On May 8, 1675, for example, Boston merchant and mintmaster John Hull received “369oz. 1/2 sterling silver dollars into ye mint house to be Coyned”—worth about 132 pounds, 17 shilling, 10 pence (£132.17.10) in Massachusetts silver.² Table 1


² John Hull, Ledger, Folio 26 verso, The New England Historic Genealogical Society, Boston, Massachusetts, MS CB 110, volume 1. Mathematically, Spanish-American dollars were then coined into more than 2,657 Massachusetts shillings, 5,315 sixpence, 10,631 threepence, or a combination of the three denominations.
shows the various denominations of the Spanish-American monetary system; their compositions, weights, and diameters; as well as their relative value in early-19th century United States dollars. The Spanish-American dollar divided into fractions: halves, quarters, eighths, and sixteenths. The eighths and sixteenths-of-a-dollar circulated especially heavily throughout the country. While the dollar contained eight reales, the half dollar had four reales, and so on. The designs of each of these coins mimicked each other, making them easily recognizable as a series. Spanish-American gold coins also circulated in proportion with the silver pieces. Ranging from one to eight escudos, the smallest gold coin equaled two of the largest silver pieces (16 reales) while the largest contained the equivalent of 128 reales, or 16 dollars. By the early 1820s, Spanish-American coinage ceased production as the former colonies became independent nations. As the coins of these new nations never achieved legal-tender status in the United States, the colonial coinage that continued to circulate wore beyond recognition.

Through this period, the American colonies of Spain struck three different types of coins. The types and designs were the same from the ½ real up to the eight-escudo coin. Pre-1728 coins were of the “cob” type—struck without collars, making them misshapen. The obverse portrayed the Spanish coat of arms with the inscription PHILIPVS V DEI G during the reign of Philip V, meaning “Philip V, by the grace of God.” The reverse had a quartered cross with lions and castles in each corner.

“Milled” pieces did appear until 1732. The addition of a collar to the production process allowed these coins to be nearly perfectly round. American knew coins struck before 1772 as “pillar dollars” due to the pronounced reverse design of a crowned globe flanked by two pillars. The obverse inscription for Ferdinand VI read
FRD•VI•D•G•HISP•ET IND•R (“Ferdinand VI, by the grace of God, King of Spain and the Indies”), while the reverse read VTRAQUE VNUM (“Both and One”). After 1772, the emperor’s bust appeared on the obverse.

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<td></td>
<td>2 Escudo</td>
<td></td>
<td>Same as ½ Escudo</td>
<td>6.76g</td>
<td>26mm</td>
<td>$4.00</td>
</tr>
<tr>
<td></td>
<td>4 Escudo</td>
<td></td>
<td>Same as ½ Escudo</td>
<td>13.54g</td>
<td>34mm</td>
<td>$8.00</td>
</tr>
<tr>
<td></td>
<td>8 Escudo</td>
<td></td>
<td>Same as ½ Escudo</td>
<td>27.06g</td>
<td>39mm</td>
<td>$16.00</td>
</tr>
</tbody>
</table>

While Spanish-American dollars and their fractions were the most ubiquitous coins in colonial and early-Republic circulation, the British pound acted as the basis for the unit of account in the United States until the late-18th and early-19th centuries. Four farthings equaled one penny (1d.), 12 pence (plural of penny) equaled a shilling (1s.), and 20 shillings equaled one pound (£1). A guinea equaled 21 shilling (21s.), or one pound and one shilling (£1.1s.). [See Table 2]. Silver sixpence and one-shilling

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coins appeared more often than other British silver coins. Both guinea and sovereign coins circulated in the United States, though guineas more so. As the British pound evolved into various state shilling-pence systems through the 18th and early 19th centuries (see Chapter 2), British coins continued to circulate—with the exception of copper coins, which ceased to circulate ca. 1790.

All British coins portrayed the monarch on the obverse. [See Figure 3]. The obverse of a British halfpenny from the 1770s, for example, showed King George III facing right, with the inscription GEORGIVS III REX (“King George III”). The reverse showed Britannia, the idealized personification of Great Britain. The reverse of silver one penny through fourpence coins showed a crowned numeral (i.e. a fourpence had the numeral “4” with a crown on top). The reverse of the larger silver coins contained four shields, representing England, Scotland, Ireland, and Wales. Like most other coins of the era, the inscriptions were in abbreviated Latin. The reverse of a 1787 shilling read M•B•F•ET•H•REX•F•D•B•ET•L•D•S•R•I•A•T•ET•E•*, for MAGNÆ BRITANNIÆ FRANCIÆ ET HIBERNIÆ REX FIDEI DEFENSOR BRUNSVICENSIS ET LUNEBURGENSIS DUX SACRI ROMANI IMPERII ARCHI-THESAURARIUS ET ELECTOR, or “King of Great Britain, France and Ireland, Defender of the Faith of Brunswick and Lunenburg, Duke, Holy Roman Emperor, Arch-treasurer and Elector.”

Table 2 — British Coinage

<table>
<thead>
<tr>
<th>Metal</th>
<th>Denomination</th>
<th>Date Range</th>
<th>Composition</th>
<th>Weight</th>
<th>Diameter</th>
<th>Value in $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>Farthing</td>
<td>1714–1775</td>
<td>100% Copper</td>
<td>4.93g</td>
<td>23mm</td>
<td>$0.005</td>
</tr>
<tr>
<td></td>
<td>Halfpenny</td>
<td>1717–1775</td>
<td></td>
<td>9.86g</td>
<td>29mm</td>
<td>$0.010</td>
</tr>
<tr>
<td></td>
<td>Penny</td>
<td>1703–1800</td>
<td>0.925 Silver</td>
<td>0.50g</td>
<td>12mm</td>
<td>$0.018</td>
</tr>
<tr>
<td></td>
<td>Twopence</td>
<td>Same as Penny</td>
<td></td>
<td>1.00g</td>
<td>14mm</td>
<td>$0.037</td>
</tr>
<tr>
<td></td>
<td>Threepence</td>
<td>Same as Penny</td>
<td></td>
<td>1.50g</td>
<td>17mm</td>
<td>$0.055</td>
</tr>
<tr>
<td></td>
<td>Fourpence</td>
<td>Same as Penny</td>
<td></td>
<td>2.00g</td>
<td>19mm</td>
<td>$0.073</td>
</tr>
<tr>
<td></td>
<td>Sixpence</td>
<td>1707–1787</td>
<td>0.925 Silver</td>
<td>3.00g</td>
<td>21mm</td>
<td>$0.110</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1816–1920</td>
<td></td>
<td>2.83g</td>
<td>19mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shilling</td>
<td>1707–1798</td>
<td></td>
<td>6.00g</td>
<td>25mm</td>
<td>$0.220</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1816–1919</td>
<td></td>
<td>5.65g</td>
<td>24mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>½ Crown</td>
<td>1707–1751</td>
<td></td>
<td>15.00g</td>
<td>33mm</td>
<td>$0.550</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1816–1919</td>
<td></td>
<td>14.10g</td>
<td>32mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Crown</td>
<td>1707–1751</td>
<td></td>
<td>30.00g</td>
<td>39mm</td>
<td>$1.100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1816–1902</td>
<td></td>
<td>28.28g</td>
<td>38mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>¼ Guinea</td>
<td>1718–1762</td>
<td>0.916 Gold</td>
<td>2.10g</td>
<td>16mm</td>
<td>$1.20</td>
</tr>
<tr>
<td></td>
<td>½ Guinea</td>
<td>1707–1813</td>
<td></td>
<td>4.20g</td>
<td>20mm</td>
<td>$2.40</td>
</tr>
<tr>
<td></td>
<td>Guinea</td>
<td>1707–1813</td>
<td></td>
<td>8.40g</td>
<td>25mm</td>
<td>$4.80</td>
</tr>
<tr>
<td></td>
<td>2 Guinea</td>
<td>1709–1753</td>
<td></td>
<td>16.80g</td>
<td>32mm</td>
<td>$9.60</td>
</tr>
<tr>
<td></td>
<td>5 Guinea</td>
<td>1706–1753</td>
<td></td>
<td>41.75g</td>
<td>37mm</td>
<td>$24.00</td>
</tr>
<tr>
<td></td>
<td>½ Sovereign</td>
<td>1817–1937</td>
<td></td>
<td>3.99g</td>
<td>19mm</td>
<td>$2.28</td>
</tr>
<tr>
<td></td>
<td>Sovereign</td>
<td>1817–1968</td>
<td></td>
<td>7.99g</td>
<td>22mm</td>
<td>$4.56</td>
</tr>
</tbody>
</table>

Portuguese-American colonial coins from Brazil also circulated. This series consisted of reis. Unlike most other monetary systems that have fractions and multiples of a unit coin (e.g. ½ guinea, guinea, and 2 guinea coins), Portuguese coins simply used multiples of reis. [See Table 3]. A one-reis coin never existed, as that denomination would have proven too small to be useful. Through the 18\textsuperscript{th} and early 19\textsuperscript{th} centuries, copper reis appeared in denominations of five, 10, 20, 37½, 40, and 75 reis, but these never circulated in the United States. Instead, Portuguese gold coins circulated in the British-American colonies and into the early Republic much more than their silver counterparts in the United States. In the United States, the most

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\(^{5}\) Bruce, 629–647. Bruce, 501–521.
common Portuguese coin was the gold 6,400 reis, which Americans knew as a “half jöe,” followed by the 12,800-reis coin, known as a “one jöe.” [See Figure 4].

Portuguese-American coins had two sets of designs. Gold coins in multiples of 1,000 pictured a crowned shield on the obverse and a large cross on the reverse, while those in multiples of 1,200 portrayed the monarch on the obverse and a crowned shield on the reverse. The obverses of both types from the reign of Joseph I, for example, contained the inscription JOSEPHUS••D•G•PORT•ET•ALG•REX, meaning “Joseph I, by the grace of God, King of Portugal and the Algarve” in Latin. The reverse of the crowned-shield read IN HOC SIGNO VINCES (“In this sign, you will conquer”), while the portrait type contained no inscription on the reverse.

<table>
<thead>
<tr>
<th>Metal</th>
<th>Denomination</th>
<th>Date Range</th>
<th>Composition</th>
<th>Weight</th>
<th>Diameter</th>
<th>Value in $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver</td>
<td>40 reis</td>
<td>1695–1702</td>
<td>0.917 Silver</td>
<td>1.12g</td>
<td>16mm</td>
<td>$0.040</td>
</tr>
<tr>
<td></td>
<td>75 reis</td>
<td>1752–1760</td>
<td></td>
<td>2.26g</td>
<td>20mm</td>
<td>$0.079</td>
</tr>
<tr>
<td></td>
<td>80 reis</td>
<td>1695–1822</td>
<td></td>
<td>2.24g</td>
<td>20mm</td>
<td>$0.079</td>
</tr>
<tr>
<td></td>
<td>150 reis</td>
<td>1752–1760</td>
<td></td>
<td>4.53g</td>
<td>25mm</td>
<td>$0.160</td>
</tr>
<tr>
<td></td>
<td>160 reis</td>
<td>1695–1822</td>
<td></td>
<td>4.52g</td>
<td>24mm</td>
<td>$0.160</td>
</tr>
<tr>
<td></td>
<td>300 reis</td>
<td>1752–1771</td>
<td></td>
<td>9.06g</td>
<td>30mm</td>
<td>$0.375</td>
</tr>
<tr>
<td></td>
<td>320 reis</td>
<td>1695–1822</td>
<td></td>
<td>8.96g</td>
<td>30mm</td>
<td>$0.317</td>
</tr>
<tr>
<td></td>
<td>600 reis</td>
<td>1752–1774</td>
<td></td>
<td>18.12g</td>
<td>35mm</td>
<td>$0.641</td>
</tr>
<tr>
<td></td>
<td>640 reis</td>
<td>1695–1822</td>
<td></td>
<td>17.92g</td>
<td>37mm</td>
<td>$0.634</td>
</tr>
<tr>
<td></td>
<td>960 reis</td>
<td>1810–1822</td>
<td></td>
<td>27.07g</td>
<td>40mm</td>
<td>$0.957</td>
</tr>
<tr>
<td>Gold</td>
<td>800 reis</td>
<td>1727–1777</td>
<td>0.917 Gold</td>
<td>1.79g</td>
<td>17mm</td>
<td>$1.00</td>
</tr>
<tr>
<td></td>
<td>1,000 reis</td>
<td>1703–1774</td>
<td></td>
<td>2.04g</td>
<td>18mm</td>
<td>$1.54</td>
</tr>
<tr>
<td></td>
<td>1,600 reis</td>
<td>1752–1777</td>
<td></td>
<td>3.58g</td>
<td>21mm</td>
<td>$2.00</td>
</tr>
<tr>
<td></td>
<td>2,000 reis</td>
<td>1703–1783</td>
<td></td>
<td>4.08g</td>
<td>23mm</td>
<td>$3.07</td>
</tr>
<tr>
<td></td>
<td>3,200 reis</td>
<td>1727–1786</td>
<td></td>
<td>7.17g</td>
<td>20mm</td>
<td>$4.00</td>
</tr>
<tr>
<td></td>
<td>4,000 reis</td>
<td>1703–1822</td>
<td></td>
<td>10.75g</td>
<td>30mm</td>
<td>$6.14</td>
</tr>
<tr>
<td></td>
<td>6,400 reis</td>
<td>1727–1822</td>
<td></td>
<td>14.34g</td>
<td>32mm</td>
<td>$8.00</td>
</tr>
<tr>
<td></td>
<td>10,000 reis</td>
<td>1724–1727</td>
<td></td>
<td>26.89g</td>
<td>33mm</td>
<td>$12.28</td>
</tr>
<tr>
<td></td>
<td>12,800 reis</td>
<td>1727–1733</td>
<td></td>
<td>28.68g</td>
<td>35mm</td>
<td>$16.00</td>
</tr>
<tr>
<td></td>
<td>20,000 reis</td>
<td>1724–1727</td>
<td></td>
<td>53.78g</td>
<td>38mm</td>
<td>$24.56</td>
</tr>
</tbody>
</table>

---

French coins represented the last of the four major types of foreign coinage that circulated in the United States during the 18th to mid-19th centuries. Before the French Republic, the monetary system consisted of pre-decimal livres. [See Figure 5].

The monetary system of the ancien régime used twelve deniers to equal one sol, while 20 sols equaled one livre, six livres equaled 1 écu, and 4 ecus was the equivalent of one louis d’or. [See Table 4]. Like Spanish-American and Portuguese-American coins, French copper coins did not circulate to any large degree in the British-American colonies and the United States, though French coins struck for their Caribbean possessions lightly circulated in the Louisiana territory in the first half of the 18th century. Primarily, larger French silver coins and most denominations of gold coins found their way across the Atlantic, with silver ecus and gold louis d’or coins as the most available. Americans knew the former coin as a “French crown,” such as the piece accepted by Thomas Shields in the opening account book entry.

In 1795, the French Revolutionary Convention introduced the decimal franc coinage. [See Figure 6]. Although a completely new and different monetary system, in order to convert from the old system to the new, the Convention set the franc at the equivalence of 1.0125 livres. Like their earlier counterparts, only the large silver and gold coins of post-Revolutionary France circulated in the United States, while copper and smaller silver coins did not. Whereas the earlier coins continued the tradition of Latin inscriptions on their coins, those of the First French Republic and later did not.

For example, the inscription of a gold louis d’or of Louis XVI read LUD•XVI•D•G•FR•ET•NAV•REX (or LVDOVICVS XVI DEI GRATIA FRANCÆ ET NAVARRÆ REX, “Louis XIII, by the grace of God, King of France and of
Navarre”) while the gold coins of the First Empire of Napoléon Bonaparte (1804–1814/15) simply read in French NAPOLEON EMPEREUR, or “Emperor Napoleon.”

<table>
<thead>
<tr>
<th>Metal</th>
<th>Denomination</th>
<th>Date Range</th>
<th>Composition</th>
<th>Weight</th>
<th>Diameter</th>
<th>Value in $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver</td>
<td>1/2 Ecu</td>
<td>1641–1792</td>
<td>0.917 Silver</td>
<td>14.74g</td>
<td>33mm</td>
<td>$0.521</td>
</tr>
<tr>
<td></td>
<td>Ecu</td>
<td>1641–1792</td>
<td></td>
<td>27.45g</td>
<td>39mm</td>
<td>$1.042</td>
</tr>
<tr>
<td></td>
<td>Franc</td>
<td>1803–1863</td>
<td></td>
<td>5.00g</td>
<td>23mm</td>
<td>$0.188</td>
</tr>
<tr>
<td></td>
<td>2 Franc</td>
<td>1803–1870</td>
<td>0.900 Silver</td>
<td>10.00g</td>
<td>27mm</td>
<td>$0.376</td>
</tr>
<tr>
<td></td>
<td>5 Franc</td>
<td>1796–1871</td>
<td></td>
<td>25.00g</td>
<td>29mm</td>
<td>$0.940</td>
</tr>
<tr>
<td>Gold</td>
<td>½ Louis d’or</td>
<td>1640–1784</td>
<td>0.917 Gold</td>
<td>4.84g</td>
<td>20mm</td>
<td>$2.76</td>
</tr>
<tr>
<td></td>
<td>Louis d’or</td>
<td>1640–1792</td>
<td></td>
<td>7.65g</td>
<td>25mm</td>
<td>$5.53</td>
</tr>
<tr>
<td></td>
<td>2 Louis d’or</td>
<td>1640–1792</td>
<td></td>
<td>15.30g</td>
<td>29mm</td>
<td>$11.06</td>
</tr>
<tr>
<td></td>
<td>20 Franc</td>
<td>1803–1870</td>
<td>0.900 Gold</td>
<td>6.45g</td>
<td>21mm</td>
<td>$3.68</td>
</tr>
<tr>
<td></td>
<td>40 Franc</td>
<td>1805–1846</td>
<td></td>
<td>12.90g</td>
<td>26mm</td>
<td>$7.37</td>
</tr>
</tbody>
</table>

While the above tables may seem overly detailed, the information within each column was pertinent for a 19th-century individual to properly value his or her money. The difference between 0.900-fine gold and 0.917-fine gold might sound miniscule, but it made a difference in the value of a coin. Additionally, the weight of a coin contributed largely to its value. Each gram of gold equaled 57 cents, which added up as excessively worn coins lost as much as 25% of their weight. Even the year in which a coin was struck contributed to its overall value. Table 1, for example, shows that the fineness of Spanish-American gold coinage had three distinct eras: 1690–1771, 1772–1784, and 1785–1820. In the 1790s, when coins from all three eras actively circulated, it became increasingly difficult to accurately assign a value to a coin.

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7 Bruce, 163–244. Bruce, 298–333.
Scope and Chapters

This dissertation examines the tools and concepts American consumers and merchants needed to master to navigate the array of foreign coinage that circulated in the United States from the mid-18th to the mid-19th centuries. It shows how consumers and merchants operated in daily commerce with coins that originated from other countries and empires, and reconstruct the problems that this system created. American consumers and merchants required two things to adequately manage the circulation of foreign coinage in the United States: information about the coins of other countries, and the ability to verify the value as specie. Although the United States government authorized a decimalized system of money in 1785, the dissimilar (and often incompatible) monetary systems that continued to circulate during a transitional period towards full monetary decimalization were a fact of life for the first three generations of American consumers. While burdensome, this influenced the ways in which merchants and consumers bought and sold items, priced goods, and even how they thought about money as a quantifiable material.

This dissertation asks why American consumers had to function under these circumstances for so long, including why the transition to the sole use of the United States dollar was so protracted. It examines material aspects of the coins and non-material concepts of circulation to answer these questions. Conceptually, most early American consumers and merchants understood the need for the circulation of foreign coinage for the sake of daily commerce, and they employed a variety of mathematical operations to allow for their proper usage, notably forms of arithmetic, metrology, fractions, and geometry. Materially, a variety of tools existed for consumers and merchants to receive both information and verification on the relative monetary values
of foreign coinage, including arithmetic books, exchange-rate charts, and money scales.

This dissertation presents a history of money that combines facets of numismatics, consumption, personal finance, mathematics, and economic development. It focuses on the daily requirements of American consumers from the mid-18th through the mid-19th centuries, including the processes often needed to make a purchase, regardless of the item. Instead of asking what consumers acquired and why, this dissertation asks how they paid for their purchases and under what circumstances. This dissertation decenters banks and the government from the historical discussion of monetary circulation as much as possible and focuses instead on the day-to-day encounters of Americans and their money.

Chapter One argues that individuals navigated this complex monetary system through the use of now obscure mathematical formulas and rules. Their use allowed people to convert the various types of money into a common unit of account and exchange while using like terms. Primary methods included reduction, the Rule of Three, and the Rule of Practice. The main function of each of these was to convert the various types of foreign coinage that circulated in the United States into a standard unit of account that both parties of a transaction felt comfortable with. This was important as buyers and sellers could not settle on the cost of an item until they spoke in like terms.

The use of foreign coinage especially necessitated a common terminology. Individuals who received a basic education learned to comprehend specific and complicated functions of currency at a relatively early age. Students generally learned reduction, the Rule of Three, and the Rule of Practice in that order and directly after
they learned the basic functions of addition, subtraction, multiplication, and division. Practical and useful, this knowledge became a part of the economic toolkit of American consumers and merchants as they purchased and sold goods and services to one another. By the time these individuals began to participate in the local, national, or international economies, they were adept in understanding the exchangeable nature of money. Both consumers and merchants reinforced this knowledge with up-to-date information found through a variety of sources, such as almanacs, commercial directories, and ready reckoners.

The second chapter argues that the circulation of Spanish-American coin through the colonial period and into the 19th century resulted in the extended use of a pricing structure based on *shillings* and *pence*. Those words became part of the vernacular of English-speaking Americans. While the meaning of these terms varied from place to place and often caused confusion for those who travelled into another region of the country, pricing structures in the different regions reflected those variances. The one-real coin, for example, had four different names through the nation and five different values in shillings and pence, yet only one amount in federal monetary terms: 12½ cents. In fact, 12½ cents was a very common price for many items throughout the first half of the 19th century due to the prevalence of the one-real coin in circulation. Historian Robert Garson notes that these “disadvantages” in the decimal system “explain in part the persistence” of the pound-shilling-pence system into the 19th century.8

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By the 1840s, the physical condition of the Spanish-American coinage in circulation was poor. Some coins were so worn that they weighed 25 percent less than they should have done. American merchants began to respond with a pricing structure that paralleled the domestic decimal coinage to make up for the loss. Items formerly priced at 12½ cents were reduced to 10 cents. While initially burdensome, this actually allowed the day-to-day commerce and pricing structure in the United States to decimalize, based on dimes and cents. With the passage of the Coinage Act of 1857, Congress deemed that the United States no longer required Spanish-American silver, and consumers and merchants quickly removed the coins from circulation. In rural regions of the United States, however, the former shilling-pence system continued until the 1870s, with some reports of it lasting until the First World War.

The third chapter argues that the circulation of foreign coinage facilitated and proliferated the spread of counterfeit coins, as well as overtly damaged and lightweight coins, yet the instruments used to value them proved insufficient to the task. The range in quality of coinage from the various European and North and South American mints made it difficult to discern what was genuine and what was counterfeit. As a result, counterfeit coins ran rampant in the early 19th century. While they needed to identify and reject counterfeit coins of the many different types of foreign coins in circulation, American consumers and merchants also needed skill at recognizing the several different methods of counterfeiting. Not only did “counterfeit” coins include fake coins produced by an illicit mint either by casting or striking with a die, but counterfeiters employed several methods to extract value from genuine coins before passing them off as unadulterated. These included coins that were “sweated” by aqua regia, “clipped” coins whose edges were trimmed, and “plugged” coins whose
inner metals were replaced with those of lesser value. Furthermore, the problems associated with counterfeit and lightweight coins did not confine themselves to foreign coinage; once a domestic coinage appeared in the 1790s, counterfeiters targeted those coins as well.

By giving consumers and merchants the ability to value their unrecognizable, lightweight, and suspicious coins, money scales offered the perception of justice to those who used them. While individuals employed money scales to value their suspicious coinage, they actually distrusted these fragile and fickle instruments. Many people doubted the sensitivity, accuracy, and precision of money scales, as well as the accuracy of the accompanying money weights used to compare the coins. In theory, the use of coinage in general should have obviated the use of balance scales as an essential tool for making economic transactions. A principal advantage of a uniform coinage was to inform consumers and merchants that a particular piece of gold or silver equaled a specific weight, fineness, and value. However, people continued to use money scales through the 18th century. In the years prior to the conclusion of the circulation of foreign coinage in 1857, however, Americans began to devise other methods to determine the quality of their coinage, known as *counterfeit detectors*. While counterfeit detectors did not answer to the exact value of a coin, they provided a “yes” or “no” answer as to whether a person should accept a particular coin or not. The design and construction of the counterfeit detectors proved to have further weaknesses and did not act as acceptable replacements for traditional money scales. Ultimately, the use of money scales represented distrust in the value of a coin, regardless of when, where, and how it came to be.
Last, the circulation of foreign coinage in the United States depended on the familiarity that American consumers and merchants had with them and affected how the United States monetary system evolved. The fourth chapter opens with an examination of two different proposals for monetary systems in the United States—a duodecimal system by Robert Morris in 1782, and the decimal system by Thomas Jefferson in 1785—and how each of them revolved around both the familiarity that Americans had with foreign coinage and the continued circulation of these pieces. The decimal system of Jefferson, ultimately, flourished over the other. However, even once the government had created the new domestic system, foreign coinage legally circulated alongside the United States dollar. Through the 1840s, conversation on the circulation of foreign coinage revolved around the dependency that the economy continued to have on foreign specie, and grew to include discussion on the inadequacies of the Mint in Philadelphia, the pros and cons of restriking foreign coinage into United States dollars, and the constitutionality and legal-tender status of that coinage (or that the law forced individuals to accept them whether or not they wanted to).

By the 1840s, the primary source for foreign coinage shifted from international commerce by merchants to the first large-scale wave of immigrants into the United States. The New York City Custom House ushered the majority of these immigrants into the nation. These immigrants came from a number of the German States and brought unfamiliar gold and silver coinage. These coins proved unable to circulate among the majority of consumers and merchants in the United States. Despite the experience that Americans had with foreign coinage, familiarity proved to be the key to successful circulation. Without this simple trait, many felt that they could not
identify the coin from one region over that of another, let alone confidently ascertain their value. This was not only the case with foreign coinage in the United States, but with coinage in general, and with any type of system. In the mid-19th century, however, the language that Americans used to express their dismay with unrecognizable foreign coinage reflected broader popular debates linked to nationalism, nativism, and prejudice. Individuals discussed the need for an “American coin;” expressed the “manifest” interest in restriking foreign coin (a term redolent of “manifest destiny”); called the newly arrived coinage “foreign trash,” expressing their disdain toward cheap foreign goods that entered the nation; and even demanded that coins be “naturalized” before being allowed to circulate freely through the nation.

This dissertation does not intend to provide a complete history of the monetary conditions that American consumers and merchants faced through the 18th and 19th centuries. There are many facets of United States monetary history that are intentionally omitted, as they do not fit within the scope of this dissertation. The functions and history of banking, for instance, do not play a significant role in this dissertation. While these institutions issued immense quantities of paper currency at

9 Organizational theorists Russell L. Ackoff and Fred E. Emery note how nearly all purposeful systems become more efficient as the degree of familiarity that a participant has with different traits of a given system. Russell L. Ackoff and Fred E. Emery, On Purposeful Systems: An Interdisciplinary Analysis of Individual and Social Behavior as a System of Purposeful Events (New Brunswick: Aldine Transaction, 2009), 42.

various times throughout the period under consideration, they were all of local, state, and (eventually) national issues denominated in dollars and cents (or pounds, shillings, and pence up through the late 18\textsuperscript{th} century), so the factors that went into the circulation of foreign coinage do not apply. This dissertation focuses not upon the official processes that created money, but on forms of money that did not mathematically conform to the assumed system yet remained completely legal and widely accepted. This situation also applies to the diverse types of paper currency issued by the “wildcat banks” of the Free Banking era, 1837 to 1862. This is not to say that banks played no role in the circulation of foreign coinage. On October 4, 1806, for instance, Boston merchant Benjamin Clarke “Deposited this day in the Bank in Foreign Money, $3,102.30,” then another $300 on June 12, 1807.\textsuperscript{11} Instead, this dissertation seeks to understand the various methods that American consumers and merchants used in order to navigate the system, not the larger institutions that controlled the system. In a sense, it seeks to answer the question, how did Clarke know that he had $3,102.30 in foreign currency?

Similarly, this dissertation does not focus on accounting systems for bartered items or traded services. The majority of transactions in 17\textsuperscript{th} to early-19\textsuperscript{th} century ...
American account books likely represented a bartered item or traded service, albeit converted into a monetary sum in order to keep track of profits and losses. E.S. Winslow, in his 1836 work, *System of Book-keeping by Double Entry*, for example, suggested to use a cash-book “for the entry of all cash transactions…and the profits on petty transactions in barter.”¹² However, much like the paper currency that circulated throughout the nation, the barter and service-accounting systems generally used pounds, shilling, and pence to about the end of the 18th century, or dollars and cents after that.

**Historiography**

This dissertation contributes to several historiographic branches of United States history. These primarily include those of money and consumption. Furthermore, it is linked to the historiographies of standardization and of education in the United States. An early and important work in monetary history, *A History of Currency in the United States* (1903) by A. Barton Hepburn, continues to influence historians on the subject. Offering a thorough review of many different currencies that circulated in the United States, it established the historical periods that many historians continue to use when discussing 19th century money. Hepburn divided the bulk of the text into three parts, in which the Civil War served as a definitive turning point in his narrative on currency. The first three chapters deal specifically with metallic currencies that circulated prior to the Civil War, divided into three periods: 1776–1789, 1790–1829, and 1830–1860. Other chapters examine paper currencies. Published in 1903, the text

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is a product of its time, with Part Three focusing on “the silver contest of 1896” and The Reform Act of 1900.\textsuperscript{13} Reprints of the 1915 revised edition organize the earlier chapters into a more organic structure that does not treat paper and metallic currencies as two separate entities. This allows Hepburn to merge the two types of currencies into one historical narrative, to focus on them as a single monetary system.\textsuperscript{14} The book continues to be foundational for scholars who choose to approach this subject, including George Macesich, Richard H. Timberlake, William F. Hixson, Angela Redish, and Ronald E. Seavoy.\textsuperscript{15}

An early and accurate representation of the monies that circulated in the colonial period and into the early Republic came in the form of a harsh review of the 1883-work \textit{History of the People of the United States} by John B. McMaster. In 1886, Israel Ward Andrews, in “McMaster on Our Early Money,” corrected nearly every sentence that the famed historian uttered regarding money. According to Andrews, McMaster showed “great carelessness” and incorporated “divers inaccuracies” into most of his interpretation.\textsuperscript{16} At times, Andrews reprinted large sections of text, then

\begin{itemize}
\item \textsuperscript{13} Hepburn, \textit{A History of Coinage and Currency in the United States} (1903,).
\item \textsuperscript{14} Hepburn, \textit{A History of Currency in the United States} (1967).
\item \textsuperscript{16} Israel Ward Andrews, “McMaster on Our Early Money,” \textit{Magazine of Western History} 4, 2 (June 1886): 142.
\end{itemize}
made correction after correction. After he presented what McMaster stated on Spanish-American coins, for instance, Andrews wrote, “It is not correct to say that the English pound was one of the two units of value. The Spanish dollar was not divided into shillings, or Spanish bits, or pistareens, or pennies, or coppers. A Spanish bit was not equal to a pistareen. In New England a dollar was not equal to one hundred and eight pence,” and so on.\(^{17}\) For present-day historians, however, these pithy statements by Andrews can serve as starting points for research.

There are two important articles regarding the nomenclature of early American currencies. “The Archaic Monetary Terms of the United States” (1907), by Charles A. White, is key for understanding how the use of Spanish-American currency evolved in the different regions of the United States. Not only does White discuss the socio-economic aspects of this evolution, but also satisfactorily explains the correlation between the value of the foreign coins and the colloquial name of those coins in each region of the country. Similarly, “The ‘Picayune’: From Colonial Coin to Current Expression,” (1962) by Jerah Johnson traces how the Spanish-American half-real coin earned the name “picayune,” then how that name spread to city names, newspaper titles, and anything meaning small or worthless.

An important text on the United States dollar and its origin is *A History of the Dollar* (1957), by Arthur Nussbaum. This book offers a digestible history of the United States monetary system, from its pre-origins to the modern era. Beginning with the earliest English settlers to the Americas, foreign coins play an integral role in the narrative that Nussbaum establishes. Nussbaum recounts how, long before the creation

\(^{17}\) Andrews, 142.
of the United States dollar, various foreign coins established themselves in the economy of what was to become the United States—especially Spanish-American silver coins, but also Portuguese, French, and Venetian gold coins in the seventeenth centuries.\textsuperscript{18} His discussion on the overall importance of foreign coins falls short once his discussion of United States coinage begins. He does note, however, that “foreign coins were still in use, and several enactments regulated, although not consistently, their legal tender quality. Spanish-American coins, of course, were in the forefront,” and also mentions that “retail prices were fixed in amounts like \(6\frac{1}{4}, 12\frac{1}{2}, \) and \(18\frac{3}{4}\) cents, a practice applied even to postal rates and local paper money.”\textsuperscript{19} Like Hepburn, Nussbaum wrote within a particular historical moment, and concludes that “the recent internationalization of the dollar is probably the most important event in its history. That evolution was not brought about by any kind of American imperialism but by an inevitable development serving all nations concerned. It has created a monetary alliance among the non-Soviet nations. They all are profiting from it.”\textsuperscript{20} With a Cold War mentality, and hoping to historically establish the United States dollar as the preeminent monetary system in the world, it comes as no surprise that Nussbaum would choose to minimize the role that foreign coinage had played in the fledgling United States economy.


\textsuperscript{19} Nussbaum, 63.

\textsuperscript{20} Nussbaum, 229–230.
In these books, and many that followed, the historiography of money in the United States has largely revolved around economic history, and specifically around federal and private efforts to control money and monetary policy. More recent works, too, have largely avoided the cultural turn, and still offer a top-down history. Richard H. Timberlake, in *Monetary Policy in the United States* (1993), for example, focused on “the economic and political circumstances, events, and ideas that have led to the practice of positive, progressive, and discretionary government control of the United States monetary and banking system.”

This book fails to mention one of the greatest struggles that the federal government faced—achieving discretionary control of foreign coinage—and ignores the individuals who actually used the currency in circulation. Overall, Timberlake neglects metallic currencies and pays no attention to the presence of foreign coinage in the United States despite their legal tender status. Despite its title, in *The Power ‘To Coin’ Money* (1992), historian Thomas Wilson similarly focuses on how the government slowly modified its definition of money to include paper currency. The work attempts to explain how and why paper money became a legal form of currency, and emphasizes the monetary circumstances or outcomes of three historical events: the First Bank of the United States, the Civil War, and the Great Depression.

Jonathan Chu, in *Stumbling towards the Constitution* (2012), briefly discusses the importance of Spanish-American silver in the early United States economy, but in an institutional fashion rather than through the kind of social history that this dissertation offers. Once his narrative reaches the post-Revolutionary era, Chu focuses

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21 Timberlake, xix.
on the Bank of America and its role in monetary stability. The book ends with a
discussion on the establishment of the United States Mint. Chu seems to assume that
the period from 1776 to 1785 was when the United States government rid the nation of
the foreign circulating medium. He ignores the fact that they circulated for another
seventy five years, the period on which this dissertation focuses. In *From the Silver
Czech Tolar to a Worldwide Dollar* (2013), Petr Vorel concentrates on the Germanic
origins of the dollar, ignoring the impact that the Spanish-American dollar had on the
present-day dollar. Vorel does note that the United States began to use the word
“dollar” before Great Britain, and briefly recounts the Coinage Act of 1792 that
authorized the United States Mint, but he too seems to assume that this was the end of
foreign coinage circulation. Carlos Marichal, in “The Spanish-American Silver Peso:
Export Commodity and Global Money and the *Ancien Regime, 1550–1800*” (2006),
devotes a mere two sentences (without a footnote) to their circulation in the United
States:

> The monetary law ratified by the U.S. Congress on April 2, 1792, established that the metallic currency would be the silver dollar and that it would be equal in value to the silver peso of eight *reales*. In fact, it may be recalled that, in practice and law, the Mexican silver peso remained legal tender in the United States until the mid-nineteenth century.²²

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Although dealing with the specific topic of foreign coinage in the United States, *Spanish Dollars and Sister Republics* (2017) by Tatiana Seijas and Jake Frederick offers an international history of one type of coin by discussing a few key national figures of the United States and Mexico, and how these well-known figures affected the circulation of Spanish-American silver in what is now the American Southwest. According to Seijas and Frederick, the key individuals in this narrative included Congressman John Page, Samuel Houston, Antonio López de Santa Anna, and Emperor Maximilian I of Mexico. Instead of highlighting the consumers and merchants who actually used these coinages, each chapter by Seijas and Frederick focuses on “a protagonist who thought deeply about the role of money in building a nation.” While the approach certainly has value, it is not the approach that this dissertation takes.

*A Nation of Counterfeiters: Capitalists, Conmen, and the Making of the United States* (2007), by Stephen Mihm is among the most recent works on counterfeit currency, and links the widespread production of spurious banknotes to the success of key aspects of American culture and history. A primary difference between Mihm and this dissertation is the currency under consideration. Mihm studies banknotes, while this study tackles gold and silver coinage—both of which contained inherent complexities and confusions. According to Mihm, an ineffective federal government with no control over the circulating medium of the nation resulted in overabundant amounts of paper currency—both genuine and counterfeit—and did not rectify the

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situation until Congress passed the National Bank Act of 1863. The present study complicates this perspective by situating the 1840s and 1850s as a *laissez-faire* period of government concerning private banks—a result of the Panic of 1837. A deliberate move away from banks, and not a disability in regulation, caused the government to instead focus on gold and silver over paper. The primary reason for this was the legal status of coinage. Upon founding the United States Mint and monetary system through the Coinage Act of 1792, Congress established gold and silver coinage as the only form of legal tender for payments of all kinds within the United States. Paper currency did not enjoy such privileges. Of all the gold and silver in the United States, bankers impounded a fraction into the banking system and reissued a corresponding value in paper currency. Of the paper currency in circulation, counterfeit pieces also comprised but a fraction. Lastly, the results of the Coinage Act of 1857 and the National Bank Act of 1863 reveal extremes in their levels of success. Today, finding a foreign coin circulating in most parts of the United States is rare, yet millions of dollars’ worth of counterfeit paper currency continues to pass every year. One could say that the United States is still *a nation of counterfeiters*.

Historian Emily Gilbert presents the most modern and social framework for historians to focus on money. Disillusioned by earlier theories of money as set forth by Karl Marx, Georg Simmel, and Max Weber, Gilbert exposes several pitfalls of viewing money as a “universal equivalent,” “signifier of modernity,” or “shared symbolic language.”²⁴ Still prevalent in present-day scholarship, these understandings relegate money to a mere function of economic exchange; assume that money follows

a singular, natural evolution; and leave basic questions unanswered: Who creates money? How does it circulate? Gilbert suggests that network theories of money offer a better understanding to how economic actors—whether individuals or groups—define the value of currency. No longer living in an age when money holds intrinsic value through metallic content, why do people still have faith in otherwise worthless currencies? How does money gain acceptance within a society? Ultimately, what is money? By “drawing out the paradoxes of money as always a symbolic referent, a social system, and a material practice,” Gilbert urges historians of money to situate particular currencies within time and space.26

Gilbert provides three frameworks recently employed by postmodern historians that have advanced the understanding of money. First, Gilbert relishes the “special attention [paid] to the social networks that are needed to sustain monetary transactions, and to the role of trust in these networks”—that money is a social agreement rather than symbolic structure.27 In this context, the economic and social credibility of money derive from a promise of value by the individual giving the money and a degree of trust from the individual receiving the money. For as long as a

25 Gilbert, 366.
26 Ibid., 361.
27 Ibid., 366–368. Gilbert examines Geoffrey Ingham and the “social relation of credit-debt”; Mark Granovetter and the importance of trust and malfeasance; Viviana Zelizer and earmarked purposes of specific currencies, which push boundaries as to what constitutes “money”; Nigel Dodd and attempts to “understand principles that are intrinsic to monetary systems”; Andrew Leyshon and Nigel Thrift and the actor-network theory that gives agency to people, the money they put in circulation, and the networks that result.
currency can maintain its agreed upon social value, it will circulate under most circumstances. Next, Gilbert turns to scholarship that focuses on inscriptions and iconographies of physical currencies. Money-issuing institutions consciously employ mottoes and images to relay the history, identity, and function of the money and institution at hand. These include the portrayal of national heroes or emblems, symbolic mottoes, authorizing decrees, institutional names, proposed values, and conditions of use. Further, Gilbert argues that repeated exposure to recognizable currencies allows for their social acceptance and continued circulation; they become “naturalized.” Although Americans did not consider King Charles III of Spain a national hero, his image on Spanish-American dollars was a familiar symbol of money. When they saw his image, they immediately could recognize the coin for what it was worth. Gilbert concludes that historians who “emphasize the production of new money forms at particular historical moments” come closest to situating money in time and space. This framework allows historians to focus on the authority vested in creating money and monetary networks. Although most of this scholarship engages

28 Gilbert, 373. Gilbert examines Simon Smelt and money as a symbol; Fabio Mugnaini looks at the different types of information found on money; David Blaazer finds paper money to be the “‘traditional’ marker of national identity” in Great Britain; and Christina McGinley looks at the formation of national and gendered identities on 19th-century United States coinage.

29 Ibid., 375.

30 Ibid., 377. Gilbert examines her work with E. Helleiner on the formation of a Canadian national currency; Wambui Mwangi and the failures of the London-based East African Currency Board in instituting a colonial currency; Robert J. Foster and attempts by the Australian government to educate inhabitants of Papua New Guinea “a new way of thinking about money.”
with national currencies, non-official monies—such as privately-issued tokens, labor and prison scrips, gambling chips, food stamps, and even coupons—also impact the monetary supply of any given location. Official and non-official issues, together, create the interwoven networks of currency that constitute a monetary system, and offer historians nearly-inexhaustible examples to draw from.\textsuperscript{31}

Unlike the historiography of money in the United States, historians of consumption tend to approach the topic through a social history framework. Instead of exploring official institutions that dictated the operations of businesses, historians of consumption often examine the people or groups of people who consume, the objects they have consumed, and their motives for consumption. For example, David Jaffee, in \textit{A New Nation of Goods} (2010), uses the processes of consumption to examine “the cultural work of nation-building that occurred in towns across the northeast.”\textsuperscript{32} To meet this aim, Jaffee focuses on an array of objects that many late-eighteenth and nineteenth-century middle-class Americans indulged in: family paintings, globes, books, clocks, chairs and cabinets, and daguerreotypes. For Jaffee, these items exemplified “American” material culture for this period. \textit{The Morality of Spending} (1985), by Daniel Horowitz, follows a similar trajectory, but with a different outcome. Beginning his historical narrative in the period where Jaffee concluded, Horowitz argues that late-nineteenth and early twentieth-century Americans often viewed consumption as a moral problem. Where Jaffee finds Americans conceptualizing

\textsuperscript{31} Ibid., 368.

America through their consumption, Horowitz finds angst over the self-indulgence that many American consumers had demonstrated, as well as “the consequences of comfort, affluence, and luxury.”33 For both Jaffee and Horowitz, however, consumption was a fact of American life.

The historiography of consumption has ignored the methods that early American merchants used in order to properly operate a store, or to make day-to-day purchases. Historians only begin to focus on how the processes of retail operate with studies on department stores and more recent trends, from the 1840s to the present, with most studies covering the period after the American Civil War. Key texts that fit this description include “The Department Store” (1980) by Gunther Barth; *Timothy Eaton and the Rise of His Department Store* (1990), by Joy L. Santink; and *From Main Street to Mall* (2015), by Vicki Howard.34 Each of these works, while well-researched and essential texts on the topic, primarily discuss developments that occurred in the second half of the nineteenth century and into the twentieth. This dissertation will focus on an earlier, understudied period of merchants and consumption in the United States. The late-eighteenth, up through the mid-nineteenth centuries were a formidable period in the methods and procedures that American


merchants adopted. This included the need and ability to be able to operate successfully under a chaotic monetary system.

The period under consideration was important for standardization, not just of the United States monetary system, but for many aspects of everyday life in the United States and (in some cases) the world. Ranging from nuts and bolts to food and music, a range of objects and concepts experienced a degree of standardization that removed them from 18th-century outbuildings and workbenches, and into factories and machine shops. Key texts in the historiography of standardization include *From the American System to Mass Production, 1800–1932* (1984) by David Hounshell; *How Nations Choose Product Standards and Standards Change Nations* (1997) by Samuel Krislov; and *Regulating Railroad Innovation* (2002) by Steven W. Usselman. These and most other works that deal with standardization focus on products and the production process. And, like many other topics in United States history, the history of the railroad plays a key role in the historiography of standardization. Usselman was not the first to write on the subject of railroad gauge standardization. More recent works include *American Railroads in the Nineteenth Century* (2003) by A.J. Veenendaal, and *Tracks Across Continents, Paths Through History* (2009) by Douglas J. Puffert.

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work on standardization of Ken Alder is especially pertinent to the third chapter of this
dissertation on counterfeit coinage, scales, and weights. Alder’s work focuses on the
evolution of weights and measures under the monarchy, when more than 250,000
different units of measurements existed in France, often changing from town to town.
This, however, changed after the French Revolution, when the newly formed First
Republic took a very active role in the standardization and decimalization of all things
numeric.37

While this dissertation adds to the historiography of standardization, it
broadens the scope of the topic. Without question, the innovations that are well-
covered by historians were integral to the historiography of standardization. The
addition of 18th- and 19th-century monetary affairs, however, reveals the depth of
interest that the United States government had in standardization since its foundation.
As demonstrated in the works of J.G. Landels and John Perry, governments have
played important roles in the creation of standards, and have used their authority to
enforce the use of those standards.38 There are few objects throughout history where
this is more apparent than in the legal and physical creation of coins.

The first chapter of this dissertation also contributes to the historiography of
education in the United States, specifically in the study of mathematics. The role of
money in everyday life played a major role in teaching arithmetic to students through

37 Ken Alder, The Measure of All Things: The Seven-Year Odyssey and Hidden Error

38 See J.G. Landels, Engineering in the Ancient World (London: Chatto and Windus,
1978), and John Perry, The Story of Standards (New York: Funk & Wagnalls


often made it into the contracts of apprentices.\textsuperscript{43} Robert Garson, in “Counting Money” (2001), has dealt particularly with the role of money in the education of 19\textsuperscript{th}-century Americans.\textsuperscript{44} Much like Edward W. Stevens, Jr., Garson sees the education of American consumers and merchants as the key component in the success of 19\textsuperscript{th}-century United States. Garson, however, roots his argument in the need to understand how monetary conversions and exchanges were necessary functioning as a competent American. The first chapter of this present work is akin to “Counting Money,” but focuses on the role of foreign coinage in education.

This dissertation expands on each historiography, brings an element of social history to the study of money, and elaborates on the complexities that individuals faced when purchasing goods. It focuses on money as material culture and on the daily processes and improvisations that consumers and merchants followed in order for that form of currency to properly circulate. By focusing on how colonial Americans and citizens of the early Republic thought about, worked with, and understood money, historians can begin to better understand the difficulties that these individuals faced every day as they attempted to provide substance and sustenance for themselves and their families. Furthermore, present-day Americans can appreciate the simplicity that is the national monetary system—one that consists essentially of four coins (1¢, 5¢, 10¢, and 25¢) and five pieces of paper currency ($1, $5, $10, $20, and $100).

\textsuperscript{43} Carole Shammas, “Child Labor and Schooling in Late Eighteenth-Century New England: One Boy’s Account,” \textit{The William and Mary Quarterly} 70, 3 (July 2013): 539–558.

\textsuperscript{44} Garson, 21–46.
Figure 2    The three different types of Spanish-American eight-reales coins, known as dollars in British-American colonies. (top) Eight reales of Philip V, ca.1700–1728, Mexico City, known as a cob; American Numismatic Society, 1964.198.2. (center) Eight reales of Charles III, 1771, Mexico City, known as a “pillar dollar”; American Numismatic Society, 1991.78.135. (bottom) Eight reales of Charles III, 1784, Mexico City; American Numismatic Society, 1947.47.136.
Figure 3  Copper halfpenny of George III, Great Britain, 1774; American Numismatic Society, 1949.65.44. Silver shilling of George II, Great Britain, 1739; American Numismatic Society, 1901.21.28. Gold guinea of George III, Great Britain, 1775; American Numismatic Society, 1901.21.29. Gold sovereign of George III, Great Britain, 1817; American Numismatic Society, 1905.57.429.
Figure 4  Gold 6,400 reis, Brazil, 1760, known as a “half joe” in the United States. This particular piece most certainly circulated in the United States in the late-18th century, as the New York silversmith Ephraim Brasher counterstruck this coin with his “EB” hallmark, as did Boston silversmith Thomas Pons with his “TP” hallmark. American Numismatic Society, 1968.136.1.

Figure 6  Coins of France following the Revolution. Silver 5 franc of Napoléon, France, 1812; American Numismatic Society, 1947.51.2. Gold 20 franc of Napoléon, France, 1813; American Numismatic Society, 1966.164.465.
Chapter 2

ARITHMETIC, ALMANACS, AND ACCOUNT BOOKS:
18TH- AND 19TH-CENTURY APPROACHES TO RECKONING FOREIGN
COINAGE IN THE UNITED STATES

Figure 7 Complicated, yet realistic example of monetary conversion in
arithmetic textbook. Nicolas Pike, A New and Complete System of Arithmetic
Composed for the Use of the Citizens of the United States (Worcester, MA: Isaiah
Thomas, 1797), 63.

This exercise from A New and Complete System of Arithmetic (1797) by
Nicholas Pike demonstrated a complicated yet realistic example of the knowledge
required for consumers and merchants to circulate foreign coinage between one
another. [See Figure 7]. It not only showed the range of coinage in circulation, but that
sometimes it was necessary to convert one foreign currency for another, such as
Spanish pistoles into Portuguese half joes, rather than always into dollars and cents.
The example-coins used in the question were strikingly similar to the real coins used
in the transaction between Thomas Shields and Joseph Sturgis in December 1776—the
account-book entry that introduced this dissertation. [See Figure 1]. Transactions that
included physical coinage generally depended on the types that were available at a
given time and place, which were largely contingent on the whims of international
commerce. Both consumers and merchants needed to keep themselves abreast of the
methods used to convert one currency into another in order to competently conduct
business. Under such circumstances, how did individuals navigate this system? How
did they learn to do so? What aids did they need?

Starting before Independence and continuing until 1857—when the federal
government removed legal tender status from foreign coins—American consumers
and merchants went to great pains to understand the value of their foreign money.
Through the use of now obscure mathematical formulas and rules, they navigated a
complex monetary system. The main function of these aids was to convert the various
types of foreign coinage that circulated in the United States into a unit of account that
they understood. In 1784, Thomas Dilworth noted that the fundamental success of a
commercial society correlated to “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.”45 Individuals who received a well-rounded education learned to
comprehend specific and complicated functions of currency at a relatively early age.
Practical and useful, this knowledge became a part of the economic toolkit of
American consumers and merchants as they purchased and sold goods and services.
By the time these individuals began to participate in the local, national, or

45 Thomas Dilworth, The Schoolmaster’s Assistant: Being a Compendium of
Arithmetic both Practical and Theoretical (Philadelphia: 1784), in Garson, “Counting
Money: The U.S. Dollar and American Nationhood, 1781–1820,” Journal of
international economies, they were adept in understanding the exchangeable nature of money. Both consumers and merchants reinforced this knowledge with up-to-date information found through a variety of sources, such as almanacs, commercial directories, and ready reckoners.

A Common Unit of Account

A primary goal in the exchange of foreign coinage was to convert it into an understood unit of account (or money of account). This process served as a means to translate the abstract element of money into an exchangeable material object. On a practical level, a unit of account allowed consumers and merchants to assign a specific value to a piece of money. This was especially important in an age when most units of account correlated to a specific weight of a particular fineness of gold or silver. Consumers and merchants strove to use similar units of account to measure commercial transactions in any given place and time. Examples of units of account include French francs, British pounds, or United States dollars. The names of each type of currency enabled consumers and merchants to recognize they spoke in like terms. This was—and always will be—a defining and useful quality of money. In 1875, British economist William Stanley Jevons famously theorized that money had three functions: as a store of value, a medium of exchange, and a common unit of

46 The name for a unit of account and for a physical currency are not necessarily always the same (i.e. “United States dollar” for both the unit of account and the physical currency). For example, the present-day unit of account in China is the renminbi, though the unit currency is the yuan. Most of the time, however, the two are the same.
account. If money (value) was to properly circulate (exchange), everyone within any given economic sphere needed to agree on well-defined terminologies (unit of account) to cohesively unify the money in circulation. This was true even when—or, perhaps, especially when—the physical coinage supply did not necessarily conform to the accepted unit of account. Such was the case with much of the coinage that circulated in 18th- and early 19th-century America. Consumers and merchants did not need physical United States dollars to think in United States dollars. The 1772 edition of the *Encyclopedia Britannica* supposed, “Were pounds sterling, livres, florins, piastres, &c…invariable in their values, what a facility would it produce in all conversions, what an assistance to trade!” Unfortunately for merchants and consumers of this period, the many units of account that circulated were not invariable in their value, hence they needed to convert any foreign coinage received into one that was familiar.


Through the turn of the 19th century, consumers and merchants in the Mid-Atlantic States and New England witnessed a transition in the common unit of account: from pounds-shillings-pence to the United States dollar. While the Confederation Congress of the United States (under the Articles of Confederation) enacted the decimalized dollar as the unit of account on July 6, 1785, it took several years for merchants and consumers to follow suit. Historian Robert Garson attributes this to “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.”  

A decisive turn from pounds and shillings to United States dollars as the primary unit of account by private individuals occurred between 1795 and 1810.  

Edmund Baker, physician and chocolate-maker from Dorchester, Massachusetts, for example, changed the headings of his accounts from “£ / s / d” (pounds / shillings / pence) to “Dolls / Cents” on November 26, 1795. [See Figure 8]. Although most individuals completely amended their customs for computing money during this fifteen-year period, others could not fully commit. The account book of Zaccheus Atwood, clothier and farmer of Barre, Massachusetts shows this. Having learned his accounting skills while pounds-shillings-pence acted as

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49 Garson, 43.

50 From a survey of account books, daybooks, ledgers, and receipt books kept by 134 different individuals and small businesses. These sources are held in the Joseph Downs Collection of Manuscripts and Printed Ephemera at the Winterthur Museum, Garden & Library.

51 Edmund Baker, *Account Book*, The Joseph Downs Collection of Manuscripts and Printed Ephemera at the Winterthur Museum, Garden & Library, Folio 166. This was the earliest example observed in the course of research.
the sole unit of account, Atwood began to transition to United States dollars as early as November 1797, but habitually alternated between the two. Atwood’s accounts for Benjamin Stone began in 1804 in dollars and cents, but by 1809 had transitioned back to pounds-shillings-pence. By 1815, Atwood carried most of his accounts over to the United States dollar, but used the former method as late as March of 1824 for the account of Dene Babbet.\(^{52}\) Despite such anomalies, by 1810 most consumers and merchants in the Mid-Atlantic States and New England had abandoned pounds-shillings-pence as the common unit of account and fully reckoned their transactions in United States dollars and cents.

This need for a common unit of account appeared in the payment that Joseph Sturgis made to Thomas Shields. For example, even though Sturgis paid Shields with coinage from four different monetary systems, the latter converted each of them into pounds and shillings—the common unit of account during that period. This was necessary in order for the two of them to fully agree upon the sum. When he calculated their total, Shields stated that the six half-Johanneses—the British-American nickname for a Portuguese-Brazilian gold coin—he gave to Sturgis were valued “@ £5. p piece,” or five pounds each.\(^{53}\) In Brazil, the coins had a value of 6,400 reis—a value that likely made no sense to Shields and Sturgis. However, in terms that consumers and merchants from the Mid-Atlantic States and New England understood, those six coins had a total value of 30 pounds (£30). Similarly, Shields valued the 20 whole dollars at 11 shillings, three pence each (11s.3d.), for a total of 11

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\(^{53}\) Shields, 69.
pounds, five shillings (£11.5s.). To complete the transaction, he converted the other coinage into pounds and shillings until they reached the agreed upon 75 pounds, three shillings, and nine pence (£75.3s.9d.). Understanding such conversions proved crucial to receiving payments where the circulation of foreign coinage was such an inconvenience. This came naturally to neither merchants nor consumers. In order to claim commercial success and fully recognize the value of their money, each of them had to learn and comprehend some difficult mathematical concepts.

Sources of Knowledge

Arithmetic textbooks exposed many young Americans to these sorts of complex monetary conversions. Initially, colonial Americans imported English, Scottish, and Irish arithmetic books until the 1780s, when publishers in the United States began to print domestic works. These earlier works included *A New Treatise on Practical Arithmetick* (1712), by Humphry Johnson; *Complete System of Practical Arithmetic* (1773), by Thomas Sadler; and *The Scholar’s Guide to Arithmetic* (1795), by John Bonnycastle.54 According to the New England Historical Society, *The Schoolmaster’s Assistant* by Thomas Dilworth dominated the teaching of arithmetic and monetary education to young Americans. By the start of the Revolution, the book had gone through six editions. However, since it was “very British indeed” and used classic British anecdotes and examples to help students understand, it quickly fell into

disfavor in the new republic. American publishers tried to “Americanize” the text, but this was to no avail. Historian James N. Green finds that, even after independence, imported books continued to dominate the American market until around 1800, when they began to recede in earnest. The Embargo of 1808 and the War of 1812 damaged this market even further, and by 1820, American merchants and consumers relied nearly entirely on domestically-published texts.

The earliest-known arithmetic book printed in the British-American colonies—Arithmetic: Vulgar and Decimal—appeared in 1729, likely (albeit anonymously) by Isaac Greenwood of Harvard University, but it was not printed in large quantities, and only three copies exist today. Without question, Nicolas Pike’s A New and Complete System of Arithmetic Composed for Citizens of the United States was the first domestically-published arithmetic textbook to influence a wide audience in the monetary affairs of the country. First published in 1788, it received constant updates and republished well into the 1850s, long after Pike’s death in 1819, and was thereafter updated by Chester Dewey. In 1793, Pike compiled a condensed version of his text, with more focus on education in how to reckon money: An Abridgement of the New and Complete Arithmetic Composed for the Use, and Adapted to the Commerce of the Citizens of the United States for Use of Schools. Pike was Harvard-educated, so both books enjoyed endorsements from his alma mater, as well as from


Dartmouth and Yale, which helped ensure their place within the early American education system. By the mid-19th century, *Pike’s Arithmetic* (as most knew the book) enjoyed the highest acclaim among math texts throughout the country. As late as 1846, Eliphalet Nott, president of Union College, stated that “*Pike’s Arithmetic* is too well known and too highly appreciated to require any recommendation.”57 According to mathematician E. Roscoe Sleight, perhaps the most useful portions of this text in terms of monetary knowledge were the various charts, bearing such titles as “Rules and Tables for Reducing the Federal Coin,” “Table of English and Portuguese Gold in Dollars, Cents, and Mills,” and “Weights of French and Spanish Gold in Dollars, Cents, and Mills.”58 Of the 352 pages in the 1804 edition, fully 150 pages are dedicated to various concerns associated with money in the United States.

Americans could obtain these arithmetic texts through a variety of sources. One of the most successful was the Irish-born publisher Mathew Carey, who not only printed and sold texts but imported them as well. Active in Philadelphia from 1785 until his death in 1839, Carey was instrumental in the dissemination of a wide variety of textbooks throughout the early Republic. In his catalog for August 1792, Carey listed six arithmetic textbooks for sale.59 He did not include the entire title of the

57 Charles Billing Smith, *The Philosophy of Reform in Which are Exhibited the Design, Principle and Plan of God for the Full Development of Man, as a Social, Civil, Intellectual and Moral Being; Thereby Elevating Him in the Scale of Being to the Position He was Created to Occupy* (New York: Gates and Stedman, 1846), advertisement (357).


books, only the surname of the author and the subject. These included *Bonnycastle’s Arithmetic*, *Fisher’s Arithmetic*, *Gough’s Arithmetic*, *Hill’s Arithmetic*, *Serjeant’s Arithmetic*, and *Pike’s Arithmetic*. Four of these were published in London, *Hill’s Arithmetic* in Edinburgh, Scotland, and *Pike’s Arithmetic* in Boston. In his January 1793 catalog, Carey offered nine books on arithmetic, of which only two originated from the United States: *Pike’s Arithmetic* and *American Youth: Being a New and Complete Course of Introductory Mathematics, Designed for the Use of Private Students*, by Consider and John Sterry of Preston, Connecticut, published in Providence, Rhode Island. Through the mid-19th century, the number of arithmetic books available grew exponentially. From 1821 to 1857, according to F.L. Wren and H.B. McDonough, publishers produced 195 different textbooks on arithmetic in the United States.

Arithmetic books were an investment, and prices rose due to inflationary measures and a shift toward books published in the United States. In 1765, Boston bookseller John Mein listed only one arithmetic book for sale: *Cocker’s Arithmetic*. This textbook cost a mere 1½ shillings. In 1791—contending with post-Revolution

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62 John Mein, *A Catalogue of Mein’s Circulating Library: Consisting of Above Twelve Hundred Volumes, in Most Branchest of Polite Literature, Arts and Sciences* (Boston: 1765), 42. Written by Edward Cocker, Cocker’s Arithmetic was first published posthumously in 1677, London, and reprinted more than 100 times over the course of 150 years.
inflation—Mathew Carey offered *Pike’s Arithmetic* for 14 shillings (equivalent to $1.87), more than nine times the earlier price.63 In the same catalog of books for sale, Carey offered the American edition of *Gough’s Arithmetic* for six shillings (equivalent to 80 cents).64 This price difference between these two texts also reveals itself in the catalog of books for sale by Isaiah Thomas of Worcester, Massachusetts. In 1801, Thomas offered *Pike’s Arithmetic* for $2.25 (or 87½ cents for the abridged version), while *Gough’s Arithmetic* cost only one dollar.65 By the mid-19th century, prices stabilized. In 1847, for example, booksellers Gates and Stedman of New York City offered the most current edition of *Dewey’s Pike’s Arithmetic* for $1.25, while Thomas Davis, of Philadelphia, offered slightly older versions of *Pike’s Arithmetic* for a bargain price of 22½ cents.66

Eventually, the cost of books influenced the way students learned from arithmetic textbooks. Through most of the first half of the 19th century, according to Paul C. Burns, students who attended schools learned arithmetic and monetary

63 *The American Museum, or Universal Magazine* (November 1791), advertisement.

64 Ibid. While originally published in Dublin, the American edition of *Gough’s Arithmetic* was subsequently “altered” by B. Workman and republished in Wilmington, Delaware.


66 Alexander V. Blake, compiler, *The American Bookseller’s Complete Reference Trade List, and Alphabetical Catalogue of Books Published in this Country, with the Publishers’ and Authors’ Names and Prices Arranged in Classes for Quick and Convenient Reference* (Claremont, NH: Simeon Ide, 1847), 30, 72. Davis’s price of 22½ cents was for a copy in imitation leather. For a copy with genuine leather, the price was 25 cents.
calculations from a single textbook, owned by the teacher. The titles of some arithmetic books reflected this trend, such as *The American Tutor’s Assistant...Adapted for the Easy and Regular Instruction of Youth in the United States* (1802), or *The Schoolmasters Assistant* (1797). Some textbooks even corroborated this method of instruction, such as *Colburn’s Arithmetic*, which opened with an introduction on oral instruction. Joseph T. Buckingham, a student in New England in the early 1790s, recalled that “the teacher and one of the eldest boys had each a copy” of *The Schoolmaster’s Assistant*, by Thomas Dilworth. Edward W. Stevens, Jr. argues that “arithmetic instruction, including its application in coinage and mensuration, was in a sorry state” due to the lack of textbooks. According to Walter S. Monroe, the teacher dictated sets of sums or math problems to students who would work on them on their own, and then take them to the teacher for approval (or disapproval). Burns suggests that the earliest arithmetic text specifically written for

67 Burns, 429.


71 Stevens, 87.

use by American students was *First Lessons in Intellectual Arithmetic* by Warren Colburn in 1821. This development intended “to lighten the workload of the master and to conserve pupil time.”

The ownership of textbooks by students was not commonplace until the mid-19th century.

Prior to this change in method, individuals created *cyphering books*—hand-written manuscripts—that emulated the textbook of the teacher. Students would work on their sums on pieces of scrap paper or a slate before confirming that they had the correct answer, then copy the question, their work, and the rule that led them to the correct answer into the cyphering books. As one student of Boston public schools, ca. 1810, recollected, “no boy was allowed to cipher till he was 11 years old…and the writer never heard any explanation of any principle of arithmetic while he was at school.”

Sometimes, cyphering books were hand-made from a quire of paper, folded, and sewn together. Other times, students purchased blank books. In the Joseph Downs Collection of Manuscripts and Printed Ephemera at the Winterthur Museum, Garden & Library, for example, the 1795-cyphering book of Weeden Rider, from Rensselaerville, New York was clearly homemade, while John Eckman, of Lampeter, Pennsylvania, clearly purchased his cyphering book, complete with a marbled hard cover and leather binding. With information added by its creator later in life, one can deduce that some schoolchildren kept their cyphering books into adulthood. In the total absence of textbooks, teachers even sometimes taught with their own cyphering books.

73 Burns, 429.

74 Stevens, 87.
Most instructors certainly directed the teaching of arithmetic and monetary calculations towards young, white men. When the subscribers to *A New System of Mercantile Arithmetic*, by Michael Walsh, examined the text in May of 1800, for example, they concluded that the book was “better calculated than any [they had] met with, to qualify young men for admission into Compting-Houses.”75 The titles of many texts corroborated this sentiment, such as *The Young Man’s Best Companion; The Young Gentleman’s Pocket Companion;* or *The Man of Business, and Gentleman’s Assistant*, to name a few.76 Upon completion of their instruction, these young men expected to know the foundations of operating a business in the United States, regardless of the profession they followed. A selection of 12 cyphering books located in the Joseph Downs Collection of Manuscripts and Printed Ephemera at the Winterthur Museum, Garden & Library highlights the wide range of professions that individuals chose after their education. These included a flour mill owner and operator, a teacher, a watchmaker, a farmer-turned-merchant, three general store operators, a career military man, an iron worker, a tanner, and a preacher.77

75 Michael Walsh, *A New System of Mercantile Arithmetic, Adapted to the Commerce of the United States, in Its Domestic and Foreign Relations; with Forms of Accounts, and Other Writings Usually Occurring in Trade* (Newburyport: Edmund M. Blunt, 1803), v.


77 Thomas Calwell, of Baltimore, a flour mill owner and operator; Thomas Earl, a school master in Burlington County, New Jersey; Jacob Heald, of Wilmington,
Despite this focus on young men, young women also partook in the exercise through early texts written specifically for them. They offered basic functions of arithmetic, including monetary calculations, but did not go beyond addition, subtraction, multiplication, or division. *The Accomplish’d Housewife, or the Gentlewoman’s Companion* (1745) did venture into compound addition and compound subtraction, posing simple questions such as, “If an Egg cost 3 Farthings, what is that for 120? *Answer 7s. 6d.*” The section on arithmetic closed by stating, “We shall not puzzle our Female Readers with any farther Forms of Arithmetical Calculations,” and made no mention of reduction or any other form of monetary calculation vital to and reflective of the true nature of currency conditions. Similarly, *An Introduction to Arithmetic Designed for the Use of Young Ladies* (1788) by William Butler and *The Young Lady’s Arithmetic* (1797) by David Kendal contained little more than basic questions of consumption. By the turn of the 18th century, Delaware, a teacher; Benjamin Ferris, also of Wilmington, a watchmaker; Oliver Filley, a farmer from Connecticut who eventually turned to trade after the Revolution; Oliver Hewlett, of Hempstead, NY; Godfrey Miller, of Winchester, VA; and Samuel Rex of Pennsylvania, general store operators; DeLancey Floyd Jones, of New York, a career military man; Robert May, an iron worker in Maryland; Michale Minnich, of West Hamburg, PA, a tanner; and Caleb Prentiss, a preacher in Boston.

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78 *The Accomplish’d Housewife; or, The Gentlewoman’s Companion* (London: J. Newbery, 1745), 120.

79 Ibid., 123.

according to Kim Tolley, the curricula taught in girls’ schools expanded greatly, and by 1820, most offered arithmetic as a part of their regular course offerings. This began to include more complex notions of monetary calculations and exchange. The Joseph Downs Collections of Manuscripts and Printed Ephemera at the Winterthur Museum, Garden & Library, for example, contains four cyphering books known to have belonged to women: Sarah Williams (dated 1771), Laura Beach (dated 1791–1808), M.S. Parker (dated 1797–1807), and Jane Debevoise (dated 1828). Each showed that these women learned the same arithmetical functions of money as young male students.

Despite the authorship, sales, and ownership of arithmetic textbooks, not all individuals received formal instruction in monetary conversions, and not everyone who did receive this instruction fully understood it. Historian Robert Garson went so far as to call it “rare.” In her discussion of Anna Green Winslow, a student from an upper-class family from New England during the 1770s, Carole Shammas notes how Winslow “read quite well, judging by the allusions to novels, but she never mentions studying arithmetic, a subject often neglected in girls’ education.” Shammas also discusses seventeen-year-old Benjamin Winslow, tutored by Philip Vickers Fithian in Boston during the same period. Benjamin, “the scholar of the family who planned to


82 Garson, 38.

83 Shammas, 554.
go on to college,” appeared to understand simple addition, subtraction, multiplication, and division, but could not yet fully grasp the concept of reduction, despite having studied with Fithian for nearly a year.\footnote{Ibid., 553.} Regardless of the amount of instruction received, or the level of comprehension, it was inevitable that these individuals would become a part of the commercial world and deal with the foreign coinage in circulation.

### The Various Modes of Conversion

Several methods existed for exchanging foreign coinage into a common unit of account, including reduction, the Rule of Three, and the Rule of Practice.

In 1808, student Laura Beach defined reduction in her cyphering book as a tool that “Teacheth to bring or change numbers from one name to another, without altering their value.”\footnote{Laura Beach, \textit{Exercise Book}, 1. The Joseph Downs Collection of Manuscripts and Printed Ephemera at the Winterthur Museum, Garden & Library, Document 607.} Monetarily, this involved breaking down a given amount of currency to the smallest denomination within its system (e.g. pounds and shillings into pence and farthings; or dollars into cents in the United States monetary system)—known as \textit{descending reduction}. Mathematician James Thompson defined this as the process wherein “great names are brought to small by Multiplication.”\footnote{James Thompson, \textit{The American Tutor’s Guide: Being a Compendium of Arithmetic} (Albany: E. & E. Nosford, 1808), 36.} In 1804, John Eckman, of Lampeter, Pennsylvania, for example, used this method to reduce 17 guineas into shillings and into pence. To do this, he multiplied his 17 guineas by 21

\footnote{Ibid., 553.}


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(the number of shillings in one guinea) to find 357 shillings (357s.). Next, he took 357 and multiplied that by 12 (the number of pence in one shilling) to find that there were 4,284 pence (4,284d.) in 17 guineas.\textsuperscript{87} \textit{Ascending reduction}, when “small names are brought to great by Division” (per Thompson), built currencies up from the lowest denominations to the largest—similar to modern-day simplification.\textsuperscript{88} \textit{Mixed reduction} (also spelled \textit{mixt}) was the combined use of descending and ascending reduction.\textsuperscript{89} Indeed, individuals used ascending reduction to prove descending reduction, and vice versa. Eckman, for instance, could have divided 4,284 pence by 12, and then again by 21 to simplify that amount back to 17 guineas.

Students used reduction to convert the various types of foreign coinage that circulated in the Mid-Atlantic States and New England into the desired unit of account. Laura Beach, for example, employed reduction in a variety of problems, such as, “In 37 half Johannes at 48s. [shillings] how many shillings sixpences & threepences?” and “In 38,720 farthings how many French Crowns at 6s.8d. each?” When asked, “In 7,467 Dutch guilders at 2s.3d. ea. How many Shillings, pence & farthings?” she first multiplied 7,467 and 2\(\frac{1}{4}\) (the number of shillings-per-guilder) to equal 16,800\(\frac{3}{4}\) shillings [See Figure 9].\textsuperscript{90} By multiplying that product by 12, she


\textsuperscript{88} Thompson, \textit{The American Tutor’s Guide}, 36.


\textsuperscript{90} Beach, \textit{Exercise Book}. 

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found the number of pence (201,609), and again by four, the number of farthings (806,436). To check her work, she first divided by four, then by three, then by nine (or four times two-and-a-quarter), to bring it from farthings, to pence, then directly into Dutch guilders. As is apparent, successful students and practitioners of reduction had to possess a healthy command of individual monetary systems. Beach, for example, needed to know that twelve pence equaled one shilling and that four farthings equaled one penny.

Several mathematicians offered rules especially for the reduction of specific types of foreign coinage into the United States dollar. In the 1808 edition of *New and Complete System of Arithmetic*, Nicolas Pike listed a series of mathematical formulas to convert nine different currencies into each other—which he called *rules for the reduction of coins.* Unlike the normal method of reduction, these rules allowed for merchants and consumers to use specific equations to convert from one currency to another, or—according to Pike—to find these currencies “each to the par of all the others.” Five of them converted foreign coinage: British, Irish, Canadian and Nova Scotian, French, and Spanish. Exchanging French livres, for example, meant multiplying the amount by four, then dividing by 21 to know their value in United States dollars. [See Figure 10]. Therefore, 10 French livres would have equaled about $1.90 \left(\frac{10 \times 4}{21} = 1.9\right)$. To convert the same number of livres into British sterling, Pike offers two formulas: multiply by six, then divide by seven \left(\frac{10 \times 6}{7} = 8.57\right); or subtract one-seventh of the amount \left(10 - \frac{10}{7} = 8.57\right). Either way, 10 French livres would have

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91 Pike, 98–109.

92 Ibid., 98.
equaled 8 shilling 6¾ pence. John McAllister, a mathematic-instrument maker from Philadelphia, must have had to convert dollars and cents to pounds and shillings fairly frequently. In the inside cover of his daybook that covered the years 1803 to 1805, he had handwritten, “How to bring Dollars to Pounds Sterling / Multiply by 2¼ double the Units in Dollars / & take the Cents as Pence & the Remainder / Left hand Figures will be Pounds Sterling.” [See Figure 11] He followed this with an example: $2127.20 \times 2rac{1}{4} = 478.62 \times 10 = £478.12.5.

However, when compared to the timeless processes of ascending and descending reduction, these strict formulas had a weakness: they could become grossly out-of-date at any time. They worked only with exact values between those specific currencies, and could become obsolete in two different ways. First, these values perpetually changed relative to one another. Thomas Dilworth mentioned this as a reason for not including these rules in his *Schoolmaster’s Assistant* of 1762. He noted:

I have omitted Reduction of Foreign Coins, partly because all those Tables, which I have met with, which shew the Value of Foreign Coins in English Mony [sic], are very erroneous; but principally because…the Value of Foreign Species (such I mean as relate only to Exchange) both of Gold and Silver, in every Country is unsettled, and therefore such Coins are subject to vary in their Prices, as the Merchants find and Opportunity to profit by them. Hence proceed the various Courses of Exchange…is sometimes more, sometimes less, according as the Course of Exchange runs at that Time when such Foreign Coin becomes due.94

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Money became particularly “unsettled” during periods of inflation. For example, when Joseph Sturgis remitted his payment to Thomas Shields in December of 1776, the War for Independence had cut commercial ties with Great Britain, the largest trading partner of the fledgling country. As a result, hard currency became more difficult to obtain and rates of exchange soared. If Shields had used the rule offered by Pike to convert his 20 whole dollars into pounds-shillings-pence (multiply by nine, then divide by 40), he would have come up with only four pounds, six pence, instead of the inflated 11 pounds, five pence.

The second situation when the rules for reducing coinage, as offered by Pike, could become obsolete was when a nation made any alteration to its monetary system. For example, by 1808, when Pike offered his formulas, the French Revolution had ended the millennium-long circulation of livres, and the First French Republic (1792–1804) authorized the new, decimalized French franc in 1795. While merchants and consumers could still find that French livres residually circulated in the United States—making the information still relevant—Pike did not offer a rule for French francs, which circulated in greater and greater numbers as years passed. Equally problematic, consumers and merchants could not convert all foreign coinage with these simple formulas due to rates of exchange that did not easily conform to simple rules, such as gold Portuguese half-johannes. Merchants and consumers needed to rely on traditional reduction to find exact values for these coins.

The reduction of money was common and integral to daily commerce through the first quarter of the 19th century. Many contemporary mathematicians considered it the first operation learned after the four basic types of arithmetic—addition, subtraction, multiplication, and division—and sometimes even included reduction with
those operations. Students studied them in this order before moving on to more complex operations. In the 1830s, once the majority of foreign coinage (except, largely, Spanish-American silver) ceased to circulate in the United States, this mathematical function slowly began to disappear from arithmetic textbooks. When the circulation of foreign coinage legally ceased in the United States with the Coinage Act of 1857, reduction was no longer necessary to operate within the monetary system. As arithmetic instruction evolved from “practical word problems” to the “science of numbers,” standard by the 1850s, many students no longer received training in reduction for daily commerce.

Another common method for exchanging currencies was the Single Rule of Three (also called the Rule of Proportion, or the Golden Rule). In July 1807, student Laura Beach learned that the Rule of Three “teacheth, by having three numbers given, to find a fourth, that shall have the same proportion to the third, as the second has to the first.” If $a$ is to $b$, then $c$ is to $d$. The first two numbers given are the terms of supposition, while the third is the term of demand. Two types of the Single Rule of Three aided consumers and merchants in the exchange of foreign coinage: Direct and Indirect (or Inverse). The former was for when the proportion increased (when the first term of supposition was larger than the term of demand, such as both of the above examples), while the latter was for a decreased proportion (when the first term of

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96 Stevens, 92.

97 Beach, Exercise Book.
supposition was larger than the term of demand). Equations generally followed an if-then format. The mathematical symbols for the Rule of Three were “:::” or “a : b :: c : x.” Putting word problems into this format simplified the matter and allowed for practitioners to better comprehend what the question asked.

For example, the 1810-edition of *Dilworth’s Assistant* posed the questions, “If 1 dollar be worth 56,3/5d. what are 500 dollars worth?” and “If 1 pistole be 17s.1/5s, what are 100 pistoles?”98 A student could use the Rule of Three to find the answers. Student Jacob Myers noted in 1806 that “if any of the given terms be of Several Denominations they must Be Reduced into the lowest Denomination mentioned.”99 This was only the case if, say, the question mentioned both pounds and shillings as the first term of supposition and the term of demand. From there, finding the answer is as easy as multiplying the second term of supposition and the term of demand, then dividing that sum by the first term of supposition to find the answer. Using mathematical symbols, Myers could simplify the first example above to “$1 : 56\frac{3}{5}d. :: $500 : x.”100 Multiplying $56\frac{3}{5}$ and 500 revealed 28,300, and since the answer was to match the second term of supposition, this represented 28,300 pence (28,300d.). Reducing that to pounds finds the answer of 117 pounds, 18 shillings, and four pence (£117.18s.4d.). Likewise, the second example given by *Dilworth’s Assistant* led to an


answer of 86 pounds (£86). In 1815, John Blake, mathematics instructor of Burlington County, New Jersey, offered a poetic verse to remember the function of the Single Rule of Three:

This golden rule has places three,
The first and third must so agree;
That of one kind they must remain,
If to the truth you would attain:—
   It has proportions also two,
As we direct shall plainly shew.101

Many considered mastering the Rule of Three as essential to commercial success. Author and teacher Lyman Cobb, for example, explained to his readers that the Single Rule of Three had “extensive usefulness in the solution of nearly every mathematical inquiry, and also in the transaction of business.”102 Throughout the 18th and early 19th centuries, apprenticeship was a primary method for young Americans to learn not only a trade, but also the mathematical workings of operating a business. As a result, many contracts of indentured servitude stipulated that the master—in addition to passing on his or her trade—teach the apprentice to “read, write and cypher as far as the rule of three.”103 This was a gendered and, to a lesser degree, racialized phenomenon. From a sample of 759 indenture records from Rhode Island, 1750–1800,

101 John Blake, 76.


103 The American Philosophical Society, Records of Indentures of Individuals Bound Out as Apprentices, Servants, Etc., and of German and Other Redemptioners in the Office of the Mayor of the City of Philadelphia (Lancaster: The American Philosophical Society, 1907), 10–11.
83.1% of white-male indentured servants or apprentices learned these skills, compared to 56.3% of Native American and African American boys, 2.7% of white girls, and 0% of Native American and African American girls.104 Throughout her extensive research, Hilary J. Moss identified only 19 different contracts that made the same stipulations for African-American apprentices in the early 19th century.105

Very similar to the Rule of Three, the Rule of Practice offered another means to finding the value of foreign coinage. In August 1807, student Laura Beach studied the Rule of Practice, and defined it as “a contraction of the Rule of Three Direct, when the first term happens to be an unit or one, and is a concise method of resolving most questions that occur in trade and business, where money is reckoned in pounds, shillings and pence.”106 Due to its simplicity of decimalization, several individuals, such as mathematician Oliver Welch, claimed that the Rule of Practice was “not so useful in the present currency of the United States as it was in the former currency.”107 Laura Beach also noted that “reckoning in Federal Money will render this rule almost useless”108 According to student Peggy Clayton, the Rule of Practice received its name due to its “quick and elegant dispatch of Business, & from their frequent use,”


105 Moss, 227.

106 Beach, Exercise Book.


108 Beach, Exercise Book.
while Edward Hatton added, “It is called the Rule of Practice because of its excellent Use in the Practice of Merchandize, for dispatching many Computations with much ease and in a short time.”\textsuperscript{109} The anonymous author of \textit{The Stranger’s Assistant} mentioned that the Rule of Practice is “the most useful rule in arithmetic (when well understood).”\textsuperscript{110} Understanding it, however, often proved difficult.

The Rule of Practice functioned as a hybrid of mental arithmetic and written arithmetic, in which the practitioner would need to memorize a number of \textit{cases}, but would then work out each problem through a written formula that imitated a particular commercial scenario. The number and order of the cases were rarely uniform. Edward Hatton offered seven cases; Nicolas Pike, 17 cases; while Laura Beach recognized 24 cases.\textsuperscript{111} An order of operations followed each that led to the correct amount. Some example cases offered by Pike included what to do when the rate of exchange was “an even part of one shilling,” in “pence, and no even part of a shilling,” or “an even part of a shilling, besides an even number of shillings under 20.”\textsuperscript{112} [See Figure 12]. In every case, this method used aliquot fractions of the desired monetary system in order to convert one type to the next. Explanations of the Rule of Practice nearly always began with a chart showing the fractional parts of a pound, of a shilling, and of a

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\begin{footnotesize}
\begin{enumerate}
\item A Citizen, \textit{The Stranger’s Assistant and Schoolboy's Instructor} (New York: George Forman, 1795), 127.
\item Pike, 151, 153.
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penny. These tables were integral to the proper function of the Rule of Practice and, according to student Peggy Clayton, were “to be well understood & got perfectly by heart.”\textsuperscript{113} As such, to use this rule, individuals needed to know that four shillings equaled one-fifth of a pound, or that 1½ pence was one-eighth of a shilling, to name a few.

With the memorized cases and tables of aliquot parts of currency, consumers and merchants could put the Rule of Practice to good use. For example, 18\textsuperscript{th}-century accomptant John Dean asked, “What Sterling will discharge a Bill of 579 French Crowns, at 4s. 6d. each?”\textsuperscript{114} To answer, Dean used mental calculations based on knowing that four shillings was one-fifth of a pound, and that six pence was one-eighth of a shilling. The symbol for the Rule of Practice was three vertical lines, with the given sum to the far right, the rate of exchange to the left, and the aliquot fraction in the center.\textsuperscript{115} [See Figure 13]. Calculating within this symbol, Dean then figured that one-fifth of 579 French Crowns equaled 115.8 pounds, or 115 pounds and 16 shillings (£115.6\textsuperscript{s.}). Next, he figured that one-eighth of one-fifth of 579 crowns equaled 14.475 pounds, or 14 pounds, nine shillings, and 6 pence (£14.9\textsuperscript{s.6d.}). He then added those two sums (£115.6\textsuperscript{s.} + £14.9\textsuperscript{s.6d.}) to find that 579 French Crowns equaled 130 pounds, five shillings, and six pence (£130.5\textsuperscript{s.6d.}).

\textsuperscript{113} Clayton, 74.

\textsuperscript{114} John Dean, \textit{The Rule of Practice Methodized and Improved} (London: G. Keither, 1756), 244.

\textsuperscript{115} Sometimes, however, practitioners used just one vertical line, with the given sum to the right of the line, and the rate of exchange and the aliquot fractions to the left. The single-line symbol seemed to appear most often through the mid- to late-18\textsuperscript{th} century, while the three-lined symbol was standard by the 19\textsuperscript{th} century. Dean, operating in the mid-18\textsuperscript{th} century, used the single-line symbol.
Simple algebra sometimes proved productive in exchanging currencies. In their mathematics textbook the *American Youth*, Consider and John Sterry posed the problem, when “I owe my friend a moidore, have nothing about me but crowns, and he has nothing but guineas: How must we exchange these pieces of money, so that I may acquit myself of the debt?”\(^{116}\) With the question, the Sterrys provided the exchange rates of a moidore, a crown, and a guinea, at 27, five, and 21 shillings, respectively. Using simple algebra, the answer to this seemingly difficult situation between friends became attainable:

Put \(x = \text{number of crowns, and } y \text{ the number of guineas: Then } 5x - 21y = 27 \) by the question: Or, \(x = \frac{27 + 21y}{5} = W N. \) But, \(\frac{27 + 21y}{5} = 5 + 4y + \frac{2 + y}{5}; \) consequently, \(\frac{2 + y}{5} = W N, \) and \(\frac{2 + y}{5} = n; \) or, \(2 + y = 5n; \) and assuming \(n = 1, \) we have \(y = 3, \) the number of guineas, and \(x = \frac{27 + 21y}{5} = 18, \) the number of crowns. Therefore, I must give my friend 18 crowns, and he must give me three guineas.\(^{117}\)

By simply “solving for \(x,\)” the Sterrys offered a viable method to solve a seemingly complex conundrum. Mathematician Benjamin Wardhaugh notes that, by the mid-19th century, algebra began to replace “verbal rules and case-by-case tricks,” such as the Rule of Three.\(^{118}\) The gradual disappearance of the latter for the former in many arithmetic textbooks supports this hypothesis.


\(^{117}\) Ibid., 380.

\(^{118}\) Wardhaugh, 32.
Rates of Exchange

Regardless of the method used to convert foreign currencies into United States dollars, each of them had one thing in common: the need for a rate of exchange. This rate was the amount of money that an individual could expect to receive for a given amount of another currency. The exchange rate always reflected the primary unit of account, in order for local consumers and merchants to understand. For example, as outlined above in the discussion on reduction, student Laura Beach answered the question, “In 7,467 Dutch guilders at 2s.3d. ea. How many Shillings, pence & farthings?”119 Without knowing that one Dutch guilder equaled two shillings, three pence (2s.3d.), Beach would not have been able to solve the problem correctly. The number of shillings and pence she could receive for one Dutch guilder proved vital to the outcome of the monetary conversion. Similarly, with the examples outlined in the discussions on the Rule of Three and the Rule of Practice—“If 1 pistole be 17s.1/5, what are 100 pistoles?” and “What Sterling will discharge a Bill of 579 French Crowns, at 4s.6d. each?”—the rates of 17s.1/5 and 4s.6d. revealed the exchange rates as integral information to find the correct outcome of the problem.120 As Garson notes, “Thus a good knowledge of conversion rates was vital to the exchange process,” and was “a vital mercantile tool.”121 Consumers and merchants needed to know this information to make daily exchanges of foreign coinage into domestic currency.

119 Beach, Exercise Book.

120 Gibbons, 153. Dean, 244.

121 Garson, 23, 43.
Consumers and merchants could find the annual assays and the current exchange rates from a variety of sources. Garson suggests that, although pocket-sized almanacs contained a lot of assorted information, the tables of exchange rates were the most useful to consumers and merchants.\textsuperscript{122} In 1852, regarding the value of foreign coins, the editors of \textit{The American Almanac} explained exchange-rate charts as “putting in a small space such a statement as would be satisfactory…to supply such information as dealers, amateurs, and legislators would from time to time be likely to require.”\textsuperscript{123} Considering the hodgepodge of information within such texts, the location of foreign-exchange charts varied from almanac to almanac. \textit{The American Almanac}, for example, printed the charts between the number of passengers that arrived to each state in the previous calendar year and the composition of state governments. \textit{The Farmer’s Almanack} placed their charts between a statement on untitled lands in the United States and the rate of postage by mileage.\textsuperscript{124} However, not all almanacs contained such charts.\textsuperscript{125}

Ready reckoners also carried foreign exchange-rate charts. A \textit{ready reckoner} was a sort of printed calculator that performed the simple task of multiplication. Most

\textsuperscript{122} Ibid., 43.

\textsuperscript{123} Charles C. Little and James Brown, editors, \textit{The American Almanac and Repository of Useful Knowledge} (Boston: Charles C. Little & James Brown, 1852), 225.

\textsuperscript{124} Robert B. Thomas, \textit{The Farmer’s Almanack} (Boston: Manning & Loring, 1800), 179.

of these books consisted of numeric charts. [See Figure 14]. The heading stated the price of a good or service, while the far left side listed the number purchased. The right side then stated the price for that quantity at the given price. Consumers and merchants who needed to know the price of a certain number of goods priced at nine cents, for example, could refer to page 30 of The Federal Ready Reckoner (1795). If that individual wished to purchase or sell, say, 35 objects, he or she could refer to that number to find that the price equaled $3.15. Ready reckoners generally began to calculate in mills—one-one thousandth of a dollar—and worked their way up to ninety-nine cents, sometimes higher. Until the first decade of the 19th century, some publishers issued ready reckoners that calculated in pounds, shillings, and pence. Generally, foreign exchange rates appeared at the end of the text. The Federal Ready Reckoner provided three charts for foreign exchange: to convert cents into pounds, shillings, pence, and farthing; to calculate the value of British and Portuguese gold coin into dollars and cents, as well as pounds, shillings, pence, and farthing; and to calculate French and Spanish gold coins into the same two currencies. Strangely, other large commercial books, such as the Commercial Directory and Hunt’s Merchant’s Magazine and Commercial Review, did not include foreign exchange charts.


127 Ibid., 124–126.

128 Commercial Directory: Containing a Topographical Description, Extent, and Productions of Different Sections of the Union, Statistical Information Relative to Manufactures, Commercial and Port Regulations, a List of the Principal Commercial Houses, Tables of Imports and Exports, Foreign and Domestic, Tables of Foreign
Newspapers served as another source for exchange rates. Tables tended to be located in the commercial sections of newspapers, such as the “Value of Foreign Coins, in Money of the United States,” in the Providence Patriot of March 17, 1819. Newspaper editors tended to situate foreign exchange charts in the back pages of newspapers, along with commercial news. Some newspapers printed the charts in the classified section, in line with advertisements for jobs, boarding houses, incoming cargo ships, or items for sale. The mass-produced nature of newspapers, however, sometimes led to errors in exchange-rate charts, such as the variety of errors in a gold-coin exchange rate chart that the National Intelligencer complained about in 1834. The newspaper blamed “the industrious compiler [for] a reliance on information through irregular channels” and noted that such errors “are not uncommon [and] indeed frequent.” As the book-publishing industry in the Mid-Atlantic States and New England flourished and the popularity of almanacs grew, exchange-rate charts disappeared from newspapers. By the 1830s, consumers and merchants in in the Midwest and western territories of the United States were more likely to find foreign-exchange charts in newspapers than their eastern seaboard counterparts.

For the most serious of merchants and traders in need of foreign exchange rates, The Universal Cambist, first published in 1811, fulfilled their requirements. The

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130 “Gold Coins,” Virginia Free Press (Charlestown, WV), July 24, 1834, 19th Century U.S. Newspapers.
two-volume set compiled by Patrick Kelly represented “a full and accurate treatise on
the exchanges, monies, weights, and measures of all trading nations and their
colonies.”\textsuperscript{131} \textit{Kelly’s Cambist}, as contemporaries often referred to it, included the
currencies and exchange rates for 325 different locations. The semi-annually published
texts also included brief historical sketches of the monetary systems. For example, the
\textit{Cambist} distinguished the coinage of Portugal between those stuck prior to 1722 and
after that date, and noted that the former held a 20\% rise in value due to a higher gold
content than the latter.\textsuperscript{132} Despite its publication in London, advertisements show that
various booksellers in the Mid-Atlantic and New England—such as F. Taylor of
Washington, D.C., Pishey Thompson, of the same city, and H.C. Carey & I. Lea of
Philadelphia—offered the set.\textsuperscript{133} The very useful texts were not cheap, as H.C. Carey
and I. Lea sold the 1825 edition for $14, while Pishey Thompson offered them for
$35.

\textbf{Accounting for Foreign Coinage}

Regardless of how a consumer or merchant learned to convert foreign coinage,
or where he or she retrieved exchange rates, account books served as ground zero for
the implementation of such skills. It was within the pages of account books that

\textsuperscript{131} Patrick Kelly, \textit{The Universal Cambist and Commercial Instructor} (London: P.
Kelly, 1821), front page.

\textsuperscript{132} Ibid., 210.

\textsuperscript{133} “Books from London,” \textit{The Daily Madisonian} (Washington, D.C.), March 5, 1845,
D.C.), October 14, 1825. “Kelly’s Cambist,” \textit{Aurora and Franklin Gazette}
(Philadelphia), July 7, 1826.
individuals often recorded specific foreign coins received, and listed their value in the understood monetary system. In 1798, Thomas Dilworth called bookkeeping “a Science which all Men ought to be acquainted with, but highly worth the Attention of every one concerned in Trade.” In the opening example of this chapter, Thomas Shields listed the different types of coinage that he received from Joseph Sturgis, stated their exchange rates, and defined their values in pounds, shillings, and pence—the common unit of account. He did all of this in an account book, or, more specifically, a daybook.

In general, through most of the region and period under consideration, the majority of consumers and merchants used an advanced version of single-entry bookkeeping—what economist Basil Yamey terms “incomplete double entry,” or what W.T. Baxter calls “a slipshod system of single entry” and “bookkeeping barter.” Large wholesalers and international merchants, on the other hand, used the more detailed, profit-driven, and famed double-entry method of bookkeeping. According to Patrick Kelly, single-entry bookkeepers kept two different types of account books. The first, a daybook (also called a waste book), tracked transactions as they occurred on a daily basis, with no regard to the corresponding consumer or merchant. A ledger, on the other hand, listed each transaction by individual, or account. Oftentimes, a

134 Thomas Dilworth, The Young Book-Keeper’s Assistant: Shewing Him in the Most Plain and Easy Manner, the Italian Way of Stating Debtor and Creditor (London: Richard and Henry Causton, 1798), ii.

bookkeeper used his or her daybook on a regular basis, only to transfer the transactions into the ledger on a semi-regular basis. Some bookkeepers only kept a ledger, entering daily transactions directly into their corresponding accounts, and eliminating the need for a daybook.

For most bookkeepers, entries followed a similar pattern. First, it was important to recognize who was paying whom, and the bookkeeper listed each individual as a debtor (Dr.) or a creditor (Cr.). When the bookkeeper paid with physical currencies, he or she designated the corresponding entry with “Dr.,” and “Cr.” when that person received money. For transactions that specifically included foreign coinage, entries generally followed the following format: name of individual, designation of debtor or creditor, “to” or “by” (whether Dr. or Cr., respectively), the amount and type of foreign coin, the exchange rate (sometimes preceded by an “@” sign), and the total worth in the common unit of value. [See Figures 1 and 8]. Thus, another entry in the daybook of Thomas Shields read, “Meredith & Clymer...Cr. By 170 Dollars worth of Spanish Silver @ 7/6 // 66.15.0.” This meant that the firm, Meredith & Clymer paid Shields 170 Spanish silver dollars, at the rate of seven shillings, six pence (7s.6d.), for a total of 66 pounds, 15 shillings (£66.15s.). The similarities in bookkeeping methods were not coincidental. Textbooks on the subject


137 Shields, 19.
recommended them, such as *The Young Book-Keeper’s Assistant* (1798) by Thomas Dilworth or Thomas Sarjeant’s *An Introduction to the Counting House* (1789).  

While not all consumers and merchants listed each foreign coin they received in the course of commerce, others went to great lengths to do so. For example, John Baker, a shoemaker and farmer from Dorchester, Massachusetts, made no mention of any foreign coin and listed all transactions in pounds, shillings, and pence—the common unit of account during his lifetime. Meanwhile, his son James Baker listed a great variety of foreign coinage circulating in the second half of the 18th century in the same town, as in “four Barrel of Apples [*sic*] at 4 Pistreens Pr Barrel” that he sold on December 27, 1765 for seven pounds, four pence (£7.4s.).  

In addition to those silver Spanish coins, Baker also mentioned gold Spanish pistoles and moidores; English half-, one-, and two-guinea coins; Portuguese Johanneses; silver Spanish dollars and fractional pieces; and English shillings and crowns. Baker discussed Spanish-American silver coinage in 136 different entries, more than any other type of foreign coin. In February of 1760, for example, Baker “Rec’d of Mrs. Hannah Rawson one Doler [*sic*]…for her sons shoes & potatoes.”  


\[140\] Ibid.
American currency was when Baker “Bought a Puppe Dog of Doctr. Hassel & Gave him one Quarter Doler for him” in October of 1773.¹⁴¹

Contrary to earlier research, individuals who identified the specific foreign coinage that they received generally did so regardless of the individual who paid him or her. Economist and historian Farley Grubb, for example, states that people “explicitly record[ed] different monies within the same transaction” only during “unregulated one-off transactions between strangers.”¹⁴² James Baker, however, seems to have had a familiarity with most of the customers with whom he performed business, including those he individually recorded coins in payment. Most of these individuals appeared throughout the account book many times before the entries that mentioned the foreign coinage. He had even given personal loans to some. Likewise, Joseph Sturgis did not appear as a stranger to Thomas Shields in the opening account. The former co-founded a business partnership, Shields & Sturgis, with Archibald Shields—a relative of the silversmith. Both the partnership and the individual appear throughout the daybook. Grubb is correct, however, when he states that “merchants’ account books, bank records, government account, and statements about economy-wide aggregates cannot be safely used to trace the medium of exchange in use because they may just reflect unit-of-account money.”¹⁴³ While individuals did sometimes make note of the specific coin they received, one should not assume that he or she did

¹⁴¹ Ibid.


¹⁴³ Ibid., 1341.
in every entry. Some foreign coinage appeared in cryptic forms, such as when James Baker “Rec’d an 18 Pound Piece” on November 4, 1762. More than likely, he had received a Portuguese Johannes coin (worth £18), as no other single coin converted to such a sum.

Even with arithmetic textbooks and the apparent need to know how to perform these operations, some individuals could not. They relied on and trusted others to keep their books for them. This occurred on both professional and community-based levels. Ebenezer Love of Portsmouth, New Hampshire, for example, advertised that he “takes Care of Tradesmens and others Books, Accompts, &c. or will wait on any Gentleman at their House at seasonable Hours on very reasonable Terms, and with the greatest Care, Secrecy, Fidelity and Dispatch.” [See Figure 15]. Similarly, historian Jerald E. Brown, in The Years of the Life of Samuel Lane, notes how Lane also kept the account books of others. However, he did not advertise these abilities like Love did. Lane, on the other hand, did this job “primarily for his neighbors, who knew of his abilities.” The proportion of those who maintained their own books compared to those who had others perform that task is unknown. Most individuals, however, likely did not incur the additional expense and kept their own accounts.

While bookkeepers listed foreign coinage in account books with some regularity, they rarely left evidence as to which method they took to perform the

144 Baker and Baker, Account Book.


146 Brown, 56.
conversion into the common unit of account. In other words, they didn’t show their math. Thomas Shields, for example, though a gifted silversmith and an intelligent person, was probably not a mathematical prodigy and could not mentally calculate the value of 18½ dollars and one French crown at 11 shillings and three pence each. He would have performed a written calculation to realize that they converted to 10 pounds, eight shillings, and one-and-a-half pence (£10.8s.1½d.). However, he did not include these calculations in his daybook, and thus left no indication as to the method that he used. Rather, he likely used a piece of scrap paper subsequently discarded. Finding and recognizing such equations are rare. One of the few recognized cases located to date came from a receipt dated October 21, 1800, when Hugh Mattison purchased a group of textiles from Alexander Adamson in New York City. At the bottom-left corner of the receipt, Adamson converted the sum from pounds, shillings, and pence to United States dollars; 57 pounds, 12 shillings, six pence (£57.12s.6d.) into 144 dollars and six cents ($144.06) [See Figure 16]. Adamson used one of the known rules to reduce coins: multiply the given amount by two-and-a-half. He reduced the initial sum and added the results together, so that 57, 57, 28.5, and 1.56 came to 144.06 (£57 + £57 + £28.5 + £1.56 = $144.06). This seemingly insignificant math problem represented a lifetime of learning crossed with an instance of practice, at a time when many forms of currency circulated in the United States. Even the individual who performed the calculation likely took the lifetime of learning and practice necessary to perform this conversion for granted.

Conclusion

Throughout the late 18th to mid-19th centuries, conversion of the array of foreign coinage that circulated in the Mid-Atlantic States and New England into a common unit of account proved absolutely essential for the efficiency of commercial transactions. Without such actions, the monetary values of the coinage in circulation would not have made any sense in relation to one another, leading to perpetual confusion in basic day-to-day business. In order to reconcile these differences, colonial Americans and citizens of the Early Republic began to learn such conversions at a relatively young age through the study of arithmetic textbooks and cyphering books. Oft-learned skills—the reduction of coinage, the Rule of Three, and the Rule of Practice—eased the impending confusion that existed in the physical supply of monetary circulation. Almanacs, ready reckoners, and other types of commercial instructors reinforced these skills and kept consumers and merchants up-to-date with vital information, most notably the ever-changing rates of exchange. Tangible commercial exchanges of foreign coinage appeared in the daybooks and ledgers of consumers and merchants throughout the region, and each made their way into a common unit of account. The skills required and the calculations made by ordinary people to exchange the array of coinage were essential to the functioning of the young economy, where individual consumers and merchants were participants in the globalizing world of trade even in the most ordinary daily transactions.

Figure 10  Rule to reduce French livres tournois into Spanish-American and United States dollars. Nicolas Pike, A New and Complete System of Arithmetic (1808), 98.

Figure 11  Example of reminder on how to convert dollars into pounds sterling, ca. 1803. McAllister Family, Daybook, The Joseph Downs Collection of Manuscripts and Printed Ephemera at the Winterthur Museum, Garden & Library, Collection 534.
CASE I.

When the price of 1 yd. ℛ, &c. is an even part of one shilling:—
Find the value of the given quantity at 1s. per yard, ℛ, &c. then
draw a line underneath, and divide it by that even part, and the
quotient will be the answer in shillings, which must always be
brought into pounds.

CASE II.

When the price is pence, and no even part of a shilling:—Find the
value of the given quantity at 1s. per yard; divide the pence
into aliquot parts, for divisors, and the sum of the quotients aris-
ing from them, will be the answer.

CASE VIII.

When there are pence in the price which are an even part of a shilling,
besides an even number of shillings under 20; First find the value of
the quantity at the shillings per yard, &c. according to Case 5th;
then suppose the quantity to stand at shillings per yard; divide
it by that even part, which the pence are of 1s. and this quotient
being added to the value before found, the sum will be the an-
swer.

Figure 12  Examples of "cases" to memorize for the proper usage of the Rule of
Figure 13  Method for computing the Rule of Practice. John Dean, *The Rule of Practice Methodized and Improved* (London: G. Keither, 1756), 244.
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Figure 14 Ready Reckoner page to multiply a number of items by nine cents. The Federal Ready Reckoner: Or, Trader's Valuable Guide, in Purchasing and Selling All Kinds of Articles, by Wholesale and Retail (Worcester, MA: Leonard Worcester, 1795), 30.

Figure 16   Receipt showing conversion from pounds and shillings to United States dollars. Alexander Adamson to Hugh Mattison, receipt dated October 21, 1800, “Bills,” Collection 145, Box 3, Textiles/Fabrics Folder #2, The Joseph Downs Collection of Manuscripts and Printed Ephemera at the Winterthur Museum, Garden & Library.
Chapter 3

“CLUNG TO THEIR WELL WORN SHILLINGS AND SIXPENCES”: HOW THE SPANISH DOLLAR INFLUENCED PRICING STRUCTURES IN THE UNITED STATES, CA. 1740–1880

‘How much did you say it was?’—three-and-sixpence?’ asked the lady.

‘Four-and-six-pence, if you please, ma’am,’ said the driver.

‘O, four-and-six-pence!’ And after a good deal of fumbling, and shaking of her pockets, she at last produced a half dollar, and a York shilling, and put them into the driver’s hand.

‘That is not enough, ma’am,’ said the driver; ‘I want nine-pence more.’

‘What!—ain’t we in York state?’ she asked, eagerly.

‘No, ma’am,’ replied the driver; ‘it is six shillings, York money.’

‘Well,’ said the lady, ‘I used to be quite good at reckoning, when I was to home, in the state of New-Hampshire; I’ve reckoned up many a fish v’yage; but since I have got so fur from home, I b’lieve I am beginning to lose my mental faculties.’

Anyone who read this fictional newspaper story in 1840 would have recognized the conundrum in which the New England lady found herself. Based on the debate between the lady and a coach driver, they would have known that the coach was likely on its way to New York, but was still in either Massachusetts or Connecticut. While

148 “From the Knickerbocker.—Continued from No. 3,” The Polynesian (Honolulu, HI), July 4, 1840, 1. Although published in Honolulu, James Jackson Jarves of Boston, MA published The Polynesian. The Knickerbocker, or the New-York Monthly Magazine was published in New York City from 1833 to October 1865.
the nuances between the state shillings took a century to develop, they traversed the different sectors of American society. Disputes like these might have begun in urban environments, where the habit of pricing goods and services in shillings and pence before converting the sum of a bill into dollars and cents began, but would have lasted the longest in rural regions. By the time the above story reached publication, readers in both settings would have known the difference between a York shilling and a New England Shilling, as well as the shillings and pence of at least some other states. They could quickly recognize that the woman gave the driver 62½ cents, when the fare was 75 cents, even though the passage did not use the word cent at all, and they could sympathize with the woman as she fumbled for another 12½ cents to give the driver, a victim of different monetary customs from one region to the next within the United States.

Satire on this method of “reckoning” cash payments reflected the prevalence of its use. Not only did such stories tell of conundrums that Americans got themselves into when they travelled from one region to another, but also when foreigners came to the nation. A tale from The Moral Instructor, for example, involved a young Frenchman and a visit to New York in the early 1850s. When asked to pay for a meal, he handed the waiter a half dollar, thinking it equaled three shillings. When the waiter handed him his change, the Frenchman proclaimed, “Diable! Change! I tought you say tree shilling.” After explained to that his half dollar was worth four shillings in New York, the Frenchman grumbled:

\[\text{[149] Thomas H. Palmer, The Moral Instructor; or Culture of the Heart, Affections, and Intellect, while Learning to Read, Part IV (Boston: Ticknor, Reed, and Fields, 1851), 148.}\]
York shilling! What sort of shilling is dat? Begar, dis is one strange country! Every place I go, new kind of money. In Canada, tree shilling is sixty cent. In Vermont, tree shilling is fifty cent. Here, tree shilling is thirty-seven cent. By-m by, tree shilling vill be one cent, I tink.\textsuperscript{150}

Readers would have recognized that the coin that the Frenchman received as change was not a coin struck in the United States, nor was it an English shilling. Rather, it was a Spanish-American one-real piece—a coin that dominated the circulation of small change throughout most of the United States as late as the 1850s.

The circulation of Spanish-American coins through the colonial period and well into the 19\textsuperscript{th} century meant that terms such as \textit{shilling} and \textit{pence} survived in the vernacular of English-speaking Americans. While the meaning of these terms varied from place to place and often caused confusion for those who travelled into another region, pricing structures in the different regions also reflected those variances. The continuation of such terms also reflected the early factions that contended over federal and state power. Like the urban businessmen and merchants that made up the Federalist Party, federal currency circulated in cities in greater numbers. Where antifederalists were abound—largely consisting of rural farmers who resisted a national government—it took much longer for federal currency and nomenclature to take effect.

The physical condition of the coinage in use declined as it wore down beyond recognition. By the 1840s and 1850s, some coins weighed 25\% less than they should have. American merchants began to respond with a pricing structure that paralleled the domestic decimal coinage—five and 10 cents, instead of 6¼ and 12½ cents. As the

\textsuperscript{150} Ibid., 149.
coins that once enabled the use of shilling-pence system by Americans wore thinner and thinner, their dilapidated state began to push the monetary system closer to full decimalization; one based on dimes and cents. Through the Coinage Act of 1857, Congress declared that the United States no longer required Spanish-American silver, and consumers and merchants quickly removed the coins from circulation. Most Americans defined the United States monetary system in decimalized terms by the 1870s, though reports that rural individuals in the inland areas of the Mid-Atlantic and New England continued to reckon prices for items in this shillings-pence system circulated up through the early 20th century.

**From English Shillings to Colonial Shillings: Depreciation of the Dollar, 17th and 18th Centuries**

Beginning in the 17th century, the British-American colonies based their monetary systems on the Spanish-American dollar. Prior to this, as colonists emigrated from Britain, English shillings and sixpence were among the most familiar coins in circulation throughout the region. Naturally, colonial consumers and merchants continued to use the pound-shilling-pence structure as a unit of account. However, since the Royal Mint in London never received orders from officials to fulfil the currency needs of the American colonists, there was little choice other than to amend pricing structures to accommodate the coin actually in circulation: the Spanish-American dollar. For example, in 1675 the governor of New York proclaimed that pieces of eight would “bear 6s.6d.”, despite their value of four shilling, six pence

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(4s.6d.) in Great Britain.\textsuperscript{152} In the early 18\textsuperscript{th} century, Queen Anne issued a proclamation that forbade the Spanish dollar to pass for more than six shillings (6s.) in any of the colonies—a depreciation of no more than 25 percent. As colonists became familiar with the Spanish-American coins, they also became more adept in thinking in terms of dollars, shillings, and pence. During this early period the American colonists ceased using sterling coinage and developed colonial shillings into distinct monetary systems. The York shilling and the New England shilling began to represent two different sums. These regions did not begin to think in relative values again for another 200 years.

Still, there were never enough Spanish-American coins to meet the economic needs of the colonies.\textsuperscript{153} The colonists themselves began to issue small quantities of coinage and large amounts of paper money to meet this need, which led to further depreciation. From 1652 to 1682, for example, John Hull and Robert Saunderson struck twopence, threepence, sixpence, and one-shilling coins for the General Court of Massachusetts. In 1659, the second Lord Baltimore, Cecil Calvert, requested that the British Royal Mint strike fourpence, sixpence, and shillings for his colony. In 1737, Samuel Higley, doctor and local copper-mine owner in Granby, Connecticut, mined his own metal, engraved the dies for, and struck his own copper threepence. [See Figure 17]. These coins, while numismatically significant, had relatively low mintage

\textsuperscript{152} Ibid., 142.

\textsuperscript{153} Seavoy, 64.
figures and provided only minor monetary stimuli in each of those economies. In 1690, the Massachusetts Bay Colony issued the first paper currency in the Americas. Other colonies followed suit to varying degrees. Those issuing large amounts of paper currency caused the shilling-to-dollar ratio to depreciate to greater extremes than those who issued bills in more moderate numbers. According to one 18th-century statistician, the ratio between shillings and dollars was seldom “the same in two different Provinces at a time, and often changing values in the same place.” Before 1725, in New Jersey, Maryland, and Delaware, the Spanish dollar equaled five shillings (5s.), when an over-issue of paper currency depreciated the dollar to seven shillings, six pence (7s.6d.) each. Pennsylvania followed suit in 1742. In New York after 1665, the English set the value of the Spanish dollar at eight shillings (8s.), which maintained stability up to the American Revolution.

Colonies throughout New England released the largest issues of paper money, which caused the most inflation in British America. Repeated emissions to pay for military expeditions to New France after 1712 led the shilling to fall beyond normal rates: estimated in 1716 at 9¼ shillings to the Spanish-American dollar; in 1717, 12; in 1722, 14; in 1728, 18; in 1730, 20; in 1737, 26; in 1739, 27; in 1741, 28, and finally to 45 shillings-per-dollar by 1749. The Act of February 9, 1736/37, allowed for a new

154 The Massachusetts “tree shillings” are an exception to this. They had the largest mintage figures of these three types of coins. Surviving examples of each type, however, are generally worn down due to extensive circulation.


156 Ibid., 17.
currency to replace the old—“Lawful Money” (more often spelled “Lawfull Money,” or abbreviated “L.M.” in account books) substituted the “Old Tenor” currency (abbreviated “O.T.”)—at the rate of three-to-one. This split the New England shilling into two different monetary systems, and consumers and merchants kept either the inflated rate of the Old Tenor, or the reduced sum of Lawful Money as a unit of account. Continued inflation and the Act of January 15, 1741/42 raised the rate to four Old Tenor shillings for one shilling in Lawful Money. Finally, in the Act of January 26, 1749/50, the Massachusetts General Court secured a large quantity of sterling coinage from England to use in redemption of the inflated paper currency, at the set rate of 7½ Old Tenor shillings to one shilling in Lawful Money. However, inflation had already grown to this rate in the course of commerce as early as 1743. On September 3rd, for example, Joseph J. Lindsey of Marblehead, Massachusetts gave 100 Old Tenor shillings (100s.) in “Cash Lent to Lew” at the Lawful Money rate of 13 shillings and four pence (13s.4d.), or seven-and-a-half to one. A 1750-dated Boston exchange chart “to bring Old Tenor into Lawful Money” corroborated this rate.

Despite these legal measures, consumers and merchants who used account books continued to use Old Tenor as a pricing measure, and Lawful Money as a newly adopted unit of account, or vice versa, or both. Account books show that even small business owners and craftspeople used both systems. On September 25, 1756, for


159 United States Department of Labor, 17.
example, shoemaker James Baker of Dorchester, Massachusetts paid a bill to Thomas Trott for two dollars, but recorded the sum in his account book as four pounds and 10 shillings, Old Tenor (£4.10s. O.T.)—the inflated rate of 45 shillings per dollar.\textsuperscript{160}

From the 1740s to the 1770s, joiner Joseph J. Lindsey of Marblehead, Massachusetts alternated between Old Tenor and Lawful Money, presumably based on the method in which his customers kept their accounts.\textsuperscript{161} Some individuals such as Abiel Abbott, a cooper from Andover, Massachusetts, reckoned prices in Old Tenor as late as the 1790s.\textsuperscript{162} The Lawful Money, however, stopped the depreciation of shillings per Spanish-American dollar, and remained at a stable six-to-one ratio in New England until the Revolution.\textsuperscript{163}

\textbf{From Colonial Shillings to State Shillings}

While the ratios between the various colonial shillings and the Spanish-American dollar remained fairly stable through the middle half of the 18\textsuperscript{th} century, the American Revolution disrupted this. Beginning in May 1775, the Continental Congress issued Continental Currency to help fund the Revolution and pegged this new currency directly to Spanish-American dollars. Notes ranged from one-sixth-of-a-dollar (or one New England shilling) to 80 dollars. [See Figure 18]. Congress was forced to print subsequent issues at exorbitant levels, which led to further depreciation

\textsuperscript{160} Baker and Baker, \textit{Account Book}.

\textsuperscript{161} Lindsey, 1.


\textsuperscript{163} United States Department of Labor, 16–17.
in the ratio of shillings-per-dollar. The Day Book of Philadelphia silversmith Thomas Shields demonstrates the effects of this rate of depreciation on everyday life. For example, until April of 1776, he accepted Spanish silver dollars “@ 7/6,” or seven shillings and six pence (7s.6d.)—the Mid-Atlantic rate. On June 3, however, he accepted “11 Spanish Mill’d Dollars” from Leadlie Y. Nelson for four pounds and eight shillings (£4.8s.), or at the rate of eight shillings per dollar (8s.). On August 13, he accepted “8 Silver Dollars @ 8/6,” or eight shillings and six pence each (8s.6d.), and by December of 1776, this grew to 11 shilling, threepence per coin (11s.3d.). By mid-1777, the ratio stabilized back to normal, and even the “128 Cont. Dollars” that Shields received from his sister-in-law on September 5th traded at the rate of 7s.6d. each. Further depreciation occurred in the 1780s, when Shields received “15 dollars in State money at 3¼ for one, say is worth £1.12s.2d.” when it should have equaled five pounds, 12 shilling, sixpence (£5.12s.6d.). The Pennsylvania Hospital faced the same levels of inflation in the number of shillings that equaled a Continental dollar. In 1780, the hospital paid 18 dollars for a peck of potatoes, 12 dollars for a pound of coffee, eight dollars for a pound of butter, and four dollars for a loaf of bread. Throughout the period people quipped that low-valued objects were “not worth a Continental.”

164 Shields, 53.
165 Ibid., 62, 69.
166 Ibid., 84.
167 Ibid., 98.
168 United States Department of Labor, 17.
When Congress adopted its own monetary system based on United States dollars and cents in the 1780s, the record-keeping techniques of American consumers and merchants did not automatically change. Much like the alternate usage of Old Tenor and Lawful Money throughout New England, it took another 60 to 80 years for the new method to supplant old methods completely in the United States. The primary difference was that consumers and merchants could then define shillings in the decimalized United States dollar, instead of the Spanish-American coins, which were divisible by fractions down to 1/16th of a dollar. By this time, the depreciation of the respective state shillings had settled, and the colonial rates simply carried over into the national monetary system. Consumers and merchants accepted a variety of foreign or domestic coinage in trade and calculated the sum into the shillings of his or her respective state. Then, between 1795 and 1805, most began to convert the shillings into a dollar amount.\(^{169}\) The United States dollar equated to eight shillings in New York and North Carolina, or 12½ cents each (1s. = 12.5¢); seven shillings, six pence in the Mid-Atlantic States, or 13.3 cents each (1s. = 13.3¢); six shillings in New England and Virginia, or 16.7 cents each (1s. = 16.7¢); five shillings in Georgia, or 20 cents each (1s. = 20¢); and as low as four shillings, eight pence in South Carolina, or 21.4 cents each (1s. = 21.4¢).\(^{170}\)

While most consumers and merchants talked about “York shillings” and “New England shillings” during this period, and each understood the value of them, physical coins with those names did not exist—now known as a *ghost currency*. The United


States Mint never struck a coin called a “York shilling,” nor did it issue a coin worth 12½ cents. The terms were merely a unit of pricing used by consumers and merchants in their respective regions throughout the country, and each were distinct from the other, from the British pound sterling, and from any other monetary system that used similar terminology. In the 1840s, British traveler William Brown expressed surprise when he learned that American workers did not earn as much as he initially realized, because “the ten shillings which he gets per day is not ten shillings sterling; a New York shilling is only of the value of an English sixpence.”\(^\text{171}\) Israel Ward Andrews notes that “Nowhere in the United States did the term ‘pound,’ used by itself, mean the English pound. It always meant the pound of the state where the transaction took place.”\(^\text{172}\) Each state shilling maintained a specific and invariable relationship to the United States dollar while they varied with each other. The dollar in New England contained six shillings—no more, no less. In New York, eight shillings—no more, no less. However, in New England, one shilling represented about 69.3 grains of silver and a pound (20 shillings) equaled $3.33, whereas a New York shilling represented only 52 grains of silver and a pound (20 shillings) equaled $2.50.

Due to the inefficiencies of the early United States Mint, it proved difficult to physically produce enough domestic coinage to completely replace that which circulated in the colonial era. Although the Mint did emit domestic coin, and many

\(^{171}\) William Brown, America: A Four Years’ Residence in the United States and Canada; Giving a Full and Fair Description of the Country, As It Really Is, With the Manners, Customs, & Character of the Inhabitants, Anecdotes of Persons and Institutions, Prices of Land and Produce, State of Agriculture and Manufactures (Leeds: Kemplay and Bolland, 1849), 66–67.

\(^{172}\) Andrews, 143–144.
lawmakers did push for a decimalized system, neither of these influenced significantly the methods that consumers and merchants used to price their goods and services. The distribution ultimately reflected early contentions over federal and state power. While the urban businessmen and merchants who made up the Federalist Party adopted federal currency relatively quickly, rural farmers who identified as antifederalist resisted a national government and it took much longer for federal currency and nomenclature to take effect. Although it took the Mint until the 1840s to have the resources and machinery to produce enough coins, it took even longer for American society to fully implement their circulation. In June 1858, for example, leading economist Henry C. Carey blamed the federal government for its inability to inject federal coin into all parts of the nation and for “leaving the local authorities to continue in the exercise of all the powers not expressly parted with.”

Until then, the silver and gold coinage of the British, French, Portuguese, and—most notably—Spanish-American empires that circulated in the United States influenced pricing and monetary customs far more than domestic coinage could. The Spanish-American dollar and its parts (i.e. half, fourth, eighth, and sixteenth) dominated in influence.

The physical coins that represented the various shillings and half shillings had different names in each region. One coin could have as many as four different regional names. It could be worth one number of shillings in one state and another amount elsewhere, yet have one set value in national terms: “The fourpence, the ninepence, the picayune, the shilling, the sixpence, the fip, and the levy. These the reader would naturally understand to be seven different coins, whereas the seven were in fact only

173 Henry C. Carey, “Mr. Carey’s Letters to the President,” *The American Merchant* 1, 2 (June 1858): 88–89.
two, with various names.” The one real and medio-real coins, or one-eighth and one-sixteenth of a Spanish-American dollar, respectively, were two coins that dominated monetary circulation from the late-18th through late 19th century. [See Figure 19]. Instead of calling them by their proper denominations, American consumers and merchants changed the names of the coins in order to conform to their regional systems of shillings-and-pence. In 1907, Charles A. White noted, “It is a curious fact that, although the Spanish supply then constituted the principal part of our current coins, Spanish names for those coins were practically discarded by the people of the United States.”

In 1856, the Washington newspaper *Evening Star*, discussing the one-real coin, noted that, “in fact, every locality has a separate epithet for the smooth-faced ‘little joker.’”

Furthermore, it was not uncommon for an individual to physically cut a coin to provide for small change. [See Figure 20]. A cut coin began its life as a full, round Spanish-American coin, but, in the course of daily commerce, a buyer or seller literally cut the coin to give the correct payment or supply change during a monetary transaction. This was perfectly acceptable. Round dollar coins were generally cut into equal parts of halves, quarters, eighths, and sixteenths. Cut half-dollars equaled four reales; cut quarters, two reales; and so on. One, two, and four-reales coinage also

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174 Andrews, 146.


often suffered this fate. Someone could have cut a two-real coin, for example, into quarters to make $6\frac{1}{4}$ cents.

For most regions, the colloquial name of the coin reflected its value. For example, since the one-real coin equaled one-eighth of a dollar, and the dollar represented eight shillings in New York, people in that region called the one-real coin a *shilling*. Likewise, they called the Spanish-American medio-real coin a *half-shilling*, or a *sixpence*—the fractions of the Spanish dollar fit nicely into the shilling-pence system.\(^{177}\) Due to the similarities between $12\frac{1}{2}$ cents to a York shilling, and 12 pence to a sterling shilling, the United States copper one-cent piece earned the nickname *penny*, which Americans still use.\(^{178}\) In the Mid-Atlantic States, however, differences in values did not make this relationship so simple. A shilling equaled 13.3 cents, but a one-real coin still amounted to 12.5 cents. With 12 pence to the shilling, a one-real coin (12½ cents) equaled 11.3 pence. Consumers and merchants, therefore, called the one-real coin an *eleven-penny bit*, and abbreviated to a *levy*.\(^{179}\) The medio-real coin, valued at just over five pence, earned the name a *five-penny bit*, a *fipny bit*, or simply a *fip*—but it was still valued at $6\frac{1}{4}$ cents.\(^{180}\) In the Southern States and along the Mississippi River, the one-real coin became a *bit*, while they knew the medio-real

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\(^{177}\) Andrews, 147. White, 100.

\(^{178}\) White, 100.

\(^{179}\) Andrews, 147.

\(^{180}\) White, 100–101.
piece as a *picayune*, an anglicized Créole term meaning ‘small coin’.\(^{181}\) Neither *fip* nor *levy* existed in the plural form, as with the terms *shilling* and *bit*.\(^{182}\) According to New England native Charles A. White, consumers and merchants called the 12½-cent one-real coin a *ninep'ns*, due to its relative value of nine local pence. The medio-real coin was worth four-and-a-half pence, or *fo-pns hăpny*. A quarter-dollar piece—worth one shilling and sixpence—received the name *One'n'six*. White felt that “these terms and their pronunciation pertained to the prevalent serious speech of the people and were in no way exceptional or frivolous.”\(^{183}\) While this may appear absurd to present-day readers, Andrews noted that, “As to the purchaser being compelled to translate back into cents the expression one and six before he could pay his money, it is enough to say that precisely such transaction had been of everyday occurrence in New England for more than a hundred years before our money term cent was ever heard of.”\(^{184}\)

From this history of simultaneously using Spanish-American coin and English vernacular, American consumers and merchants conducted business with two different units of value—the federal dollar and the various state shillings. Speaking on this situation, Thomas Jefferson noted:


\(^{182}\) White, 100.

\(^{183}\) Ibid., 100.

\(^{184}\) Andrews, 148.
They—the people of the United States—have now two units, which they use with equal facility, viz.: the pound of their respective state and the dollar. The first of these is peculiar to each state; the second, happily, common to all. In each state the people have an easy rule of converting the pound of their state into dollars or dollars into pounds.  

The development of this multilayered monetary system must have come as a surprise to Jefferson. While he designed the decimalized dollar as the monetary system for the United States in 1785, the old system took generations to fully disappear. In 1847, one observer lamented about how this situation “arose the different currencies in the several colonies, and which remain to the present day; and with which many of the people are now more familiar than with any other currency.”

“*Instruments of Retail Reckoning*: 19th Century Usage of State Shillings

Throughout the 1850s, the Decimal Coinage Commissioners of Great Britain weighed the advantages and disadvantages of that country converting to a decimal monetary system. Although this did not come to fruition in Great Britain until 1971, the Commission left a trove of mid-19th century evidence as to the state of global decimalization, including that of the United States. The Commissioners found that “the old shillings and sixpences of the provincial currencies are still retained concurrently with the legal coinage as instruments of retail reckoning” by American consumers and merchants and that “an American shopkeeper will more readily say

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185 Ibid., 144.
two shillings and threepence than 37½ cents.” One individual testified that omnibus conductors and shopkeepers in the United States kept this method in place by still “fixing their prices in shillings and sixpences.” After his travels in the United States, Reverend Professor Philip Kelland was astounded at “the remarkable fact that the word shilling meets your ears at every turn in many parts of the States.”

In bills, receipts, and account book entries, most Americans wrote in a similar manner to the way that they recorded foreign coinage, by recording the number and name of product, number of shillings per unit, and then the total amount due in dollars and cents. For example, on January 3, 1803, cabinetmaker John Doggett of Roxbury, Massachusetts sold Nathan Lazell of Bridgewater three medium-sized picture frames for a total of six dollars. His daybook, however, reveals that Doggett priced the frames in New England shillings before he converted them into United States dollars. [See Figure 21]. He wrote, “3 picture frames 21 by 20 at 12/ … 6.00,” meaning three picture frames, 21 inches by 20 inches, at 12 shillings each, for a total of six dollars. In the same transaction, Doggett sold Lazell “2 do. 7 by 9 at 3/ … 1.,” or two more picture frames, seven inches by 9 inches, at 3 shillings each, for a total of one dollar. This single listing exposes the use of New England shillings quite plainly, as

187 “United States,” 11–12.

188 “United States,” 11.


191 Ibid., 1.
two frames, three shillings each, equaled one dollar—six shillings equaled one dollar (6s. = $1). In New York, these same frames would have cost eight shillings, but still one dollar since eight York shillings equaled one dollar (8s. = $1). In Philadelphia, a consumer could have expected to pay seven shilling, six pence (7s.6d. = $1).

To most American consumers and merchants, this system of using Spanish-American coins involved a site-specific adaptation of the British pound-shilling-pence method before converting the sum into United States dollars and cents. As complicated as this may seem, it proved the most convenient and familiar method to Americans. In the early 1850s, for example, a newspaper reporter acknowledged, “It is said that our coinage of five and ten cent pieces, does not adapt itself to prices, the small Spanish coins being found in retail transactions more convenient.”

Reverend, editor, and abolitionist Joshua Leavitt of New York asserted “that for small circulation and payments in marketing, huckstering, and the like, a duodecimal coinage is also wanted, and preferable to the other” and as a result, “the American people during sixty years have clung to their well-worn shillings and sixpences, perceiving them to be a great public convenience.” Leavitt even believed that their extensive use in society would ultimately force Congress to reject the decimal system altogether:

For myself, I have no idea that we shall ever abandon the shilling currency; the lapse of generations has only fixed it more firmly upon us, and I fully believe that in a few years we shall have a Congress so governed by common sense, and so alive to the convenience and welfare of the people, that they will legalise the York shilling and

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sixpence, as the eighth and sixteenth of a dollar, and will give us from our own Mint a corresponding coinage. 194

After his travels in the United States, Professor Kelland, Dean of the University of Edinburgh, expressed shock and wonder in his recognition that “the decimal system has been the legal system in America for 60 years, and dozens have not yielded a hair’s breadth as yet.” 195 Despite the complications associated with the names of particular coins, many people preferred the familiar duodecimal system (12-base) over the decimal dollar (10-base).

Duodecimal calculation for commercial use often found preference as a result of a mathematical phenomenon. A decimal system worked easily for adding and subtracting, and even the multiplication of whole numbers, but division functioned best under a fraction-based duodecimal system. The mental ease in dividing a dollar into eighths, and further into sixths, quarters, thirds, and halves led economist Henry Dunning Macleod to the notion that “commercial instinct…utterly condemns decimal subdivision.” 196 While humans have devised many mathematical instruments, including numerals, as decimal systems for anthropomorphic reasons (i.e. because humans have 10 fingers), they do not necessarily accommodate the simplest functions of division. Halves, quarters, and eighths are easier to recognize than decimals and known by most early numerate cultures. Multiplying by 10s from one and dividing by


195 Ibid., 513.

196 Ibid., 513.
eighths or sixteenths into one sustained the mathematical theories of many civilizations for millennia. This also carried over into monetary systems. When the United States government adopted decimalization to divide the dollar, the old system, so engrained in the workings of commerce, required several generations to make a full transition to the new method of reckoning money.

Furthermore, the use of state shillings sometimes allowed for an easier method of multiplication than the decimal system. For example, in the 1850s, consumers and merchants still used state shillings even when a product listed a price in dollars and cents. Agricultural produce offered one example. When consumers and merchants dealt with multiples of like products, such as “9 bushels at 75c.” per item, many individuals did not simply multiply the two, as most people would today. In New England, consumers and merchants knew that 75 cents equaled four shillings and six pence (4s.6d.). Multiplying four-and-a-half by nine was much simpler than multiplying 75 by nine. After he or she calculated four-and-a-half by nine to 40½ shillings (40s.6d.), the consumer or merchant could then convert this back into dollars and cents: 40½ shillings divided by six shillings-per-dollar equaled $6.75. With enough practice, a consumer or merchant comfortable in commercial dealings could have easily calculated the sum by converting the dollars and cents into the shilling-pence system in his or her head.

Not all consumers and merchants favored this system. By the 1850s, for example, mathematician Dana P. Colburn felt that “these terms thus used, are very inconvenient; and will, it is hoped, soon be entirely superseded by the decimal

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197 “United States,” 11.
currency of the United States.” As late as 1869, editors of the Delaware Tribune wrangled with “the desirability of having prices in shillings. If New York is the National Metropolis,” they groused, “it is her business to get rid of her provincial habits. The word ‘shilling’ is meaningless to our people and the currency of this nation is dollars and cents.” Economist Hugh Rockoff praises the decimal system for the simple fact that “it is also highly satisfactory to the public since having one unit of account and one medium of exchange denominated in that unit of account is highly convenient.” Many consumers and merchants saw the benefits associated with accounting, commerce, and the decimal dollar. They felt that the old system was inconvenient, meaningless, and, one might argue, far too British.

Still, schoolchildren throughout the country learned this method of reckoning in schools and through textbooks. In 1850, Roswell C. Smith, in the textbook The Little Federal Calculator, asked, “When a boy from New England goes to New York, what will his ninepences and fourpences be called there? If he should go to Philadelphia, what would they be called there? If he should bring away with him levies, New York shillings, and fips, what would they pass for in his own town?” [See Figure 22]. Roswell asked this not to confuse his readers, but because it was

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199 Delaware Tribune (Wilmington, DE), June 24, 1869, 1.


201 Roswell C. Smith, The Little Federal Calculator: Consisting of Questions and Tables to Employ the Mind and Fingers Only; Designed Particularly to go before the Slate and to Prepare for It (New York: Cady & Burgess, 1850), 35.
practical knowledge. This and many other textbooks contained sections with titles similar to “Rules for Reducing the Currencies of the Different States,” such as a rule “to reduce New-England, &c. to New-York and North-Carolina currency, to any given sum add its third part; and, vice versa, subtract a fourth part.” Cecil B. Read notes that “One might, of course, expect that problems of this nature would be of importance before the forming of the nation, but it is surprising to note how long such problems remained in arithmetic textbooks after the federal government was formed.”
Authors listed rules for state currencies in sections adjacent to, or sometimes in the same section as rules and methods for converting foreign coinage. Some ready reckoners listed prices of 12½, 18¾, and 37½ to correspond with the York shilling well into the 1850s.

This immaterial pricing structure reflected the physical coinage in circulation, with adverse effects on the decimal system. Odd prices in decimal form resulted from the non-decimal coinage that passed from hand to hand. The report of the Decimal Coinage Commission noted that, in Britain, prices reflected the coins in circulation—threepence, sixpence, a shilling, etc.—but not in such odd prices as one shilling, seven pence (1s.7d.) or two shilling, eleven pence (2s.11d.). In the States, however, the Commission found such oddities, the greater regularity in prices marked 31¼ cents as

202 New And Complete Tables of the Net Duties Payable, and Drawbacks Allowed (London: D. Steel, 1796), 85.
opposed to 30 cents; or 37½ cents to 40 cents. Thirty-one-and-a-quarter cents, for example, equaled two shilling, six pence (31½¢ = 2s.6d.). As long as non-decimal coinage transpired in the monetary system of the United States, the decimal system would never flourish to its full potential. The Commission concluded that the shilling-pence system continued into the 19th century due both to “persistency of ancient habits” and “the superior convenience of the old system, at least for the purposes of retail trade.”

The inconvenience experienced by consumers and merchants through the simultaneous use of two systems, however, would not have occurred if sufficient decimal coinage circulated in the United States. The proliferation of odd prices resulted from the lengthy transitional period when merchants based individual pricing structures on non-decimal fractions, but calculated the totals in a decimal unit of account.

The regional characteristics of the shilling-pence systems were too limiting for some companies, and led them to support the decimal dollar. Industries such as publishing, which hoped to have a national audience, did not utilize the regionalized modes of reckoning. Many literary publishers made the conscious effort to adopt the decimal system by the 1830s. For example, Woodworth’s Youth Cabinet, published in New York from 1837 to 1857, sold single copies of their magazine for “12½ cents,” whereas most objects consumed in New York generally sold for the equivalent “one shilling” (1s. York = 12½ cents). If the publisher priced the magazine at one shilling, individuals in New England or the Philadelphia region paid a different


206 Frances C. Woodworth, editor, Woodworth’s Youth Cabinet 6, 11 (New York: D.A. Woodworth, November 1851), cover.
amount. In his report on decimal currency, Kelland disclosed that the Harper & Bros. publishers in New York City were “driven to the decimal system” because they were “obliged…to make their prices intelligible to strangers, whilst the dealers in broadcloths and muslins, in tea and tobacco, are under no such compulsion.”

Similarly, throughout the 1850s, the textbook Farrar’s Cambridge Mathematics sold for the odd price of $4.67—the equivalent of 28 New England shillings. Had G. Hilliard and Co., of Boston, not desired a national audience, they would have sold the textbook for the latter sum. Kelland felt certain that “a purchaser going into the shop of Mr. Hilliard, and demanding the price, would be replied to in shillings rather than in dollars.”

Not all companies decimalized, however, and actually embraced the various names. Before 1845, the steamboat Joe Johnson, for instance, made the seven-mile ride from Washington D.C. to Alexandria “at a Virginia ninepence, a Maryland levy, or a York shilling per passenger.” [See Figure 23]. In that year, however, the owners replaced it with a “finer boat” that made the trip “at a fip instead of a levy.” Travelling only between Washington and Alexandria, the Joe Johnson did not expect to reach a truly national audience. Situated between or near a few of the state shilling-pence systems—Virginia, Maryland (or Pennsylvania), and New York—the individual who wrote about the Joe Johnson knew that travelers from any of these regions could potentially ride the boat and decided to list the various forms of payment.


208 Ibid., 13.

Spanish-American silver coins were not the only coinage in circulation, however, which led to further complications. When individuals paid for goods with fractional prices with a decimal dollar, either the consumer or the merchant lost fractions of a cent with each transaction. In 1852, *Arthur’s Home Gazette* published an article that outlined two such instances when the available coins left one party shortchanged. The first dealt with an “old lady, plainly dressed,” who tried to pay for (what she thought was) a three-cent (3¢) omnibus ride with a levy (12½¢), but received only a fip (6¼¢) as change. Expecting her change to be nine-and-a-half cents (9½¢)—a difficult sum to physically make change for with the average money supply of most locations—the woman indicated that she would like to “get the half cent.” In the end, however, the omnibus driver only gave her a fip (6¼¢).210 The second example involved a woman who tried to pay for a piece of one-cent candy with a quarter dollar, only to receive a levy, a dime, and a cent (23½¢) in change, and complained that another cent was due to her. The confectioner, however, “considered an eleven-penny bit and eleven cents the best change that could be made.” The woman, agitated, gave back the candy, took her quarter, and departed. “It isn’t the first time she’s done that,” remarked the confectioner, “It was only a trick to get the candy for nothing. I’ve humored her several times, but I’m not going to do it any longer.”211 The article mentioned that certain consumers and merchants exhibited “much adroitness” in retaining the fractional parts of a cent. Some individuals provoked “frequent instances where a dime and two cents were refused for an article, the price


211 Ibid.
of which was twelve-and-a-half cents, or a New York shilling; and yet the same
persons, if called on to give change for a quarter-of-a-dollar, would most likely tender
two dimes and four cents, and refuse to give anything more.”212 People were
untroubled when they benefited from the system, but unnerved when left victim. A
writer from the Daily Evening Star called this swindle a “shaving operation” that left
consumers “almost inevitably cheated out of the half cent in making small purchases,
unless we happen to have the exact change.”213 A few months later, the same
newspaper called Spanish silver and the shilling-pence system “a pestilent currency
which finds favor with none but sharpers and dishonest dealers.”214

Other American tricksters used this skill specifically against unsuspecting
British visitors, taking advantage of the similarity in name and relative likeness in
value of the different types of shillings. In the 1830s, William O’Bryan visited the
United States and complained that “some Americans accommodate themselves to the
Englishman’s ignorance,” when they called a one-real coin a “New York shilling” and
a medio-real coin a “sixpence.” O’Bryan claimed that, “knowing the Englishman
counts twelve pence to complete a shilling,” American consumers and merchants had
“discovered a source of fraudulent gain.”215 By calling a United States one-cent coin a
“penny,” and the one-real coin a “shilling,” they accepted the twelve-and-a-half-cent

212 Ibid.


215 William O’Bryan, A Narrative of Travels in the United States of America, with
Some Account of American Manners and Polity, and Advice to Emigrants and
Travellers Going to that Interesting Country (London: Gilbert & Co., 1836), 405.
piece for only twelve cents, and the British visitor lost four cents on every dollar, as they counted eight of those shillings to a dollar.\footnote{White, 100.} Indeed, on August 28, 1795, Nathan Trotter bought 12-pound bags of sugar from George Wilson, who priced them “@ 1/8 dollar” as well as “@12½d.” (note: 
\textit{pence}, not \textit{cents}).\footnote{Nathan Trotter, \textit{Papers}. The Joseph Downs Collection of Manuscripts and Printed Ephemera at the Winterthur Museum, Garden \& Library, Collection 325.} O’Bryan commented that “the Americans are sharp witted traders, especially the Yankees (or New England men) and have no objections, to adopt the name of a shilling, instead of saying twelve and half cents, to please the Englishman, and gain half cent by it too.”\footnote{O’Bryan, 405.}

\textbf{“Smooth Fips and Levies,” Gresham’s Law, and the Coinage Act of 1857}

As individuals grew skillful at extracting half cents from unassuming consumers or merchants, the coins themselves began to lose value at an even higher rate. After years of use, the Spanish-American coins in circulation wore down lighter and lighter, losing more and more value. [See Figure 19]. Through a process known as Gresham’s Law—named after English financier, Thomas Gresham (1519–1579)—the lighter coins (as opposed to heavier foreign or newly struck United States coinage) remained in circulation. Known since ancient times, Gresham’s Law essentially states that “bad money drives out good.”\footnote{Redish, 30.} Suppose that two different types of money co-circulate a particular region for the same amount of purchasing value. If one of those currencies becomes overvalued, the other will be undervalued and will then disappear

\footnote{White, 100.}

\footnote{Nathan Trotter, \textit{Papers}. The Joseph Downs Collection of Manuscripts and Printed Ephemera at the Winterthur Museum, Garden \& Library, Collection 325.}

\footnote{O’Bryan, 405.}

\footnote{Redish, 30.}
from circulation. A variety of occasions provoked Gresham’s Law in the past: changes in the law, compositional variations, discoveries of large deposits of raw metals, and so on. In this specific case, the difference between the intrinsic value (based on weight) and the value by tale caused the overvaluation of worn Spanish-American silver. As coins wore thinner, they began to weigh less than full-weight or freshly minted coins. Although coins wore thinner and thinner, however, their value remained at par with full-weight coins. When given the choice to pay with a worn coin or a full-weight coin of equal value, the economically wise strategy was to pay with the worn and lightweight coin. The larger the discrepancy between the two currencies, or the more worn the coins became, the quicker this process occurred.

Both consumers and merchants began to recognize that significant amounts of value had gone missing in the Spanish-American coinage and began to take action. In 1852, Mint Director George N. Eckert lamented over “the worn Spanish coin which now monopolizes our circulation.”220 No longer using traditional money scales to find the weight of each underweight piece, most believed that a revaluation of the coins proved the easiest method to regain the lost value—to make, for instance, a one-real coin no longer worth 12½ cents, and so on. Aside from stopping the loss of one-half cent on many transactions for consumers and merchants, this also made the Spanish-American silver akin to the values of the domestic coinage and, thus, decimalized the majority of coins in circulation. This was a major step toward pushing consumers and merchants to remove shillings and pence from their vocabulary, and to begin to think solely in terms of dollars and cents. By the 1870s, most people and companies had

completely shifted their pricing strategies away from a fractional dollar, and into the
decimal form of the United States monetary system.

Those who kept full-weight coins from circulation either melted, hoarded, or
exported them. In 1853, the New York Herald reported, “This state of things has
banished almost entirely from circulation all silver coin of full weight, and what little
remains in the hands of the community consist principally of the worn pieces of
Spanish coinage of the fractional parts of a dollar, all of which are of light weight, and
many of them ten to twenty per cent below their nominal value.”221 In this case, much
of the full-weight coinage left the United States. Perhaps the largest drain of silver
from the United States, trade with China required full-weight Spanish-American
dollars, which even demanded premiums compared to other coins. If an American
merchant exported $1,000 in worn Spanish-American silver, he or she would have less
purchasing power than if that person exported $1,000 in full-weight Spanish-American
silver. When collecting funds in the United States, merchants generally opted to export
full-weight coinage, leaving only the worn pieces behind. While merchants and
consumers in the United States generally accepted Spanish-American silver by face,
regardless of weight, the Chinese weighed each piece individually. Chinese merchants
often littered individual dollar coins with their private “chopmarks” after they
received, weighed, and agreed upon the value of the coin. Throughout the 1820s, an
average of nearly nine million Spanish-American dollars per year left the United
States for China.222 This was a time when the Mint Director admitted that the United

221 “Mint,” 6.

222 The Asiatic Journal and Monthly Register, Volume 23 (London: Parbury, Allen, &
Co., 1827), 682.
States Mint only had the capacity to coin about three million dollar in silver per year.\textsuperscript{223} China was not the only location for the exportation of Spanish-American silver from the United States. In 1857, \textit{The Cecil Whig}, of Elkton, Maryland, reported that “the balance of trade with Cuba is against this country, and much specie has to be sent thither to square the account, we suppose there is no necessity for much loss on these small Spanish coins, which must no doubt be taken at par in Havana.”\textsuperscript{224} The circulating medium of the United States wore thinner, as full-weight Spanish-American and freshly-struck United States coins left the country.

A widely published Mint Assay of 1842 brought the depreciated state of Spanish-American silver to the attention of shoppers and merchants. While most individuals seem to have been generally aware of the losses associated with a worn coinage, the assay showed gross losses that were unavoidable. Fips (6\textcent{\textfrac{1}{4}}) were worth, on average, a mere 5.1 cents; levies (12\textcent{\textfrac{1}{2}}), only 11.1 cents, and quarters (25\textcent{}), 23.5 cents—depreciations of 18.4\%, 11.2\%, and 6\%, respectively.\textsuperscript{225} Because of the profits associated with hoarding full-weight coinage and those earned through Chinese trade, “fips, levies, and all that class of defaced, worn and bent chincapin money” were all


\textsuperscript{224} “Depreciation of Spanish Coin,” \textit{The Cecil Whig} (Elkton, MD), January 31, 1857, 2.

\textsuperscript{225} “Money Matters,” \textit{Sunbury American and Shamokin Journal} (Sunbury, PA), April 15, 1843, 2.
that remained in circulation.\textsuperscript{226} A “number of spurious fips and levies, of the Mexican stamp” dumped into Philadelphia in 1844 did not help the situation.\textsuperscript{227}

In the early 1840s, the value of Spanish-American coinage began to decline. For decades, the Post Office Department had priced the postage of letters in fractional terms. To send a letter from New York City to Albany, a customer needed 12½ cents. To send one to Troy, he or she needed 18¾ cents—sums that did not exactly conform to the United States dollar. In 1843, the \textit{New York Herald} reported, “The rates of postage in the United States have not only been exorbitantly high, but have been fixed to suit the worn out and depreciated Spanish fractions of a dollar floating among us, rather than the national decimal coinage of the United States.”\textsuperscript{228} This had “not only led to great inconvenience and vexation to the people,” but had also proven a “loss to the department. Why such an absurdity was enacted, or persisted in, no one can tell.”\textsuperscript{229} A correspondent from the \textit{Boston Courier} proposed “a concerted effort should be made to reduce the Spanish fractions of dollar to the same value with our coin or drive them from circulation altogether. By putting the fips and levies on par with our dimes and half-dimes, the object could be easily accomplished.”\textsuperscript{230} By late 1845, the Post Office Department had “come to the conclusion to receive only American coin in

\textsuperscript{226} “Smooth Fips and Levies,” \textit{Evening Star} (Washington, DC), August 15, 1856, 3.

\textsuperscript{227} “Bad Change,” \textit{The Whig Standard} (Washington, DC), August 19, 1844, 2.

\textsuperscript{228} “Postages and the Post Office Department—Reduction of Rates,” \textit{The New York Herald}, September 11, 1843, 2.

\textsuperscript{229} Ibid.

\textsuperscript{230} “Fips and Levies,” \textit{American Republican and Baltimore Daily Clipper}, June 6, 1845, 2.
payment for postages, or when desired to receive foreign coin to take it at its weight and value only, instead of its denomination as hitherto, say fips, levies and quarters, as half dimes, dimes, and twenty-three cents.” In 1851, one concerned individual suggested that the Postmaster General should sell the “half-worn Spanish 6½ cent pieces” and the “eight-cent pieces, pistareens, and short quarters or twenty-cent pieces,” which had become “almost a nuisance,” to the silversmiths of Washington D.C. The latter, short of silver plate, had taken to “melting down the coinage of the country,” which added to the loss of genuine, full-weight, domestic coinage in the money system.

Bankers also began to lower the rates at which they accepted Spanish-American silver coinage. As early as April 1843, the Jeffersonian Republican of Stroudsburgh, Pennsylvania, reported that “the rule adopted by the Banks and Brokers in the cities…has not yet been extended to Stroudsburgh, [where] these old-fashioned coins pass as freely here as ever, at their nominal value.” The reduction of rates for Spanish-American silver evidently first occurred in urban centers like New York City and Philadelphia before catching on in small towns and rural areas. Similarly, the development occurred first at bigger institutions, such as banks in large cities and the Post Office, before smaller businesses followed. While the big banks began to accept Spanish-American silver at reduced rates, the “Butchers, Grocers, and nearly all the

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231 “American Coin,” American Republican and Baltimore Daily Clipper, August 2, 1845, 1.

232 “Obsolete Coin,” American Telegraph (Washington, DC), July 24, 1851, 2.

233 “Fips, Levies, and Quarters,” Jeffersonian Republican (Stroudsburg, PA), April 26, 1843, 2.
dealers, however, take them at the old rates.”

Like the Post Office Department, the banks of Philadelphia and New York began to accept worn Spanish-American two-real coins (25¢) for 23 cents; one-real (12½¢) for 10 cents; and the medio-real (6¼¢) for 5 cents. While the Jeffersonian Republican reported in 1843 that the worn Spanish-American silver coins “in the cities…are fast disappearing, and getting out of circulation. They are sent to the Mint to be re-coined into dimes, half dimes, and quarter-dollars, our own currency, which will shortly supply their place.” This initiative, however, did not fully eradicate Spanish-American coinage from circulation.

In 1850, seven years after that prediction, the Jeffersonian Republican still complained of the “Spanish type, now and so long infesting our currency.” That same year, the Washington newspaper The Republic reported that “The country is weary of the worn-out Spanish money…The ‘fips, levis, and quarters,’ which, for the last century nearly, have had so prominent a place in its currency, and which are ill adapted to our decimal system.” Throughout the first half of the decade, postmasters and bankers lowered their rates again and accepted the Spanish-American coins for five, 10, and 20 cents each. Urban tradespeople followed suit, or refused to

234 “Money Matters,” Sunbury American and Shamokin Journal (Sunbury, PA), April 15, 1843, 2.

235 “Fips, Levies, and Quarters,” 2.

236 “New Coins,” Jeffersonian Republican (Stroudsburg, PA), June 20, 1850, 2.

Public concern grew. One worried individual in Washington, D.C. hoped that Congress could do something to “prevent the unpleasant feelings that so frequently arise in paying out and receiving this old portion of our currency.” Another, concerned with the rate “by which the poor man is now swindled out of four cents upon the dollar in all his small purchases,” asked “Will not the House of Representatives devote the ten minutes of time needed to perfect this most desirable measure?”

The public clearly wanted the government to act on Spanish-American coinage. This especially hurt individuals living in rural regions, where metallic currency was more stagnant—therefore, less likely to receive new United States coins to make the correct change—and where wages were lower. From the 1790s to 1830, the average wage for a rural male agricultural worker outside of Philadelphia was about 40 cents per day. A four-cent loss on a single transaction equated to as much as 10% of his wages.

Beginning in 1848, the gold rush in California added another dimension to the situation, eventually helping to alleviate the problem of worn Spanish-American silver. As massive amounts of gold entered the monetary supply in the matter of a few years, silver, when compared to gold, became relatively rare. This disrupted the

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240 “Smooth Fips and Levies,” 3.

legally fixed ratio between the two throughout the world, but especially in the United
States. As early as 1851, both consumers and merchants felt Gresham’s Law take hold
once again as they saw both foreign and domestic silver coinage as more valuable, in
relative terms, than gold. While a gold dollar and a silver dollar still legally contained
a dollar in purchasing power, the value between the metals had drifted apart. Silver
had appreciated by a full three percent over gold to the point that a silver dollar
contained $1.03 in intrinsic value, while a gold dollar remained the same. In 1852, the
Mechanics’ Magazine reported, “That the present relative value of our gold and silver
coin requires some change there can be little doubt.”

Silver coinage disappeared from circulation—the heaviest coinage first, and
the light-weight coinage soon to follow. Petitions arrived to Congress en masse,
“praying for the adoption of measures to relieve the community from the
inconvenience resulting from the scarcity of silver coin.” Congress passed the
Coinage Act of 1853, which issued a debased silver coinage to replace the worn
Spanish-American silver, only the worst of which remained in circulation. The new
silver coinage needed to have less value than the silver coins struck prior to the gold
rush. Initially, Treasury Secretary Samuel D. Ingham had proposed keeping the weight
the same, but with more copper added to the silver, or “alloyed with a heavier
hand.” However, the Coinage Act of 1853 kept the composition the same, but


(Washington, D.C.: 1851), 221.

244 “Scarcity of Silver Coin,” *American Telegraph* (Washington, DC), September 8, 1851, 2.
lowered the weight of the coins, by a drop of about 6.8% in each denomination. The Mint began to collect as many Spanish-American silver coins as it could to turn into the new reduced-weight United States half dollar, half dimes, dimes, and, especially quarter-dollars. [See Figure 24]. A set of arrows flanked the date to distinguish the reduced-weight coinage from those of earlier years. The quarter- and half-dollar, additionally, sported rays that represented light from behind the eagle on the reverse. The one-dollar coin, however, retained its original weight to contend on the international market and stay at par with the Spanish-American and Mexican silver dollars that continued to dominate world trade.245 “One good result of this,” Ingham declared, “will be the eternal banishment of Spanish fips, levies, and quarters, and the exclusive circulation of our own decimal coin.”246

Mintage records show the impact that the Coinage Act of 1853 had on the amount of domestic coin in the monetary supply. While it lowered the weights of the half dime, dime, quarter, and half dollar, the Act aimed at replacing the small Spanish coins that had been “rendered of doubtful value from obliteration” with the domestic equivalents.247 For example, the Mint struck 15,210,020 reduced-weight quarters in 1853—more than every year since 1796, combined, and a number that the Mint would not reach again until 1876. Half dimes and dimes hit similar benchmarks, and the


246 “Scarcity of Silver Coin,” 2.

Mintage statistics for both denominations put the number of coins struck in 1853 alone equal to those struck from their inception (1792 and 1796, respectively) up to 1837. The Mint struck 13,120,000 half dimes in 1853—more than any other year during their production between 1792 and 1873.\textsuperscript{248}

However, unhappy with the lightweight foreign coin in circulation, many considered the reduced-weight coinage an unacceptable substitute. By 1855, much of their circulation came to halt. On June 12, the \textit{Alexandria Gazette} reported that “this small change has become a drug. People will not take it…Orders have been issued to suspend the coinage of quarters and halves, and the operations of the mint are much reduced.\textsuperscript{249}” Despite striking millions of new coins for circulation, most people were not inclined to accept a debased silver coinage. Certainly, the Coinage Act of 1853 helped, but it did not allow United States coinage to completely replace the Spanish-American fips and levies. Along with the addition of the reduced-weight coinage, the worn out Spanish-American silver coins also reappeared in circulation. At the onset of the silver crisis, their reduced weight—caused by years of circulation and wear—permitted them to circulate for a while after full-weight silver coinage disappeared. For the same reason, they were the first to return. In several places, these coins returned quicker than the new United States coinage had the opportunity to fail, coming out of private hoards throughout the country.

Despite the attempts to rid the monetary system of Spanish-American coinage, the 1830s to the 1850s witnessed the apex of popular usage of the shilling-pence


\textsuperscript{249} “Silver Change,” \textit{Alexandria Gazette}, June 12, 1855, 2.
method for everyday transactions. Examples of this pricing structure appeared in account books and newspapers more often than any other time period since the creation of the United States dollar. Furthermore, some individuals and businesses during this period also created physical representations of these denominations. In 1835 and 1836, the Corporation of Philadelphia issued tokens with the denomination of “one shilling.” In 1837, private diesinker R.E. Russell, of New York, struck a token in German silver that stated “I.O.U. 12½c.” From 1852 to 1854, diesinker Thomas L. Clark of New York City struck brass and copper tokens for Moss’ Hotel, on the corner of Bowery and Bayard. [See Figure 25]. These tokens ranged in denominations from six pence (6d.) up to four shillings (4s.) and could be used for various services and meals offered by the hotel and restaurant. The designs were simple, and one side featured a prominent fraction that denoted the denomination, such as “2/6” with no other design or inscription. Sweeny’s Hotel, the Smithsonian House, and other hotels throughout New York City issued very similar tokens. The Sachem Oyster Saloon, at 175 Bowery, simply struck its name onto the coins, as many small companies did during this period [See Figure 26]. Presently, numismatists are aware of only six of these coins. All are on two-reales coins except one on a one-real piece. In the 1850s, an individual, likely William W. Long of Philadelphia, issued a variety of tokens, each with a value, and the inscriptions “Pay at the Bar” and “W.W.L.” The values were 6¼, 12½, 18¾, 31¼, 44, and 50, albeit without any true denomination (i.e. “cents”). He even overstruck some on genuine United States half-cent coins.  

In 1856, disturbed by the state of the remaining shillings and half shillings in circulation, Congress ordered the Philadelphia Mint to perform a special assay on the Spanish coinage in circulation. In April, the Evening Star reported on the condition of the coinage in the capital:

There is probably no other city in Uncle Sam’s wide dominions so flooded with depreciated Spanish small coins—‘fips’ and ‘levies,’ worn down ‘to the third nick’—as Washington; no place where such miserable, thin, bent, crossed, worn-out specimens of silverdom would be offered or received as currency, and it is consequently with no small satisfaction we see the movement lately made in Congress to do away with this tinware and substitute the American dimes and half-dimes. 251

The assay found that the average Spanish-American quarter weighed a value of 23½ cents, one-real or levy weighed 10⁹/₁₀ cents, and a half-real or fip weighed 5½ cents—painfully similar to the 1842 assay that first raised awareness of the situation. The problem was simply one of wear, as the assay found that those which were “not defaced or clipped, are, in reality, worth something more than the American.” 252

While Congress weighed the options in relieving the nation of a worn coinage, the Raftsman’s Journal of Clearfield, Pennsylvania reported that, “in the meantime speculators in the cities are already at work scaring people into parting with them at 20, 10 and 5 cents. Our advice is, unless much defaced, to keep them, or part with them only for what they are really worth.” 253 In addition to the corrections gained

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251 “Chincapin Money,” 3.

252 Lewistown Gazette (Lewistown, PA), February 12, 1857, 2.

253 Raftsman’s Journal (Clearfield, PA), February 4, 1857, 3.
from intrinsic loss, many consumers and merchants welcomed the decimal system and the practice of “shaving” four percent off every dollar.

Congressional debate on the subject began anew in 1856 when Senator Hamilton Fish (Whig–NY) requested that “the Committee on Finance enquire whether the smaller Spanish silver coins may not be removed from circulation, or have a value established by law to accord with their intrinsic value, and to avoid fractional parts of a cent.” The goal was twofold: to remove Spanish-American silver coinage, and to better conform the circulating currency to the decimal system. Senator Robert M.T. Hunter—chairperson for the Committee on Finance—quickly responded with the death knell for these coins on March 25, 1856, when he proposed bill S.190. Not only did he previously author the Coinage Act of 1853, but much of his career had focused on the economic issues of the era, including the founding of the San Francisco Mint and attempts at peaceful economic negotiations between the antebellum North and South. During the Civil War, he sided with the Confederacy, where his picture graced the 10-dollar paper note. After the reconstruction of the Union, he served as the Treasurer of Virginia and then Collector for the Port of Tappahannock until his death in 1887. Throughout the 1856 and 1857 amendments of bill S. 190, Hunter directed Congress through the process—motioning when and how many times Congress should read and print the bill, when the bill should move back to the Committee on Finance for further deliberation, and when the bill moved on to a vote. His expertise on the


issue was vital for the final move towards the passage of bill S.190, what became the Coinage Act of 1857.

This Act resulted in the continued legal circulation of Spanish-American silver for another two years at the relative value of 5, 10, and 20 cents, after which they officially departed from the United States monetary system. In January 1857, the Star of the North of Bloomsburg, Pennsylvania celebrated the fact that “Fips and levies have had their day,” and the pending use of “our own decimal currency, the prettiest and most convenient currency we can have.” Beginning on February 25, the Mint accepted worn Spanish silver coinage in exchange for a redesigned one-cent piece, smaller in size and easier to transport. [See Figure 27]. The Philadelphia Bulletin provided readers with an eloquent description of the days’ events. The Mint opened two windows. Below one read a sign, “CENTS FOR CENT,” and under the other, “CENTS FOR SILVER.” The former window accepted old copper cents, while the latter received worn Spanish-American silver in exchange for the new copper-nickel cents. “Every man and boy in the crowd had his package of coin with him,” the Bulletin reported, in return for “the diminutive little strangers.” The Mint received the worn silver in quantities of not less than five dollars, but not more than fifty dollars, in exchange for the new cent. If a package of five dollars ($5.00) by face

256 “Chincapin Money,” 3.

257 The Star of the North (Bloomsburg, PA), January 28, 1857, 2.

weighed more than the legal weight of four dollars and 80 cents ($4.80), the Mint paid the individual the five dollars. The Mint set similar benchmarks for five-dollar bags that weighed the equivalent of four dollars and fifty cents ($4.50), as well as four dollars and thirty cents ($4.30). It officially rejected any coins that weighed less. However, the West-Jersey Pioneer of Bridgeton, New Jersey reported that “All coins weighing less than these rates will be received at another part of the building, at a reduced value.”

Shifting Prices Away from Shillings-Pence: the Late-19th Century

On March 16, less than one month after the passage of the Coinage Act of 1857, E. Meriam, correspondent to the Philadelphia Evening Bulletin, wrote in his published travel accounts about the limited reach of the Coinage Act, at least in Franconia, New Hampshire:

After breakfast to-day, which consisted of cold meat, iced water and dry bread, I took a walk, holding a piece of silver (a Spanish quarter) in one hand with a tight grasp, the other hanging down by my side. The hand holding the silver became very cold and benumbed, but by stopping at a grocery and getting the quarter changed into two dimes and a half dime, I was relieved. It appears that the news of the new coinage act has not yet reached Franconia, and this is another advantage of this isolated place.

Officials and non-officials alike, however, saw the Coinage Act of 1857 as an effort that required help from local merchants. Perhaps the grocer in Franconia had read one
of the many reminders published in newspapers throughout the country and had simply heeded to the pleas of his customers. Only a few months after the passage of the Act, for example, the *West-Jersey Pioneer* published a notice that such a scenario would help resolve the problem:

> We presume our citizens will willingly aid the general government in getting them out of circulation. Those in business have it in their power as a general measure, to get them into the hands of the government. By receiving them at par in exchange for their goods, and not paying them out again to their customers, they can eventually clear the country of them altogether…The interests of all classes of the community would be much promoted by the change. We do hope therefore that our business men instead of handing out the foreign coin in change to their customers, and keeping the American, will reverse their practice and pay but the American quarters, dimes, and new cents, and send the others to the mint.261

Throughout 1857 and 1858, the majority of Spanish-American silver coins in circulation made their way to the Philadelphia Mint, as well as to satellite mints in New Orleans and San Francisco. The *Evening Star* reported that “the trading public of the District of Columbia are slowly coming to conform to the change in the currency system legislated not long since by Congress, in driving out of circulation, for the most part, all Spanish silver coin.”262 In 1859, Junius Spencer Morgan, partner of Peabody & Co. bankers, noted that “during the last twelvemonth considerable progress has been made towards the exclusive use of the legal system.”263 Mintage records indicate the same. For example, the Mint struck 7,280,000 half dimes in 1857, second

261 “Spanish Quarters Levys and Fips,” 2.
only to 1853. In 1858, the New Orleans Mint struck more coins of any single
denomination than ever before at that institution (until 1883), and more half dollars
than any United States mint in any given year (until 1876), with 7,294,000 half
dollars.

Although the goals of the Coinage Act of 1857 were met fairly rapidly, it took
consumers and merchants far longer to change their habits of retail reckoning. Two
months after passage of the law, one writer predicted that, “though the inconvenient
Spanish currency has departed, we must continue to put up with its nomenclature and
its ideality of value, for a long time to come, we fear.”264 In April 1857, the Evening
Star reported:

While a worn-out ‘fip’ or ‘levy’ is becoming a rare sight in trade here, few besides the retailers of ‘the ardent’ among us have adopted their scales of prices and quantities to the so capital change in the currency. That, however, must be a work of time—almost as difficult to be effected as to change a nation’s tastes and character; for it is to be an almost entire change of the nation’s habit in a matter of hourly practice through life. Of late, we have read many newspaper homilies levelled at the merchants for failing to conform their scales of prices to the new currency.265

Despite the rapid reduction in the amount of Spanish-American silver in circulation—or, perhaps, because people found opportunity during the transitional period at hand—even the process of shaving continued, albeit in decimal form. In August 1857, the Evening Star of Washington, D.C. reported that many individuals, “especially the country people…inaugurated a regular shaving business; and unless one prepares

264 “The Decimal System,” 2.

265 Ibid.
himself, before he starts to market, with a good supply of five and ten cent pieces, and
coppers, he is sure to find himself shaved to the tune of from one to six per cent. on all
his purchases.” As late as 1859, the Decimal Coinage Commission of Great Britain
observed that “the precise extent to which the dollar and cent system of accounts
has…superseded the old modes of reckoning, is differently represented by different
witnesses.” Some witnesses saw a substantial decline in their use, while others had
still not seen the dollar-cent system completely supersede the old mode.

Some areas were slow in recognizing the Coinage Act of 1857. Despite the
federal legislation that ensured its departure from circulation, local jurisdictions
continued to pass acts that set the value of Spanish-American coin. On September 5,
1857, for example, the Bridgeton City Council in New Jersey resolved that “We, the
citizens and business men of Bridgeton, do pledge ourselves that we will only take the
Spanish coin for the following rates: Quarters for 20 cents, Levies for 10 cents, Fips
for 5 cents.” Yet on the same day, Joseph H. Elmer posted in the West-Jersey
Pioneer that “The fourth annual Exhibition of Cumberland County Agricultural
Society, will be held at Bridgeton, on Wednesday Sept. 30. Spanish Quarters, Levies,
and Fips will not be taken for Admission Tickets, for more than 20 cts. 10 cts. and 5
ccts.”

266 “Georgetown Affairs,” Evening Star (Washington, DC), August 4, 1857, 3.
268 “The Old Currency,” West-Jersey Pioneer (Bridgeton, NJ), September 26, 1857, 2.
269 “Annual Exhibition,” West-Jersey Pioneer (Bridgeton, NJ), September 26, 1857, 2.
Though instigated in London, the Panic of 1857 worsened when the *SS Central America* sank off the coast of the Carolinas, along with 30,000 pounds of California gold. This economic downturn caused an increased demand for hard currency, but resulted in a shortage that lasted until 1861 in some areas of the United States. Many accepted the Spanish-American coins once again, and some did so at a heavy markup out of desperation. In December 1857, for example, the *Lewistown Gazette* in Pennsylvania reported that after the New Year, the deliverer of the newspaper, “in consideration of the ‘hard times’ is willing to take quarters where he used to get halves—levies where he got quarters—fips where he got levies.”

270 Similarly, merchants in Sunbury, Pennsylvania in 1861 resolved to accept the Spanish-American type at those same prices, arguing that they were “compelled to do in self-defense as these coins were brought from a distance for circulation.”

271 By the end of the Civil War, the old, worn Spanish fips, levies, and quarters had left circulation in the Northeastern regions of the United States. Without the Spanish-American coins, it was only a matter of time before the British names disappeared as well. The *Schoolday Visitor* lowered its cost from 12 cents to a decimalized 10 cents in the early 1870s.

273 Still, a potter from Philipsburg,

270 *Lewistown Gazette*, 2.

271 “Spanish Coin,” *Sunbury American* (Sunbury, PA), March, 23, 1861, 2.

272 They continued to circulate in some areas of the United States, notably the American Southwest, into the twentieth century.

Pennsylvania sold his quarter jugs for 12½ cents as late as January of 1873. On May 28, 1874, paper salesman Rufus Lipe of Fort Plains, New York sold Simean Failing ruler paper priced at one shilling per ream. [See Figure 28]. By 1875, the editors of *The Elk County Advocate* of Ridgway, Pennsylvania did not know of anyone who used the old method, and noted that “it is only a few years since New Englanders were accustomed to reckon by shillings of one-sixth of a dollar each, New Yorkers by shillings of one-eighth, and Pennsylvanians by shillings of one-seventh of a dollar.” Certainly, the last known commercial publication that spoke in shillings and pence dated from the same year. However, in 1884, the editors of *The American* felt that:

> The boasted system of coinage is not genuinely popular, as was shown by the popular desire to cut up the dollar into halves, quarters, ‘levies,’ and ‘fips’ instead of dimes. Nothing but government pressure forced the discontinuance of this kind of sub-division, and no coins would be more popular with the American people than ‘levies’ and ‘fips,’ if our mint would coin them.

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They ended this opinion with “the assertion that John Bull’s pounds, shillings, and pence are better adapted to the wants of plain people that our decimal system is.”279

Furthermore, in 1895, Charles T. Tatman noted that “In some parts of New York and New England may be found to-day people who still reckon in shillings, and any of them will tell an inquirer the ‘York State’ shilling is twelve and a half cents, and that the New England shilling is sixteen and two-thirds cents.”280

Some regions used the old shilling-pence method into the twentieth century. This is especially true in the rural regions, where it took a new generation of merchants and consumers to fully commit to the decimal monetary system. As late as 1907, Charles A. White found that most people in New York still understood the earlier monetary terms, although people no longer used them as regularly since the disappearance of Spanish-American coin from circulation. In rural areas of Pennsylvania and New Jersey, White found that consumers and merchants still spoke of levies on occasion, and sometimes this happened even in city-center market places. Other terms, such as “‘fip,’ or ‘fipny bit,’ seem to have gone entirely out of use in the regions where it originated, and to exist only in the memory of older people.”281 With the memory long forgotten, the state of New Hampshire only officially retired this archaic nomenclature from its state constitution in 1950, with the passage of the New

279 Thompson and Barker, 309. John Bull is an allegorical representation Great Britain, much like Uncle Sam.


281 White, 100–101.
Hampshire Money in Shillings and Pence Amendment—a popular referendum which only succeeded by fewer than 2,300 out of 90,987 votes.\textsuperscript{282}

**Conclusion**

The circulation of Spanish-American coinage from the early 1600s to the 1860s in the Mid-Atlantic States and New England caused the extended use of terms such as *shilling* and *pence* within the vernacular of English-speaking Americans. As the meaning of each term varied from place to place and often caused confusion for travelers, pricing structures in the different regions largely reflected these differences. Prices of 12½ cents in New York, 13½ cents in Philadelphia, and 17 cents in Boston became very common. In some places, this lasted until the beginning of the First World War, and at least one official document used these terms until after the Second World War. This trend reflected the early factions that contended over the implementation of a national government—federalists made up of urban businessmen and merchants, and antifederalists consisting of rural farmers. Urban areas experienced the complete transition from shillings and pence to dollars and cents before the rural regions of the country, where foreign coinage had more long-lasting effects on how consumers and merchants discussed money and performed business.

The coins in circulation wore further, and as time passed, their physical condition led to a greater monetary loss per coin. By the 1840s and 1850s, some coins were 25% lighter than they began. American banks, post offices, and merchants responded with a price structure that not only adjusted for the intrinsic loss of the

Spanish-American coin, but also more closely paralleled the domestic decimal system of the United States dollar. Through the same period, the Philadelphia Mint received the physical and technical upgrades needed to supply the growing nation with United States coins. These initiatives ultimately helped push the monetary system of the United States closer to full decimalization, based on dimes and cents. By the passage of the Coinage Act of 1857, Congress deemed that Spanish-American silver no longer had a part in the United States monetary system, and consumers and merchants quickly removed the coins from circulation overall. By the 1870s, while most people defined the United States monetary system in a unified structure of dollars and cents, some rural populations continued to reckon prices for items in shillings and pence up to the First World War.
Figure 18  A one-dollar bill issued by the Continental Congress on November 29, 1775. "This Bill entitles the Bearer to receive One Spanish Milled Dollar, or the Value thereof in Gold or Silver, according to a Resolution of Congress, passed at Philadelphia." These bills helped pay for the American Revolution. American Numismatic Society, 1989.44.1.
Figure 19  Spanish-American one-real coins, among the more ubiquitous coins in circulation throughout the early 19th century in the United States. (top) Worn Spanish-American one-real coin, 1791. ANS 1947.47.321.; (top) Full-weight Spanish-American one-real coin, 1797. ANS 1986.73.52. Note the lack of detail on the top coin, missing letters, and rim worn into the field of the coin.
Figure 20  Cut Spanish-American dollar, equal to a quarter dollar. This was a common method to provide small change when the correct coins were otherwise unavailable. American Numismatic Society, 1923.51.9.

Figure 21  January 3, 1803, cabinetmaker John Doggett of Roxbury, Massachusetts sold Nathan Lazell “3 picture frames 21 by 20 at 12/ … 6.00.” John Doggett, Papers, 1. The Joseph Downs Collection of Manuscripts and Printed Ephemera at the Winterthur Museum, Garden & Library, Collection 330.
Figure 22     Methods used to teach children how to deal with state shilling and pence. Roswell C. Smith, The Little Federal Calculator: Consisting of Questions and Tables to Employ the Mind and Fingers Only; Designed Particularly to go before the Slate and to Prepare for It (New York: Cady & Burgess, 1850), 35–36.
Figure 23  The steamship Joe Johnson allowed customers to pay with “a Virginia
ninepence, a Maryland levy, or a York shilling,” which were, in fact, the same amount
York Herald, August 26, 1845, page 3.
Figure 24  1853 Half Dollar. Note the arrows that flank the date (obverse) and the arrows that surround the eagle (reverse) that identified this as a reduced-weight coin. American Numismatic Society, 1907.21.1.
Figure 26  Silver Spanish-American one-real coin, counterstruck by Sachem Oyster Saloon, New York City, ca. 1830–54. ANS, 1969.222.4645

Figure 27  1857 Flying Eagle one-cent coin. The Philadelphia Mint struck 17,450,000 coins this year, and 24,600,000 the following year to help replace the worn Spanish-American silver coins that plagued circulation. American Numismatic Society, 0000.999.3313
Figure 28  May 28, 1874, Rufus Lipe sold Simean Failing ruler paper for one shilling per ream. Failing Family, The Joseph Downs Collection of Manuscripts and Printed Ephemera at the Winterthur Museum, Garden & Library, Collection 486.
Chapter 4

“EQUIPOISE IS LOST”: THE PROLIFERATION OF COUNTERFEIT AND LIGHTWEIGHT FOREIGN COINAGE, AND THE DIFFICULTY OF EVALUATING THEM

In the meantime the old man had drawn a huge bunch of keys from his pocket, and had deliberately opened the trunk before mentioned, at the top of which were sundry yellow canvass bags of specie; he next fitted a pair of spectacles on his nose, and then raising the cover of the table, he drew out a drawer containing a pair of scales, and began to weigh his guineas, as if to make a show of that of which he had none,—honesty.  

In Mary Martha Sherwood’s novel, *Shanty the Blacksmith* (1835), a shyster known only as “the old man” makes several attempts to excuse himself from a long-overdue debt. As his creditor demanded the unsettled sum and yelled out in “high and honourable indignation,” the Old Man knew the one object that would bring the argument to an end. As if Lady Justice herself had entered the room, the set of money scales that he lifted from the drawer all but satisfied the demands of his creditor, who then made “no question but that his honourable reasonings had prevailed.” The mere sight of the scales calmed him. He was about to receive what was his—or so it seemed. The old man, however, was still a fraud who had deliberately presented the


284 Ibid.
scales “as if to make a show of that of which he had none.” Despite the balancing act, the old man knew that the guineas, the money scale, and the weights he held were spurious.

Although fictitious, the above incident was not far-fetched. In the United States through the 18th and 19th centuries, the circulation of foreign coinage facilitated the spread of counterfeit coins, as well as overtly damaged and lightweight coins, yet the instruments used to value them proved insufficient. The circulation of these coins impaired the trust that people held towards metallic money—higher percentages of counterfeits led to greater distrust. The range in quality of coinage from the various European and North and South American mints made it increasingly difficult to discern what was genuine and what was counterfeit. In 1805, for example, Philadelphia banker and Congressman Joseph Clay stated that “the foreign coin was so roughly executed as not to furnish a proper protection against counterfeits.”285 In addition to the need to identify counterfeit coins from various locations, consumers and merchants also needed to recognize the many different methods of counterfeiting. Not only did “counterfeit” coins include fake coins produced by illicit mints, but counterfeiters employed a variety of methods to extract value from genuine coins before passing them off as unadulterated.

Money scales represented one of the few objects available to individuals to thwart the circulation of counterfeit coinage. By giving consumers and merchants the ability to value suspicious coins, money scales were intended to reassure those who distrusted a coin. People expected to place a coin on the pans of their money scales to

reassure themselves that the coin was genuine. However, many scale users doubted the qualitative abilities of the money scales available to them and continued to feel unsure about the value of the coin. They distrusted these fragile and fickle instruments. Throughout the 18th and 19th centuries, many individuals complained of a lack of sensitivity, accuracy, and precision in money scales, as well as the accuracy of the accompanying money weights used to compare the coins. Unfortunately, money scales constituted the only method available to consumers and merchants in regards to valuing lightweight, counterfeit, and unrecognizable foreign coinage. In the years prior to the end of the circulation of foreign coinage in 1857 Americans began to devise other methods to determine the quality of their coinage, known as counterfeit detectors. Ultimately, however, the design and construction of the counterfeit detectors proved to have their own weaknesses and failed as acceptable replacements for traditional money scales.

Counterfeit and Lightweight Foreign Coinage in the United States

Throughout the 18th and 19th centuries, while American consumers and merchants understood the economic necessity of retaining foreign coinage in circulation, many knew that this came with an increase of counterfeit, lightweight, or otherwise adulterated coins. In 1782, Robert Morris noted that “where the coins are so numerous, that the knowledge of them is a kind of science, the lower order of citizens are constantly injured by those who carry on the business of debasing, sweating, clipping, counterfeiting and the like.”

286 In 1805, Joseph Clay admitted that “everyone

knew that there had been some years past a large quantity of bad money in circulation.”

Similarly, in 1845, Treasury Secretary Robert J. Walker felt that “it is more difficult, in common use, to distinguish the genuine from the counterfeit foreign coin,” and this problem only worsened as the variety of foreign coins in circulation grew. Several types of counterfeit and adulterated foreign coins plagued monetary circulation in the United States. These included outright counterfeit coins which used cheaper metals, and genuine coins that deceitful individuals altered through the techniques of sweating, clipping, plugging, or filling. Each of these constituted deliberate acts of fraud and represented financial losses to the consumers and merchants who discovered that their coins were counterfeit. Such coins circulated far and wide. In an archaeological study, John M. Kleeberg reports that counterfeit foreign coins originating from Great Britain, Spain and its American colonies, the independent nations of Central and South America, Portugal and Brazil, France, Ireland, and Denmark have been unearthed in the Mid-Atlantic States, New England, and beyond. One of the only ways that individuals could safeguard themselves against loss by rejecting a spurious coin before it was in their possession was through use of a pair of money scales. Honest and trustworthy merchants sometimes honored the damages a consumer experienced if he or she discovered a counterfeit coin at a later date. For example, on September 18, 1775 in Philadelphia, Joseph Whitle returned to silversmith Thomas Shields to receive “a Discount made in his part of Loss in

287 “Thursday, December 19,” 2.

288 United States Treasury Department, Reports of the Secretary of the Treasury of the United States, Volume 5 (Washington: John C. Rives, 1851), 19.
Counterfeit Doubloon as a gram”—a difference of one pound, 10 shillings (£1.10s.).289 [See Figure 29].

Counterfeiters produced their wares through a variety of means. Most of the time, a set of money scales could detect such pieces. Struck from a die or cast in a mold, counterfeit coins generally contained cheaper metals and weighed less than their genuine counterparts. The amount, however, varied from method to method, and from piece to piece. According to Dickerman’s Counterfeit Detector, the weight of cast-counterfeit coins was “very defective,” while die-struck counterfeits were only “a trifle short weight.”290 This was largely due to the physical reduction in size that the coin faced during the cooling process, porosity that naturally existed from the casting process, and voids or cracks that occurred in hastily-produced pieces. While die-struck counterfeits were less easy to detect, cast counterfeits cost less to produce and were much more prevalent in circulation. Most counterfeit gold coins typically contained platinum, silver, copper, brass, antimony, aluminum, zinc, type metal, or lead, though other metals also appeared. [See Figure 30]. Dickerman’s noted that the most dangerous gold counterfeits were composed of a gold, silver, and copper alloy, due to their similar appearance to genuine gold coins when new, but they were as low as 40% gold, as opposed to 90% as ascribed by law. Since the atomic weights of silver and copper are nearly half as heavy as gold, a money scale could usually detect such coins. Producers of silver counterfeits often used a mixture of antimony and lead, with

289 Shields, 8.

coins that were “only slightly below the standard weight,” while silver-plated brass counterfeits “lack required weight.”

Otherwise, to achieve full weight with lighter metals, counterfeitors needed to produce a counterfeit coin much thicker than a genuine coin.

Not all forged coins were outright counterfeits, however. Many began as genuine pieces. *Sweating*, for example, deceitfully removed trace amounts of metal from a coin, yet allowed it to retain the appearance of an honest coin—a form of artificial wear. Two very different methods of sweating existed. The first included placing a number of coins in a bag and vigorously shaking them for an extended period of time, which slowly left behind a small quantity of gold dust. Some deceitful individuals tied the bag to the axle of a cart or coach to save themselves from having to manually agitate the bag. If the bag was made of fine leather, counterfeitors could scoop out most of the gold dust. However, if he or she used a cloth bag, the easiest method of retrieval was to set the bag aflame and separate the gold dust from the ashes.

The second method of sweating consisted of soaking the coin in *aqua regia*—a three-to-one mixture of hydrochloric acid and nitric acid, and the only solution capable of diluting gold. Over the course of a few hours, enough gold atoms left the coin to make this operation profitable, without enough deterioration to the coin to raise alarm from an unsuspecting recipient.

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291 “The Different Methods of Counterfeiting Coin,” 47.


293 “The Different Methods of Counterfeiting Coin,” 376.
Watson specifically noted the large amount of sweating that took place in New York City, and that “an old gentleman told me, that he saw it often done there, when he was a lad, seventy years ago. It sweat off like water.”

Each of these three methods of sweating allowed a fraudulent individual to retain from five to 20% of the value of the coin before reintroducing it into circulation. This method proved extremely difficult to detect, and impossible to prevent. Nineteenth-century economist Thomas Cooper regarded sweated coins as “an evil necessarily connected with a gold currency.”

Clipped coins were another form of adulteration that plagued the circulation of foreign coinage in the United States. In 1805, Congressman James Clay, in a discussion on the deplorable state of foreign coinage in the country, mentioned a piece of “Portuguese gold [that] had escaped his attention—but it was so clipped and mutilated as scarcely to be considered as coin.” By 1840, Samuel Hazard, of Philadelphia, noted that most states throughout the Union “were exposed to an influx of the adulterated, worn and clipped coin of every country in Europe.”

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295 “The Different Methods of Counterfeiting Coin,” 47. Watson, 419.

296 Cooper, 764.


individuals clipped coins in two different manners. One method was to shave or clip the edge of a coin and pass the then-smaller coin off as normal. [See Figure 32]. The removed silver or gold was pure profit to the dishonest person. Numismatist Sim Ewe Eong notes that a coin could experience this several times, and become “progressively smaller as it passed from person to person while in circulation.”\textsuperscript{299} By the second quarter of 19\textsuperscript{th} century, as minting technology improved and reeded- and milled-edge coins replaced those with a plain edge, deceitful people, instead, began to file the edges off a coin, collect the gold dust, and manually remill the edges.\textsuperscript{300} The second method of clipping coins took advantage of the popular method of cutting gold and silver coins. A popular, legal, and accepted method of creating smaller denominations was to literally cut a larger coin in half, or even into quarters, eighths, and sixteenths. However, a deceitful individual would try to extract more pie-shaped fractions from a coin than was mathematically possible. In 1785, for instance, George Washington complained that “without some stop can be put to the cutting and clipping of money; our Dollars, pistareens &c. will be converted into five quarters; and a man must travel with a pair of money scales in his pocket, or run the risk of receiving Gold at one fourth less by weight than it counts.”\textsuperscript{301} Similar pieces of nine-eighths, or 17-sixteenths also circulated.

\textsuperscript{299} Eong, 59.

\textsuperscript{300} “The Different Methods of Counterfeiting Coin,” 47.

Other methods that individuals used to adulterate genuine coins were *plugging* and *filling*. These methods were similar to each other in that the deceitful individual removed the valuable metal and replaced it with some less valuable. A *plugged* coin had a hole drilled into its side, which was then plugged with the less-valuable metal. Once plugged, the swindler capped the hole with real gold and touched up the edge reeding. A *filled* coin, on the other hand, was cut in half along its edge, and the metal scooped out. The swindler filled the void with a cheaper metal and rejoined the two halves of the coin. Sometimes, platinum acted as a filler metal, since (at the time) it did not cost as much as gold. Due to similarities in the atomic weight of gold and platinum, counterfeit coins that used the latter metal proved difficult to detect. Coins filled with a cheaper metal yielded more profit for a fraudulent person, but were much easier to detect by weight. Generally, only larger coins succumbed to plugging, while swindlers could fill coins of most sizes. Plugging a coin could yield from one-eighth to one-sixth of its value (12.5% to 16.7%), while filling a coin could rob as much as 80% of the value.\(^\text{302}\) In the 1820s, individuals in New York City had much to complain about this issue, and found it “difficult now to obtain a shilling or two shilling piece that has not a hole in it, or otherwise mutilated.”\(^\text{303}\)

More often than not, foreign counterfeit coins originated from within the United States, rather than being imported. In particular, New York City and the surrounding area became a hotbed for counterfeiting operations of foreign coinage. On

\(^{302}\) “The Different Methods of Counterfeiting Coin,” 47.

\(^{303}\) “Interesting Gleanings,” *The Wilmingtonian* (Wilmington, DE), October 16, 1823, 3.
occasion, authorities discovered the actions of these individuals. In November 1828, for example, the *Journal of Commerce* mentioned that “It may not be generally known, that Spanish Doubloons are an article of considerable manufacture in this country.”

The article goes on to tell of an individual who tried to sell 60 of these “American Doubloons” to various brokers on Wall Street, who notified the police and had the man arrested. In this particular case, however, authorities tested the coins and found that the intrinsic value was similar to that of the genuine coin and set the individual free. By 1835, the *New York Spectator* proclaimed that “It is well known that a large quantity of counterfeit and base coin is annually manufactured in this city and parts adjacent.”

Similarly, in 1852, Officers Hogan and Clark made “one of the most important arrests” in New York City. “A gang of French and German men,” a “gang of dangerous counterfeiters,” and “rogues,” the article deemed the men who struck a variety of counterfeit United States and foreign coins in their rear basement, led by “the principal of the gang, named Louis Levin.” Authorities there discovered gold dollars, half eagles, and English sovereigns “so handsomely…executed that the


307 Ibid.
best of judges could not detect them, particularly the imitation gold dollars and sovereigns.”

One of the more spectacular discoveries occurred in June of 1835, when Marshal General Darcy, of Newark, New Jersey arrested English immigrant Joseph Gardner in the Belleville neighborhood for counterfeiting. In the cellar of the house, they found “a complete and efficient dye [sic] sinking establishment, tools, presses, and metal.” While listed as a diesinker by trade, “Gardner and his wife protested of course to be entirely innocent of anything like coining money.” Unconvinced, however, Darcy and company continued to search the premises. Within a few hours, they had discovered a pair of counterfeit dies to strike Spanish-American dollar coins in a stone wall under the barn. They found other dies, of different kinds, in a stone fence adjacent to the house. “One of the gentlemen,” the article noted, “observing a muddy spring hold at a short distance, thrust his hand in and pulled up a bag of spurious Haytian coin.” Further dies included French five-franc pieces dated 1831 and Mexican dollars of 1819. Evidence emerged that Gardner had recently sent a large quantity of counterfeit foreign coin the short distance from Belleville to New York City. Within some weeks, authorities located the Charles Denison, a small schooner from Belleville, docked in the harbors of New York City with 380 boxes, each

308 Ibid.


310 Ibid.

311 Ibid.
containing 1,200 counterfeit Brazilian “dollars,” for a total of 456,000 dollars. The coins were made of copper and plated with silver. 312

Such offenses appeared in newspapers to inform consumers and merchants of specific types of coins in order to help combat their circulation. Often, newspapers far and wide published such notices due to the wide circulation patterns that existed throughout the country. The initial discovery of the Belleville mint, for instance, appeared as far north as Concord, New Hampshire, and as far south as Washington, D.C. because these cities were within the circulating reach of New York City.313 Such counterfeit coins could affect individuals throughout this larger region despite the difference of hundreds of miles. People from Washington relied on such information for protection from the same exact coins as much as those in and around New York City.

Newspaper articles not only told of the busts of large-scale operations, but also of small-time counterfeiters that sometimes made a bigger impact on the average American. In 1835, for example, Peter Dallington of New York pleaded not guilty “on a charge of counterfeiting foreign coin of the value of the sixteenth part of a Spanish milled dollar,” or fips. While the hundreds of thousands of Brazilian coins struck by Darcy in Belleville could have easily reached an international merchant and left the country, the tiny pieces struck by Dallington would certainly have remained in local

312 “Spurious Coin,” New York Spectator, August 20, 1835.
circulation, as was the nature of small-valued silver coins once they arrived in the region.\footnote{United States Court,” \textit{Morning Herald} (New York City). September 4, 1839, 2.}

Although the Constitution granted Congress to regulate the value of foreign coin, they did not deem the act of counterfeiting foreign coins illegal until the Crimes Act of 1825. This act stated that “any person or persons [who] shall make…cause or procure…or willingly aid or assist in falsely making, forging, or counterfeiting, any foreign gold or silver coin” would receive a fine not more than $5,000 and imprisonment and condemned to not more than 10 years of hard labor.\footnote{Benjamin C. Howard, editor, “United States v. Marigold,” \textit{Reports of Cases Argued and Adjudged in the Supreme Court of the United States, Volume 9} (Boston: Charles C. Little and James Brown, 1851), 561–562.} Previously, the Coinage Act of 1806 made counterfeiting “current coin” illegal, though it did not specifically mention foreign coinage and led to confusion regarding the law. For example, in 1836 the Supreme Court heard the case of Joseph Gardner, indicted for passing a counterfeit pistareen—a Spanish-American silver coin worth about 20 cents. The Court found that Gardner would have committed a felony under the Coinage Act of 1806—when a pistareen held legal-tender status—but was not guilty under the Crimes Act of 1825 since “there being no such part as a twenty cent piece, or fifth of a dollar, we think the pistareen is not a coin made current by law.”\footnote{B.R. Curtis, \textit{Reports on the Decisions in the Supreme Court of the United States, Volume 12} (Boston: Little, Brown and Company, 1855), 273.} It is unknown whether or not Congressman William W. Ellsworth knew of the Crimes Act of 1825 when he proposed bill No. 568 to the House of Representatives in March of 1831 “to ________
prevent and punish the making and transporting the counterfeit foreign coin.”

Neither this bill nor similar bills proposed in 1838 and 1841 passed, though the Act of 1825 did remain in effect. The Supreme Court referred to and reaffirmed this law when they decided Fox v. The State of Ohio in 1847. The Court found Malinda Fox guilty of passing “a certain piece of false, base, counterfeit coin, forged and counterfeited to the likeness and similitude of the good and legal silver coin…called a dollar.” She served three years of hard labor at the State penitentiary.

In addition to counterfeit coins, individuals also grew concerned with genuine, but obviously lightweight coins. In general, lightweight coins bore their full weight when they began to circulate, and wore down in the course of economic activity. Individual transactions of the coin coalesced into years of circulation. [See Figure 19]. In theory, the longer a coin circulated, the more friction it received, the more it wore down, the less mass it contained, and the lower its worth. Even though wear resulted from human contact, contemporaries knew that wear from day-to-day circulation was not intentional, and went so far as to call it “natural,” “ordinary,” and “fair.”

Nevertheless, metallic loss equated to monetary loss, and most individuals chose to


318 Benjamin C. Howard, Reports of Cases Argued and Adjudged in the Supreme Court of the United States, Volume 5 (Boston: Charles C. Little and James Brown, 1847), 435.

weigh coins that appeared lightweight and their presence irritated people. In 1823, for example, a concerned individual with the pseudonym Argentum from Wilmington, Delaware complained of large amount of Spanish-American pistareens in circulation that “became worn and lightened by strong use.”

Coins of a higher intrinsic value faced greater scrutiny. In 1840, *Hunt’s Merchants’ Magazine* noted that “the weighing of gold, in particular, is an operation of some nicety [because] a small difference in the quantity makes a great difference in value.”

While friction caused a coin to wear down, what caused enough to impact the value of a coin? Monetary historian and Senior Economist at the Federal Reserve Bank of Chicago, François R. Velde states simply that “wear on coins is the result of many transactions between different parties.” While this explanation suggests monetary circulation, it only describes brief periods in the lifecycle of a coin. Actual monetary transactions were mere moments along a continual timeline of circulation. In 1852, British journalist George Dodd captured the elusive and destructive nature of monetary circulation when he postulated that:

> The wearing away of gold coin, by the constant friction to which it is exposed, is a curious matter both mechanically and financially. No one can say whither the worn particles go: the pocket, the purse, the skin of the hand, the wooden till, the metal cash box—all must rob the gold sovereigns of something of their weight; but we cannot see the process

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of diminution, nor catch the truant particles as they fly. Then, when
gone, somebody must bear the loss; and who shall this be? A baker
who takes a sovereign one day, and pays it away to his miller the next,
does not pay the veritable sovereign itself; it is a little lighter than when
he received it; and, although even Mr. Cotton’s exquisitely delicate
apparatus might not be able to detect the amount of deficiency, yet
deficiency there is, and several repetitions of it amount to an
appreciable quantity.  

Here, Dodd referred to the fine scale owned and often boasted about by Bank of
England Governor William Cotton, though supposed that even the finest scales could
not detect the near-constant rate of deterioration that all coins faced while in
circulation.

Generally, coins endured the most friction during periods other than those
suggested by Velde. The majority of circulation for a coin did not involve physical
exchanges between consumers and merchants. More often than not, coins wore down
in the time between transactions among people. In fact, a coin could wear dramatically
and never pass from one individual to another. As suggested by Dodd, the coin held by
the baker was “a little lighter than when he received it.” In effect, metallic loss of
coins occurred due to inefficient storage methods by individuals, rather than from the
collective commerce of many parties. Lightweight coinage became so from excessive
amounts of time in a pouch, a pocket, money bank, or a box; coins moved from side-
to-side, banging against one another and other hard objects. [See Figures 33 and 34]
Even after hundreds of transactions, to simply drop a coin into the relatively soft palm

323 George Dodd, “Gold: In the Mine, the Mint, and the Workshop,” in The
Curiosities of Industry and the Applied Sciences (New York: George Routledge &
Co., 1854), 16.

324 Ibid.
of another individual would not have imparted enough friction to impose the particularly great losses on gold and silver coinage from the period. Most economic exchanges were likely stress-free moments in the lifecycle of a coin; brief instances when merchants and consumers examined, counted, and appraised it; when it sat idle on a counter, carefully rested on the pans of a money scale, or was neatly stacked in a pile with other coins, only for its new owner to carelessly render it into the loose (and destructive) confines of his or her coin purse or chest.

Relatively speaking, an individual could recognize a loss in the value of a coin rather quickly. In 1773, The Providence Gazette published a commentary on the wear endured by gold coins in circulation:

According to Sir Isaac Newton’s calculation, a guinea loses in weight, by wear, the value of one farthing in a year; and consequently a guinea that has been current an hundred years, will be deficient in weight two shillings and a penny. It appears that Sir Isaac Newton’s calculation is pretty exact; because the guineas coined an hundred years ago, in the reigns of Charles and James the second, do generally want about two shillings in weight.325

Estimates of the effects of wear on gold coins continued to appear in print into the 1850s. In 1843, former member of Congress, professor, and author George Tucker suggested that “the quantity lost and consumed by the wear of the coin…may be set down at one-fourth of 1 per cent a year”—or 0.25 percent.326 An 1855-Boston Post article differentiated between gold and silver coins, and estimated that the former wore


326 George Tucker, Progress of the United States in Population and Wealth in Fifty Years, as Exhibited by the Decennial Census (New York: Press of Hunt’s Merchants’ Magazine, 1843), 208.
down one-twentieth of one percent per year (0.05%) while the latter wore ten times as fast, at one-half of one percent per year—or 0.5 percent. “In other words,” the Post article continued, “a gold coin kept constantly in circulation would last two thousand years before it would entirely disappear; a silver coin would last two hundred years; 900 new eagles outweigh 901 which have had one year’s circulation, 900 dimes outweigh 907 under similar circumstances.”

The Use of Money Scales to Identify Counterfeit and Lightweight Foreign Coinage

Due to the circulation of foreign coinage, counterfeit and lightweight coins proliferated more than if the nation had used only United States coins. Because of counterfeit and lightweight coinage, individuals used money scales. Whether a coin showed traces of wear, signs of adulteration, or threatened to be a counterfeit, money scales acted as one of the only methods available for their detection. Since genuine coins held a particular mass due to their specific metallic composition, and since most counterfeit and altered coins used cheaper metals to offset the value of the coin, the weight of a coin revealed its authenticity. Congressional debates reveal that Pennsylvania Representative Samuel Sitgreaves, in 1797, underscored the need for money scales to prevent the circulation of any coin “diminished by various means, such as sweating, plugging, clipping, &c.” and felt that “there was no method of ascertaining, with precision, the value of gold coin, without weighing it; and persons not in mercantile habits, and who were not possessed of a pair of scales, were at a loss

to know its value.” In 1834, Thomas Hart Benton noted that throughout the history of the United States, “a great influx of precious metals took place; doubloons, guineas, half joes, were the common and familiar currency of farmers and laborers, as well as of merchants and traders. Every substantial citizen then kept in his house a pair of small scales to weigh gold.” In 1851, United States Mint assayers, Jacob R. Eckfeldt and William E. Du Bois, concluded that “the great majority of counterfeits, new or old, deserve neither to be admired nor feared; and the fact of their obtaining any circulation proves folly on the one party, as much as roguery upon the other.”

In other words, as long as an individual weighed his or her coins, there was little need for concern.

From ancient times up through the mid-19th century, money scales—also called gold scales—were a specific type of equal-arm balance scale, which teetered from side-to-side based on the weight of the coins placed upon them. Most money scales consisted of several distinct components, each of them fully dependent on the perfect balance of the piece before. [See Figure 35]. Being “hand-held” meant consumers and merchants pinched a piece of string between the index finger and thumb of his or her less-dominant hand and raised the scale in the air. That string—passed through a loop at the top of the vertical frame—suspended the rest of the scale while allowing it to

328 The Debates and Proceedings in the Congress of the United States, 718.


hang freely. The bottom of the vertical frame held the balance beam, which rested parallel to the ground at equilibrium, but tilted to one direction or another when unbalanced. From the far ends of each brachium, or arm, of the beam that straddled the fulcrum, hung three silk strings of equal length. These strings suspended the pans onto which an individual placed the gold guineas and weights. The indicator, or tongue—attached perpendicularly to the top-center of the horizontal beam—told whether a coin was too light, heavy, or of correct weight by swaying with the beam. The weight of the entire scale plus the contents of the pans was known as the load—an important measure in determining the overall quality of the scale.

The exact point where the vertical frame and the beam made contact was of utmost importance to the entire system. Known as the fulcrum, it was where the knife-edge bearing of the beam precariously rested on the plane enclosed at the bottom of the frame. For the sake of accuracy, scalemakers employed the hardest and finest steel available for these components, and polished them to allow for the least amount of friction. The position of the fulcrum to the center of gravity of the money scale was dire for overall precision. Putnam’s Home Cyclopedia warned that, if incorrect, “the balance would become useless.” The ideal placement was for the fulcrum to rest

331 Technically, pans and scales are synonymous, with the latter getting its name from their passing resemblance to fish scales. While it is a misnomer to use this name for the entire contraption, this paper will continue to do so for the sake of consistency and to avoid confusion.


below the center of gravity of the beam in order to teeter or sway independent of minute weight deviations, and relative to proportional weight. If the fulcrum were located directly at the center of gravity, the beam would stay at rest in any position. This made finding equilibrium impossible since the beam would favor either extreme of measurement.\(^{334}\) Lastly, the condition of the fulcrum dictated the overall performance of a money scale. “In order that they may be preserved in their original state,” mid-19\(^{th}\) century engineer Luke Hebert reminded scale owners, “the beam is not suffered to rest upon its centre but when in actual use.”\(^{335}\) Scales grew more finicky over time unless maintained properly.

Unlike the arithmetic needed to convert foreign coinage, guiding information regarding money scale usage was sparse. Knowledge about when or how to use a money scale was not easily available. Generally, money scales did not come with instructions for use nor indicate which coins an individual should test. Texts from this period, such as *A Treatise on the Method of Weighing Gold and Silver* (1756) by Charles Sommers and *An Essay on Weighing of Gold, &c.* (1756) by William Symons contained some guidance, though they did not advise when someone should weigh a particular coin over another. Furthermore, these early texts—nor any text on the subject—did not circulate to a large degree and were likely read by a select audience. Arithmetic textbooks, even those that discussed the weights of coins, never described when or how a consumer or merchant should use a money scale, yet people seemed to


\(^{335}\) Hebert, 124.
know when it was appropriate—when they felt uneasy about the coinage presented to
them during a transaction.

An account-book entry from November 1, 1791, by Abiel Abbott, a cooper
from Andover, Massachusetts, illustrates how individuals used money scales to
identify counterfeit and lightweight coins. On November 1, 1791, Abbott received
“one piece of gold called Dollar waied [sic] 5/5½” and “one piece of gold called
£1:1-0 waied [sic] 14/6½.”[336] [See Figure 36] In particular, these coins were a
Spanish-American gold half-escudo and a British gold guinea. The former was equal
to eight Spanish-American reales, or one dollar. When he recorded the amount lost,
Abbott did not list the exact weight of the underweight coin, but rather its value based
on its weight. A full-weight dollar—whether made of gold or silver—held six shillings
(6s.) in value, while this particular piece contained five shillings, five-and-a-half pence
(5s.5½d.). The made the coin six-and-a-half pence (6½d.) undervalue, or 10.8%
underweight. Similarly, a guinea coin was to equal one pound, one shilling (£1.1s.) in
value, while the piece Abbott received contained only 14 shillings, six-and-a-half
pence (14s.6½d.) in value—six shillings, five-and-a-half pence (6s.5½d.) less than
when it began to circulate. As one grain of gold equaled two pence, a loss of six
shillings, five-and-a-half pence equaled 38.75 grains underweight, or a loss of more
than 30% of its full weight. Traditional wear would not have caused this significant
amount of loss, so Abbott likely received a clipped coin.

Regardless of how the coins became lightweight, this cryptic account book
entry showed that Abbott used a pair of money scales to find that he had accepted

336 Abbott, 59.
lightweight coins. After he weighed the coins, Abbott added the supposed value of the coins and the actual intrinsic values of the two pieces together. He calculated the former correctly: one pound, one shilling (£1.1s.) plus six shillings (6s.) equals one pound, seven shilling (£1.7s.). However, when he calculated the latter, he found that five shillings, five-and-a-half pence (5s.5½d.) plus 14 shillings, six-and-a-half pence (14s.6½d.) equals 19 shillings (19s.), when it actually equals 20 shillings (20s.).337 This error gained an extra shilling for Abbott.

Using a set of money scales was inconvenient. In 1830, New York Congressman Nathan Sanford argued that “coins which must be weighed to ascertain their value, are very inconvenient money.”338 Physically weighing a coin was a precarious and time-consuming task. Money scales compared the difference between the unknown mass of a coin and the known mass of a money weight relative to the overall load of the money scale. Most scales sold in the United States came with sets of pennyweights and grain weights. The scale user needed to know the correct amount of a full-weight specimen of the foreign coin under consideration. More often than not, a chart on the lid of the box that held the money scale listed common foreign coins in circulation for this purpose. A circa-1755 scale imported from Britain by Thomas Johnson of Boston, for example, included a chart with the number of pennyweights and grains for 14 different coins: English gold guineas, half guineas, and silver

337 Ibid.

crowns; Portuguese gold moidores and two-, one-, half-, and quarter-Johannes coins; Spanish-American gold four-, two-, and one-pistole coins and silver whole, half-, and quarter-dollar coins.339 [See Figure 37].

With such information, the scale user found the correct combination of pennyweights and grain weights to equal that amount. One pennyweight equaled 24 grains, and weight sets often included pieces that weighed up to 17 pennyweights (408 grains) or higher. While his or her fingers suspended the instrument with the pans still resting on a flat surface, a consumer or merchant would then place the coin on one pan of the scale followed by the money weights on the other. As the individual raised the scale higher, the pans elevated from the table and the beam swayed for some time before the indicator came to a rest. The ultimate goal was to allow the scale to hang freely, with as little movement as possible, thus allowing gravity to act as the primary influence on its components. If the coin was of proper weight, the indicator settled perfectly straight up-and-down. However, if the coin weighed less than the money weight, the indicator leaned toward the heavier object, and the beam no longer rested at equilibrium.

To find the difference in mass between the money weight and the coin, the scale user would have placed a grain weight on the pan holding the coin. [See Figure 38]. These were generally small, flat, square pieces of brass that weighed from one grain to six grains, and were marked much like the face of a game die. If the underweight coin plus the single grain weight were still light, he or she replaced the grain weight with a two-grain weight, and so on until the indicator sat perfectly

339 Newman and Mallis, I-4-6. The chart listed the eight-, four-, two-, and one-escudo coins as four-, two-, one-, and half-pistole coins, the French-language equivalents.
upright. For coins of extremely light weight, the individual used grain weights in combination, such as a six- and a two-grain weight to equal eight grains. During this process, he or she might purposely, but barely, upset the beam once or twice to help the fulcrum settle. Once at rest, the user could then calculate the number of grains underweight into a monetary value, and subtract that sum from the value of a full-weight coin. Each grain of gold lost through circulation reduced the value of a coin by two pence (2d.), or three cents and seven mills ($0.037). For silver coins, each pennyweight (24 grains) equaled 3 pence (3d.), or five-and-a-half cents ($0.055)—making each grain of a silver coin worth a half-farthing (1/8d.), or just over two mills ($0.002).340

An assay was a more accurate, yet complicated method of ascribing the value of a coin using a pair of scales. The first step in an assay was to ascertain the fineness, or quality, of a foreign coin. An 1853 article published in The Philadelphia Dispatch described this procedure as “a solemn trial of the virtues of the metal.”341 Assays of foreign gold coins, as performed by the Philadelphia Mint, began with weighing a sample of the coin with “the most delicate scales, and the tiniest weights, in the world” to the ten-thousandths of a grain.342 Whatever the weight of the gold, the assayer added twice as much pure silver to the sample. A thin piece of lead, seven-times the weight of the gold, acted as a cornet-shaped envelope for the gold and silver sample,

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340 A mil is one-tenth of one-cent; one one-thousandth of a dollar; or $0.001.


342 Ibid.
known as a bullet. The assayer placed a bullet into a cupee, a small, round white vessel made of phosphate of lime (finely ground burnt bone), then into a clay oven known as a muffle. One muffle held a number of cupel (plural of cupee). This assemblage then spent 20 minutes in a burning charcoal furnace, until it glowed bright red. The lead that made the outer envelope of the bullet melted, followed by the silver and gold, as well as any other impurities in the sample (such as lead, tin, copper, or iron). The phosphate-of-lime cupel absorbed the lead and the impurities, all of which rapidly oxidized, fumed, and left the chamber.

At that point, nothing remained except pure gold and silver. Once cooled, the assayer hammered the mixture until flat, annealed it (quickly heated and slowly cooled), hammered it again, and rolled it into a tight spiral. To separate the gold and silver, the assayer then submerged the mixture into a glass flask that contained pure nitric acid. The acid slowly came to a boil, emitted orange-colored fumes, and—after 10 to 15 minutes—left behind a residue of silver nitrate. After repeating the nitric acid wash, nothing remained in the flask except pure gold. Once washed and annealed again, the assayer was certain that the gold was completely unadulterated. The remaining gold then faced the same scales as in the beginning of the process. The difference in mass from the first weighing exposed the total mass of all impurities that existed in the original sample, and the assayer could calculate the fineness of the coin based on the results. If a three-grain piece of gold weighed 2.7 grains after the assay process, then the assayer could say that the foreign coin was 90% pure gold. This complex process inspired the author of the 1853 article to recognize an assayer as “a dainty manipulator” of precious metals.343

343 Ibid., 15.
While, technically, anyone could perform an assay on foreign coinage, the United States Congress officially tasked the Philadelphia Mint with an annual assay of a variety of foreign coins that circulated throughout the country. According to the Coinage Act of April 2, 1792, a silver dollar contained $371\frac{4}{16}$ grains of pure silver, while a gold eagle ($10$ gold piece) contained $247\frac{3}{8}$ grains of pure gold—or $24.75$ grains per dollar. With this information, assayers could define the pure gold or silver content of a foreign coin and give it a value in United States dollars. On January 31, 1793, Congress stipulated that the assayers were to fulfil their duties on the second Monday of February every year. The initial assays included the gold coins from Great Britain, Portugal, France, Spain, and all Spanish dominions, as well as silver Spanish dollars and French crowns. They found the fineness of British and Portuguese gold coins equal to each other, but different to those of France, Spain, and Spanish-America. As a result, gold coins from the former two locations totaled one dollar for every 27 grains of coin (or $88\frac{8}{9}$ cents per pennyweight), while the latter was one dollar for every $27\frac{2}{5}$ grains of coin ($84$ cents per pennyweight).

With each successive assay by the Philadelphia Mint, this information changed, albeit on an irregular basis. For example, the assay of 1813 found that the


gold coinage of Great Britain and Portugal had not changed since the initial assay of 1793. [See Figure 39]. However, the gold coinage of France—“especially those issued since the year 1806”—were no longer equal to their Spanish counterparts. From that time, their value rested at one dollar for every \(27^{351}/691\) grains of pure gold (87\(\frac{3}{4}\) cents per pennyweight). Spanish gold coinage—“somewhat variable in their quality”—averaged one dollar for every \(28^{739}/1331\) grains of pure gold (84\(\frac{3}{100}\) cents per pennyweight).

347 William E. DuBois, Assistant Assayer (1836–72) and Assayer of the Mint (1872–81), justified this practice when he stated, “It is the fact that foreign Mints are constantly proving our coins, just as we are constantly trying theirs. If we do not find them up to the mark, we make no secret of it.”

348 Whatever the outcome, the assayers provided the results of the assays to the Mint Director, who then published the results in their annual Mint Reports.

The Distrust of Money Scales and Weights

From their handmade production to their handheld use, money scales and weights were small, fragile devices, with which much could go wrong. Did consumers and merchants have anything to worry about? In short, yes. Their concerns reveal a multitude of problems that ranged from the quality of the beam to the proper storage of the weights; from the honesty of those who used the scales to the quality of their own eyesight. The overall capacity of a money scale depended on its sensitivity.


accuracy, and precision, as well as the accuracy of the money weights. Sensitivity told whether or not a money scale could react to minute variations in weight, accuracy relayed whether or not a money scale correctly stated the difference in weight of the coin, while precision told whether or not a money scale could repeat the same measurement over and over again. Just like the coins under consideration, the money weights themselves were subject to wear, counterfeiting, and alterations. Ultimately, these variables dictated the results read from a money scale and made people think twice about the value of the coinage they held.

What allowed a money scale to work well? In 1837, Scottish physician Andrew Ure had this in mind when he theorized that, “The greater the length of the arms, the less distant the centre of gravity is beneath the centre of suspension, the better polished its central knife-edge of 30°, the lighter the whole balance, and the less it is loaded, the greater will be its sensibility.” This was only partially true. While all of these factors certainly affected the sensitivity of a money scale, they did not do so to an equal degree. As previously noted, 18th- and 19th-century money scales compared the relative difference between the unknown mass of a coin and the known mass of a money weight. The sensitivity of a money scale was its ability to detect small discrepancies in weight, or how much the indicator responded to a particular difference in mass. A sensitive money scale was important in determining the correct value of coin, and one of the foremost concerns for those who used it. If, for example, a merchant put a one-grain weight on the pan and the beam did not move, the money

scale being tested was not very sensitive. Numismatists T. Sheppard and J.F. Musham suggested that some money scales were sensitive enough to register the loss of a farthing worth of gold—the equivalent of one-eighth of a grain. The use of grain weights as the smallest measure of adjustment, however, made that difference in mass difficult to perceive. In practice, this minute difference was often less than a degree in turn of the indicator, and the scale user found it impossible to determine whether the shift in the beam was from the increased weight or from the constant tremors of his or her fingers as he tried to keep the money scale suspended as steadily as possible. To observe such a loss, the merchant took note of the rested positions of the indicator both before and after he placed the grain weight on the pan, and understood one-eighth of that distance to represent one farthing worth of gold.

Historically, sensitivity had many names: sensibility, the turn of the scale, the cost of the beam, the tolérance en plus, the tret, and the clough (also spelled cloff). In 1819, lexicographer John Mason Good defined clough as “an allowance…that the commodity may hold out [in] weight when sold by retail.”

To placate their


customers, merchants sometimes subtracted this theoretical amount of weight from the final sum of a bill in order to compensate for the minute amount of mass lost in a vain attempt to get the indicator of a balance scale to budge. They generally only deducted a charge for the clough when they weighed heavy items or goods sold in bulk, but the concept existed in all ranges of mass. In 1852, mathematician John Radford Young stated that clough was a “trifling allowance,” though, in reality, the deduction for the clough grew considerably depending on who calculated the amount.\textsuperscript{352} The clough ranged from two pounds in every three hundred (0.67%), two pounds in every hundred (2%), to four pounds in every one-hundred-and-four (3.85%).\textsuperscript{353} When converted into a monetary value, the latter two clough percentages were considerably high—about five pence and ten pence of a gold guinea, respectively. The first amount, however, was closer to an acceptable sensitivity of weight when valued in gold: about one-and-three-quarters-of-a-penny, or seven farthings. Nevertheless, at seven times the estimate by Sheppard and Musham, not even the lowest clough rates were sensitive enough for the purposes of gold and silver. In 1836, the British Parliament found that

\textsuperscript{352} J.R. Young, \textit{Rudimentary Treatise on Arithmetic, with Full Explanations of Its Theoretical Principles, and Numerous Examples for Practice} (London: John Weale, 1852), 96.

clough was “a very vague term, because a scale will turn at ¼ lb. or ½ lb., or it may be 1 lb. or 7 lbs., and therefore there can be no rule for the turn of the scale.”

Human error made the prospect of finding the definitive weight of a coin nearly impossible. Unsteady hands were a constant nuisance and a source of fatigue. In 1756, Charles Sommers, author of *A Treatise on the Method of Weighing Gold and Silver*, observed “that to hold them as is usual in the Hand, is not sufficiently steady,” and “found a material Difference between the Weight of a small Piece, when the Scales have been held in the right Hand, and when in the left; which is owing...to the Hand not being so steady.” Similarly, geologist Thomas Oldham observed that “the mode of weighing coins by hand requires much dexterity, practice, and attention; but in spite of all these, errors were inevitable.” Some operators learned to use their unsteady hand to their benefit and compensated the minute swing of the pans for the smallest degree of indicator movement. Most people, however, attempted to minimize human interference, which proved futile. In 1845, William Cotton, Governor of the Bank of England, expressed frustration with the silk strings of a scale, which were

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354 *Selection of Reports and Papers of the House of Commons, Volume 13* (1836), 325.


always “very much in the way, and frequently, by striking them, a rotatory motion is given to the scale exceedingly incompatible with perfect accuracy.”

The trustworthiness of the human eye was another challenge. While Gerard Houben defined sensitivity as “the smallest visually detectable inclination of the beam,” the ability to see slight changes certainly differed from person to person. Contemporaries estimated an overly-sensitive money scale, or one that would not stop teetering, “to be poised, when the excursions of the needle on both sides of the zero of the scale are equal”—but this measurement required keen eyesight. Differences in human perception added an additional element of uncertainty to the overall functionality of money scales. In 1852, for example, Professor W.H. Miller expressed concern for the “difference in the judgment of the weighers, [and] failing of the eyesight.” Bank of England Governor William Cotton struggled with the relative positioning of the indicator, which was “always put above the beam, so that at each action the eye has to quit the scale, and be raised to the top,” which he considered “very fatiguing.” Cotton complained that “no advantage at all seems to be gained by it; but the evil attending it is, that the eye is wearied, and the exact position of the


360 Putnam & Co., 27.

361 Sharp, 842.

362 Ibid., 843.
scale is frequently missed in placing the coin upon it, thus causing vibration, and the equipoise is lost.” Thomas Oldham went so far as to claim that “the injury sustained by the optic nerve, from constantly watching the indicator of the scales, was a serious inconvenience to the operative.”

Sensitivity was not the only factor in the overall uncertainty of relying on money scales. The accuracy of a money scale was its ability to display the same reading on both sides of the beam. If, for example, a merchant placed a guinea on one pan and a money weight on the other pan, and the indicator rested a certain number of degrees from center, would the scale have responded with the same number of degrees in the opposite direction if the merchant reversed the coin and money weight? If not, the money scale was not very accurate. Benjamin Gorham, in 1834, noted that “the burden of proof was, it was true, cast entirely upon the debtor, who wished to pay his debt in foreign coin.” The threat of a false balance, however, must have caused many creditors to recheck the foreign coinage that he or she received from a debtor.

An inaccurate money scale indicated an unbalanced beam, or a false balance. In 1848, engineer Luke Hebert noted that “the great difficulty of attaining an exact equality in the length of the arms of a balance, renders it almost hopeless to attempt to obtain the exact weight of any mass of matter by this means.” Like sensitivity, the

363 Ibid.

364 Oldham, 174.


366 Hebert, 124.
influence that accuracy played on a money scale increased as the load of the scale increased. The threat of a false balance further compounded when factored in with the intent to defraud. A dishonest scalemaker could construct a money scale that rested at equilibrium without weights on its pans, but also maintain equilibrium with two unequal weights added. This was possible by forming a beam that contained brachia (arms) of unequal length, but of equal weight. In addition, the pans of the money scale must weigh a proportion equal to (but inverse from) the difference of the unequal brachia—so the lighter pan was paired with the longer brachium, and vice versa. For example, if the left brachium of a false balance measured 70 millimeters and the right brachium measured 80 millimeters, then the left pan needed to weigh 80 grains and the right pan to weigh 70 grains (or any other weight combination equal to that 7:8 ratio) in order for the indicator to rest at equilibrium without anything on its pans. However, in order to maintain equilibrium while in use, objects of unequal weight needed to rest in the pans. In this case, the object in the lighter pan needed a mass 7:8 (or 12.5%) lighter in proportion than the object in the heavier pan. To conceal its deceitful nature, the differences were usually small enough to not attract notice, but large enough to turn a profit over time.367

A dishonest person could use a false balance in two different ways. First, if a consumer purchased an item with a gold coin, and the merchant put the coin on the side of the false balance with the shorter brachium, the consumer would believe his or

367 Jean-Étienne Montucla, Recreations in Mathematics and Natural Philosophy: Amusing Dissertations and Enquiries Concerning a Variety of Subjects the Most Remarkable and Proper to Excite Curiosity and Attention to the Whole Range of the Mathematical and Philosophical Sciences (London: G. Kearsley, 1803), 4–5.
her coin to be worth less than the actual intrinsic value. The merchant, who refused to take the coin for any more than the value indicated by the false balance, made a profit. On the other hand, if the consumer who made the payment also owned the false beam, that person would put the coin on the side with the longer brachium. For example, a consumer could have easily placed a guinea that weighed only 113 grains on the lighter pan, and a money weight that weighed 129 grains on the heavier pan. If the brachia measured 60 and 52.5 millimeters each, the balance would have found equilibrium. This cheated the merchant out of 2 shilling, 8 pence (2s.8d.) per guinea (21s.)—an enormous amount compared to the few farthings that he or she fretted over when concerned with the sensitivity of a money scale.

Naturally, contemporaries considered false beams a form of fraud, and took precautions when they suspected their presence. Late-18th century French mathematician Jean-Étienne Montucla reminded contemporaries, “In purchasing valuable articles, if they are not well acquainted with the vender, it is necessary to examine the balance, and to subject it to trial.” One method was to remove the pans from the beam, and the difference in weight showed itself in the beam that no longer held equilibrium. If disassembling the money scale was not an option, a skeptical individual could test the accuracy of a money scale with two trial measurements. The test was simple: weigh a coin and a money weight (or any two objects with similar mass), then reverse the coin and money weight in the pans and test again. An indicator that came to rest at equilibrium (or at the same number of degrees off equilibrium) in both trials indicated that the money scale had maintained a balanced beam. If,

368 Montucla, 4.
however, the indicator settled at different points during the two phases of the test, the money scale likely contained a beam with unequal brachia. “Tho’ such a Balance may be so nicely made as to deceive the Eye,” as early-18th century philosopher John Theophilus Desaguliers indicated, “the Cheat is immediately discover’d by changing the Weights, and the Commodity…from one Scale to another.”

One method of weighing completely circumvented any concerns for the accuracy of a money scale. Known as double weighing, this method introduced a third object to the pans of the money scale. In addition to the coin and the money weight, doubling weighing called for the use of shot or sand in order to accurately weigh a coin. With the coin in the left pan, this method required the addition of shot to the right pan, in the precise amount needed to form perfect equilibrium. The next step was to carefully replace the coin with money weights—but leave the shot in place—until the indicator reached perfect equilibrium once again. The known mass of the money weights, therefore, was equal to the unknown mass of the coin, regardless of the beam length of the money scale. In order for this method to be useful, however, the money scale needed a high degree of sensitivity, for the smallest amount of shot or sand to register a difference on the indicator. A dishonest person could only get around this through sleight of hand, by quickly replacing the weights with another set that would allow the beam to show similar results for both tests. French mathematician Jean-Charles de Borda received credit for the discovery of this method in the second half of the 18th century. However, the simplicity of this method, compared to the

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370 Hebert, 124.
millennia-long history of balance scales, suggests that Borda re-discovered this method. Dr. Bruno Kisch states that an “awareness of the importance of exact weighing” had been lost in previous centuries and did not begin to exist in most branches of commerce until the end of the 18th century.\textsuperscript{371}

Other methods for receiving the correct value of a coin from a false balance existed. If shot or sand were not available, Montucla found that the \textit{mean proportional}, or \textit{geometric mean} \((\prod t_i = \sqrt{t_1 \times t_2})\) of the two masses that allowed a false beam to rest at equilibrium revealed the true weight of the coin. For example, if the money scale found a guinea to weigh 135.25 grains with the coin in the left pan and the money weight in the right pan, and 122.50 grains with the coin and money weight in the opposite pans, the true weight of the coin was 128.72 grains \((\sqrt{135.25gr \times 122.50gr})\). If this level of math was out of reach for an individual, Montucla conceded that the \textit{average} of the two test measurements—in this case, 128.88 grains—was “the true weight very nearly,” or good enough for ordinary transactions.\textsuperscript{372} Like double weighing, the use of mean proportional to find the correct value of a gold coin also circumvented the woes of a false balance.

Beyond sensitivity and accuracy, a third factor also played a role in overall uncertainty. The precision of a money scale lay in its ability to duplicate the same measurement over and over again—its repeatability. If a merchant weighed the guinea with the money scale, rested the pans back onto the table, and lifted the contraption

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\textsuperscript{372} Montucla, 5.
once again—or even slightly upset the beam with a light tap—an honest scale-indicator would rest at the same position. Unlike accuracy, the length of the beam did not affect the precision of a money scale. The material composition of the beam, however, could disrupt its repeatability. Magnetism, for example, could easily influence the precision of a money scale constructed with a steel beam. Variations in temperature, others argued, caused brass beams to expand and contract enough to cause discrepancies in outcomes.\textsuperscript{373} While the majority of money scales retained steel beams (78.2\% of the 23 examined in the American Numismatic Society collection), scalemakers certainly employed both metals. So long as these conditions remained inert, the fulcrum of the scale acted as the primary influence on its overall precision.

Historically, people recognized the importance of precision to the overall functionality of a money scale, but often conflated the term with its “accuracy” or “sensitivity.” In \textit{Putnam’s Home Cyclopaedia}, for instance, the entry for “Balance” stated that “the properties required in a good balance are sensibility,” already examined herein, “and stability…It must be stable, that is to say, when the equilibrium has been disturbed it should quickly return, and oscillate about the position of rest.”\textsuperscript{374} While \textit{Putnam’s} does not use the term precision to refer to its repeatability, its use of stability refers to the same desired outcome. Eventually, the entry does state that “absolute precision is unattainable in practice,” but follows this with an explanation of the “simple method, imagined by Borda” (i.e. double weighing) to test the relative

\textsuperscript{373} Abraham Rees, \textit{The Cyclopædia: Or, Universal Dictionary of Arts, Sciences, and Literature} (London: Longman, Hurst, Rees, Orme & Brown, 1819), WATCH.

\textsuperscript{374} Putnam & Co., 26.
length of the brachia. The author used the term “precision” when he actually referred to accuracy.375 In 1833, literary editor William Wilberforce Mann boasted about his money scale, which he claimed could reveal a difference of 0.5 milligrams (0.008 grains) in weight, and that he was “obliged to repeat that experiment several times, in presence of incredulous persons, and always the same result.”376 While his money scale was supposedly capable of repeating such a minute difference, it was not that which impressed him; the minute degree of sensitivity was the feat that he showed off to naysayers.

Money weights had inaccuracies all their own. A money weight represented a specific mass, but, nearly invariably, their actual mass was off by some small degree and weights rarely equaled one another. Money weights for an English guinea, for example, should have weighed 129.44 grains, but rarely equaled that exact amount. Unlike money scales, whose fulcrum played a major role in their uncertainty, money weights did not have individual components to compromise their integrity. They contained nothing more than a particular mass unless altered in one way or another. Many variables could have affected the mass of a money weight during its lifetime.

375 Ibid., 27.

Like all copper-based objects, money weights deteriorated over time—either chemically, or physically from repeated use. Deterioration and wear from use—despite taking years or even decades—proved just as detrimental to the functionality of a money weight as the short-term actions of a deceitful individual. One fraudulent method was to soak a brass or bronze money weight in a simple salt solution. Physically, this caused the weight to slightly reduce in mass with minimal alterations in appearance. The dishonest individual could then use that money weight to cause others to think that his or her lightweight and counterfeit coinage contained more intrinsic value than it actually did. Laws had forbidden such acts since at least Byzantine times.\(^{377}\)

We have seen that an individual could put a set of money scales through a series of experiments to determine whether or not they were worthy and true. This was not the case with money weights. Unfortunately, the only option was to compare their mass with the known mass of another weight. While this method might have quickly exposed one that was grossly underweight, it could not provide a definitive answer to the inaccuracy of a money weight. As Bruno Kisch suggests, knowing the true weight of a coin was not possible until after the 1896 publication of *The Gases of the Atmosphere*, by Sir William Ramsay, which led to the understanding of atomic mass.\(^{378}\) Prior to that, the “known weight” of one object was merely a relative measurement to the “known weight” of another object, which was relative to the “known weight” of the object before that, and so on. In his 1848 report to Congress,

\(^{377}\) Kisch, 8, 81.

\(^{378}\) Ibid., 8.
Alexander D. Bache, of the United States Office of Weights and Measures cited this phenomenon as he explained the difficulties encountered in reproducing the standard set of weights and measures for multiple jurisdictions:

> With the utmost precaution, a certain range of error is to be found in the original standards, and this goes on increasing as copies are made from copies. If the originals were not as accurate as they could be made, the copies of copies would be entirely wanting in uniformity. Our measures in common use show that this result is but too frequent.\(^{379}\)

A certain degree of inaccuracy in money weights inevitably occurred from the moment of production. Not even the most sensitive, accurate, and precise money scale could have worked properly with faulty money weights. Bache urged that “original standards must, of course, be made with extreme care, and all the resources of science and art of the day must be employed in their construction and adjustment.”\(^{380}\)

However, he acknowledged that “minor precautions may be omitted, and cheaper materials used” for the copies of the copies of the originals—those actually used to compare the weights of consumers and merchants.\(^{381}\) Bache recognized that weightmakers often produced official sets of weights and measures with haste and thrift at the expense of accuracy. City officials then used these potentially underweight

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\(^{380}\) Ibid.

\(^{381}\) Ibid.
copies to verify the mass of all other money weights within that town or parish. As London-based bullion smelter and refiner Barwell Browne noted in 1840, “Whatever mathematical nicety may be necessary in the first formation of a weight or measure, that is soon lost in practice.”  

Other inaccuracies arose during the production process. Once a weightmaker cast a money weight to as close as the intended mass as possible, he or she adjusted the weight more finely, but this was not an exact science. If a freshly cast money weight was heavy, the weightmaker simply used a file to remove the excess mass. For one that proved too light, however, it was common to drill a hole into the underside of the brass and add lead or pewter. [See Figure 40]. The higher density of these other metals increased the mass while they occupied the same amount of space. Ordinances in many regions deemed it illegal to produce weights solely from lead or pewter, though often stipulated that the law was “not to prevent the insertion of such a plug of lead or pewter into weights as shall be bona fide necessary to adjust and stamp them.”

Although widely accepted as a remedy, F.R. Hassler, the first director of the Bureau of Weights and Measures for the United States Treasury Department, warned against this “old, bad habit” because it caused “by the galvanic action between the metals, an oxidation, that changes the weights, by the process of time, more than their

382 “Extracts Relating to the Expediency of Preserving One of the Former Measures and One of the Former Weights Unaltered; with Notes on the Error that May in Practice be Tolerated,” in G.B. Airy, editor, Extracts of Papers Printed and Manuscript, Laid Before the Commission Appointed to Consider the Steps to be Taken for Restoration of the Standards of Weight and Measure, and the Subjects Connected Therewith (London: W. Clowes & Sons, 1840), 301.

383 Hugh Barclay, A Digest of the Law of Scotland, with Special Reference to the Office and Duties of a Justice of the Peace (Edinburgh: T. & T. Clark, 1855), 972.
wear in use would do. Therefore,” Hassler concluded, “weights, to be accurate, must be made of one mass and metal, and ultimately rubbed down to the full adjustment.”\(^{384}\) He suggested that platinum would “evidently be the best metal now known for this purpose [due to its] buoyancy in the atmosphere.” The high cost of platinum, however, made that impractical. Several money weights in the collection of the American Numismatic Society show evidence of a lead or pewter plug, such as two of the seven money weights included with a money scale produced by Johann Peter Braselmann of Wichlinghausen (within the Pfalz Region of present-day Germany) in 1774; and the Louis d’or money weight included with the money scale produced in 1805 by Johann Friedrich Mayer of Nuremberg.\(^{385}\) Through the early 19th century, money weights increasingly became die-struck and, therefore, no longer received such treatment—though they continued to vary in mass.

To ward off fraud, or to retire overly worn money weights, officials often inspected and stamped properly adjusted money weights prior to their distribution, as well as periodically thereafter. In his account books, for instance, New York City merchant John Jacob Moore noted that he purchased a set of weights in November of 1828. Thereafter, he paid city officials for “Inspecting Weights and Measures” on at least two occasions—to Peter F. Cisco on June 27, 1831, and to William Frost on

\(^{384}\) Ferdinand Rudolph Hassler, *Comparison of Weights and Measures of Length and Capacity, Reported to the Senate of the United States by the Treasury Department in 1832* (Washington: Duff Green, 1832), 98.

\(^{385}\) Weight Scale of J.P. Braselmann, Germany, American Numismatic Society, 0000.999.50123. Weight Scale of Johann Friedrich Mayer, Germany, American Numismatic Society, 0000.999.50132.
March 17, 1835. In doing so, Cisco and Frost merely compared Moore’s weights against their own on a balance scale. In most jurisdictions, laws required such actions. In Wilmington, Delaware, for instance, “An Ordinance for the Better Regulation of the Markets” of 1822 maintained that “all weights and measures used therein shall be duly stamped by the regulator of weights and measures of the borough.” If caught using or selling false or unstamped weights, or falsely balanced money scales, the accused paid a four-dollar fine—literally thousands of times more costly than the handful of cents in gold that a person hoped to obtain with a counterfeit money weight. Officials often confiscated unstamped weights and, if they could locate specific transactions that took place with such weights, they considered them null and void. The money weights in the collection of the American Numismatic Society contain a wide range of inspection marks—including London, Birmingham, Amsterdam, Paris, Cologne, Dublin, various jurisdictions throughout the United States, and several other locations.


387 “An Ordinance for the Better Regulation of the Markets of the Borough of Wilmington,” American Watchman and Delaware Advertiser (Wilmington), December 10, 1822, 3.

388 Throughout the North Rhine region of Germany—where craftsmen produced money scales, weights, and boxes as a set, rather than merely assembled to form a product for wholesale distribution, as in London—properly-adjusted money scales and
What did inspectors look for? Given that officials used the same types of money weights and scales to inspect those that merchants and consumers used in daily commerce—with all of their impediments and uncertainties—how did officials decide that one money weight was more fit for use than another, or that their own weights were correct? Many laws that regarded weights and measures did not stipulate how the inspector was to make this judgement. In New York State, for example, the Act in Relation to Weights and Measures, passed in June of 1836, gave the Superintendent of Weights and Measures the authority to “take charge of the standards,” delegate sets of weights to various jurisdictions, and review them to his own sets of measures at least every ten years.\(^{389}\) City inspectors ensured that “the weights, measures and all apparatus used for determining the quantity of commodities used throughout the town…agree with those standards in his possession.”\(^{390}\) However, the act gave no indication as to how the Superintendent or the city inspectors were to know if a weight was officially deficient in mass. Official inspectors likely used “the smallest visually detectable inclination of the beam” to determine whether the money weight of another individual was lightweight or not.\(^{391}\)

weights received a brand mark on the inside of the wooden box from officials in Cologne: JUSTIRT or IUSTIRT, meaning “adjusted.”


\(^{390}\) Ibid.

\(^{391}\) Houben, 51.
In lieu of a lack of instruction to inspectors, the legal allowances for coins could serve as an appropriate substitute to determine the expectations of a money weight. Coinage could circulate within a narrow range of weight before deemed too light to retain its full value. Since they meant to emulate these coins, money weights should have also measured within the same allowances in order to remain effective. Legislation termed the legal allowance in weight as the *remedy in weight*, or the *remedy of the mint*. The Coinage Act of 1816 (56 Geo. III c.68) defined the remedy in weight as 12 grains per standard pound of gold, or 0.17% \( \frac{12}{7000} \approx 0.17\% \).\(^{392}\) Since the legal full weight of a guinea coined after 1772 was 44½ guineas per standard pound of gold (129.44 grains), the remedy-of-weight equated to 0.22 grains per guinea. In France, the allowance for 20 franc gold coins (also known as *Napoléons*) was \( \frac{2}{1000} \) of the weight (0.20%).\(^{393}\) At 99.56 grains—or 155 pieces per kilogram of gold—this equated to a legal variation 0.199 grains-per-coin (99.56 grains \( \times \) 0.20\% = 0.199 grains).\(^{394}\) These allowances were not recognized internationally, but they show the expectations that certain realms held for their coinage.

Once a coin circulated outside its realm of origin, it faced the laws and customs of a different monetary system. Once in the United States, for example, an English guinea no longer faced English law. Since gold and silver coins circulated by weight, rather than by face, United States law did not stipulate an allowance in weight of coins

\(^{392}\) Kelly (1821), 217–218.

\(^{393}\) Ibid., 142.

in the same manner that most European states did. However, the assayers at the United States Mint in Philadelphia did have one that they abided by, and they rejected coins that weighed more than \( \frac{1}{144} \) parts (or 0.69%) below their legal weight.\(^{395}\) Therefore, during the annual assays, the Mint discarded English guineas more than 0.90 grains, and French 20-franc coins more than 0.69 grains from their original legal weights—three times the weight loss that European allowances stipulated. These relatively low standards show that individuals and officials in the United States were more tolerant of lightweight coins than their peers in Great Britain, France, and perhaps elsewhere.

It was difficult for individuals during this period to definitively determine the true weight of coins in their possession. Given the gross inaccuracies of money weights, every weight affected each scale differently. This made it impossible to accurately discern the correct value of a coin using the only available tools. One one-guinea money weight altered the capacity of a scale to a specific degree, while a different one-guinea weight altered the same scale to a different degree. If the operator of the money scale was under the impression that his or her one-guinea money weight contained a mass of 129.44 grains, but actually weighed only 127.97 grains (1.47 grains light, an inaccuracy of 1.14%)—as in the case of one English guinea weight from the reign of William III in the American Numismatic Society collection—how could a coin be properly weighed?\(^{396}\) How was it possible to tell whether a gold guinea was five pence undervalue (\(5d.\), or 2.5 grains), when the money weight itself was already nearly 1.5 grains light?


\(^{396}\) Money Weight, British, Guinea, American Numismatic Society, 1954.234.22.
The inherent uncertainties associated with relying on any money scale—the problems with sensitivity, accuracy, and precision—along with the inaccuracy of money weights were enough to blur the true mass of the coins. Each combination of money scale, weight, and coin was unique. They secretly robbed one individual-per-transaction of a relatively sizable amount of money—sometimes calculable in pence. Even when a truthful individual determined the value of a coin based on a money scale, it was likely wrong. That is not to say that money scales were completely worthless as tools. To best evade the uncertainties of these tools, prominent British scientist Charles F. Partington felt that an individual only needed a highly sensitive scale; one that “would make so great a difference in the turn of the scale, that it would be seen immediately” and provided a yes or no answer as to the credibility of a coin, rather than a definitive value.\textsuperscript{397} Despite the uncertainties described above, American consumers and merchants continued to use money scales to check the supposed weight of suspicious foreign coins through the first half of the 19\textsuperscript{th} century. In 1817, for example, just prior to his self-imposed exile to the United States, journalist and future member of Parliament William Cobbett paid no heed to the uncertainties of money scales. He stated, “If you had a bad opinion of the man who tendered the guinea, you would examine very carefully to ascertain whether it was gold; you would weigh it to

\textsuperscript{397} Charles F. Partington, editor, \textit{The British Cyclopaedia of the Arts, Sciences, History, Geography, Literature, Natural History, and Biography Copiously Illustrated by Engravings on Wood and Steel by Eminent Artists, Volume I} (London: Wm. S. Orr and Co., 1838), 184.
see whether it was weight: but, if you found it of pure quality and of full quantity, you
never would be so foolish as to refuse to put it into your pocket.”

**Counterfeit Detectors**

Some began to develop other methods of checking their suspicious coins. Throughout the period when foreign coinage legally circulated in the United States, the Patent Office only issued three patents for new types of pocket-sized money scales—two in 1853, and one in 1857. While counterfeit detectors did not answer to the exact value of a coin, they provided a yes/no answer as to whether a person should accept a particular coin or not. Whether these were in direct response to the negative qualities of traditional money scales is difficult to deduce. As the use of both money scales and foreign coinage diminished after the late 1850s, the practice of testing foreign coins with counterfeit detectors such as these was limited. The scales no longer relayed an absolute value, and were likely as insensitive, inaccurate, and imprecise as traditional money scales—if not more so.

On April 12, 1853, Jacob J. Hatcher of Spring Garden, Pennsylvania received a patent for an instrument to check suspicious coinage—what he called a “Coin Safe and Detector.” [See Figure 41]. This was a cylindrical device with two chambers: one to weigh and gauge coins, and the other to store them. On one end of the piece, a cap screwed off to allow a “sliding weighing or gaging apparatus” to emerge. The very

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399 Charles G. Page, J.J. Greenough, and Chas. L. Fleischmann, editors, “No. 9661. J.J. Hatcher, Spring Garden Pa.—Improved Coin Safe and Detector. Patented April
top of the telescopic scale bore “a slot of just sufficient size to test the thickness,” or to
gauge a coin.\textsuperscript{400} If it was too thick, the holder of the coin could quickly deem it a
counterfeit. If it fit, it matched the correct thickness of a genuine coin, but one should
still examine its weight to determine authenticity, as a counterfeit coin of the correct
thickness could weigh less than a genuine coin. When a coin rested in the gauge, it
was also on the pan of the scale as the gauge and the pan were one and the same. The
telescopic cylinders of the scale incorporated an internal “delicate spring,” as well as a
cut-away portion of the wider cylinder. The fine spring allowed the weight of the coin
to contract the thinner cylinder into the wider, while the cut-away portion of the latter
allowed the operator to view how far the thinner cylinder contracted into the wider.
The operator then compared the amount that the spring-loaded cylinder contracted
with a suspicious coin to that of a coin he or she knew as genuine. Therefore, unlike
traditional money scales, the scale did not necessarily relay to the operator how much
a coin actually weighed. The second chamber of the contraption was the “coin safe,”
which contained a spring-loaded pad that allowed for multiple coins to be installed.
When the operator shifted a lever mounted to the top of this chamber, a coin ejected
from the device and the spring forced the next coin in position to eject.

Less than three months after Hatcher received his patent, on July 12, 1853
Henry G. Robinson of Schuylkill Haven, Pennsylvania also received a patent for an
implement of the same name. [See Figure 42]. Also named the “Coin Safe and

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\textsuperscript{12th}, 1853,” The American Polytechnic Journal; A New Monthly Periodical, Devoted
to Science, Mechanic Arts, and Agriculture (Washington: 1853), 406.
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9,661 dated April 12, 1853,” United States Patent Office.
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Detector,” this was a cylindrical device with two chambers: a long side which held a scale, and a shorter section that acted as a gauge box. Robinson suggested that users of his scale employ the gauge box first. This section of the detector allowed the user to pass the coin through a recess that matched the thickness of a genuine coin. If the coin proved too thick when passed through, the holder could immediately deem it a counterfeit and discard the coin. However, as Robinson stated, “If the coin will pass snugly through the recess…into the box, it must of course be of the same dimensions as a genuine coin. If counterfeit,” he warned, “it will be lighter,” and should then be weighed.401 To weigh the coin in question, the scales unscrewed from inside the longer end of the contraption, unfolded, and inserted into “fulcrum holes” located on the sides of the chamber. This allowed the device to act as a traditional balance scale. According to Robinson, “the coin to be tested should be moistened with spittle [i.e. saliva], to cause it to adhere to the end of the box…as a change of position of the coin would cause great inaccuracy in weight.”402 The entire gadget was then lifted with the conjoined chambers hanging below. If genuine, the combined chambers rested at equilibrium; if counterfeit, the end with the coin raised into the air. The gauge box “may be sufficiently large or deep to contain several pieces of coin” and banknotes


402 Ibid.
could wrap around the rod of the scale, which made the contraption “as portable as the ordinary wallet or pocketbook”—hence its added designation as a “coin safe.”

On January 13, 1857—less than six weeks before the end of foreign coinage circulation in the United States—Harvey Maranville, of Clinton, Ohio received a patent for the third form of money scale during this period. [See Figure 43]. He called it a “balance for detecting counterfeit coins,” and received patent number 16,390A. The scale consisted of a disk and a slide that rested on either side. A triangular piece soldered to the disk acted as the fulcrum and fed through a pair of hinged feet. The operator of this scale would have placed a suspicious coin on the disk and situated the slide to correspond with the name of the coin labeled on the slide, which pulled out for heavier coins and in for those of a lighter weight. The scale was at equilibrium if the weight of the coin was correct, or would fall to either side if too heavy or too light—much like a seesaw. Additionally, two gradated metal flanges held the coin onto the disk and measured its thickness, while markings on the disk itself measured its diameter. Maranville designed the scale to weigh all United States silver and gold coins, British silver shillings and gold sovereigns, French silver two- and five-franc coins, and gold 20-franc coins. The editors of Scientific American perceived that this


scale was “intended to be kept on the shelf or counter of each business man, as a ready means of detecting any fault in the weight or size of either silver or gold coin.”

While generations of American consumers and merchants spoke critically of traditional money scales, the three types of replacement scales that Hatcher, Robinson, and Maranville invented in the 1850s did not necessarily alleviate their concerns. The scale by Hatcher depended on a “delicate spring” as the primary component to carry the weight of each coin placed upon it. Springs, however, have a propensity to deteriorate over time and lose their resistance. In 1852, G.F. Hall and Cornelius Varley observed this deterioration, and found that bluing—the application of heat until blue in color—was “essential to the stiffness of a spring; and as, by oxidation or any other cause, the blue wears off, the elasticity of the spring becomes gradually less.”

Around the same time, clockmaker Edward John Dent performed experiments that corroborated the findings of Hall and Varley. The delicate spring would eventually wear down and the scale would become useless. The scale invented by Robinson faced further drawbacks. Not only did it rely on the same qualities and incapacities of a traditional money scale, but his recommendations to use saliva as an adhesive further suggested the inept quality of the contraption overall.

The counterfeit detector invented by Maranville had similar problems. Although the editors of Scientific American felt that the contraption was “a delicate and very nicely adjustable scale for weighing each coin,” the scale had several


faults.\textsuperscript{408} One of the primary faults of functionality was the slide. Since the scale operated much like a miniature seesaw, a genuine coin levelled the balance. Any minute difference in the distance that the operator pulled the slide out from one use to the next could result in consequential differences in each assessment. Surviving examples also show that the feet and the slide were easy to lose, and that the triangular piece soldered to the disk was prone to break off.\textsuperscript{409} Furthermore, like traditional money scales, its brass composition left it susceptible to distortion with variations in temperature. Lastly, this scale, as well as those by Hatcher and Robinson, did not help consumers and merchants in the valuation of unrecognizable foreign coinage, as each device only weighed a specific coin or group of coins.

\section*{Conclusion}

In the United States through the 18\textsuperscript{th} and 19\textsuperscript{th} centuries, the circulation of foreign coinage facilitated the spread of counterfeit coins, as well as overtly damaged and lightweight coins. The instruments used to value them, however, proved insufficient. The circulation of these coins impaired the confidence that people held towards metallic money—and higher percentages of counterfeits led to greater amounts of distrust. In particular, the range in quality of coins from the various European and North and South American mints made it increasingly difficult to

\textsuperscript{408} “Maranville’s Money Scale,” 393.

\textsuperscript{409} While these scales appeared just prior to the passage of the Coinage Act of 1857, they were the only of the three money scales invented in the 1850s that reached a sizable scale of production—by C.E. Staples of Worcester, Massachusetts. As a result, it is possible to study surviving scales to note their weaknesses, albeit with limited examples (about 30 known).
discern what was genuine and what was counterfeit. In addition to the general identification and rejection of counterfeit coins of the many different types of foreign coins that circulated in the United States, consumers and merchants also needed to recognize the several different methods of counterfeiting. Not only did “counterfeit” coins include outright fakes, but counterfeiters employed a variety of methods to extract value from genuine coins before passing them off as untouched.

Since the earliest period of monetary circulation in the Americas, money scales attempted to provide a sense of assurance regarding the value of suspicious, lightweight, and unrecognizable foreign coinage. Due to the acute physics required to accurately weigh gold and silver coins, money scales could not operate to the degree of nicety that American consumers and merchants had hoped. They spoke critically of the sensitivity, accuracy, and precision of money scales, as well as the accuracy of money weights. These quantitative inefficiencies cast doubt onto the instruments, and most consumers and merchants only used them for coins that would have cost them gross amounts of money had they accepted them at face value. Unfortunately, money scales constituted the only method available to discern the value of these coins. Just before foreign coinage ceased to circulate in the United States, however, Americans conceived other forms of weighing devices, known as *counterfeit detectors*. The design and construction of these devices demonstrated even further weaknesses and did not act as acceptable replacements for traditional money scales. Ultimately, throughout the entire period, the use of money scales proved limited due to the perpetual problems of inconvenience, inefficiency, and distrust. By the 1930s, when the United States ceased the production of gold coinage, consumers and merchants had ended the use of any type of money scale or detector.
Figure 29  Thomas Shields gave Joseph Whitle "a Discount made in his part of Loss in Counterfeit Doubloon as a grain." Thomas Shields, Day Book, The Joseph Downs Collection of Manuscripts and Printed Ephemera at the Winterthur Museum, Garden & Library, Folio 27, 8.

Figure 30  A platinum-filled 1759 four-escudo coin After an individual removed the internal metal from the coin, he or she filled it with platinum (at the time, less expensive than gold—though still not cheap), and rejoined the two halves with its new core. American Numismatic Society, 1955.91.2.
Figure 31  A sweated 1711, Great Britain gold 2 guinea-coin. This coin originally had much more detail, but artificially worn down through the chemical process of aqua regia. Heritage Auctions, 2018 February 22 Weekly World and Ancient Coin Auction #231808, lot 64159.

Figure 32  A clipped 1622, silver 4 real, from Toledo. This coin began as relatively round but was clipped (at least) four times by a deceitful individual. American Numismatic Society, 1927.17.1.
Figure 33 Loose pocketbooks allowed for coins to hit one another, as well as other objects, which led to wear over time. Embroidered Pocketbook of Jane Eakin of New Castle, Delaware, 1766. Winterthur, 1993.0045
Figure 34  Coin banks allowed for coins to hit one another, as well as other objects, which led to wear over time. During its time in a coin bank, the coin was most certainly not circulating, but likely received some of its harshest treatment whenever someone handled the bank. Painted Stoneware Coin Bank, ca. 1820–1840, Baltimore, Maryland. Winterthur, 1959.1786.
Figure 37  English Money Scales Imported by Thomas Johnson of Boston, Massachusetts, ca. 1750. See the 14 different coins, their weights, and values listed on the maple box likely produced in the British-American colonies. Also, note the 17- and 8½-pennyweights used to weigh Spanish-American dollar and half-dollar coins. American Numismatic Society, 2010.4.5.

Figure 38  One-, three-, four-, five-, and six-grain weights. Individuals used these small pieces of brass to adjust their money scale to find how many grains light (or heavy) their coin was.
FOREIGN COINS.

The Annual Report of the Director of the Mint, on the subject of the assays of foreign coins, contains a statement of assays of the gold and silver coins of Great Britain, France, Spain, and Portugal, from which it appears—

1. That the gold coins of G. Britain and Portugal are all uniformly of the same quality, and exactly equal to that of the gold coins of the U. States; and therefore their intrinsic value is at the rate of 100 cents for 27.46 grains, or 68.3 cents per pennyweight.

2. That the gold coins of France, especially those issued since the year 1806 inclusive, are also of a uniform quality; their intrinsic value being at the rate of 100 cents for 27.46 grains, or 87.36 cents per dwt.

3. That the gold coins of Spain are somewhat variable in their quality; their average intrinsic value being at the rate of 100 cents for 27.46 grains, or 84.25 cents per dwt.

4. That the intrinsic value of the French Crown, supposing its weight 18 dwt. 17 grs. is 110 cents and 76.4 parts of a cent.

5. That the intrinsic value of the Spanish Dollar, exclusive of those issued prior to the year 1806, supposing it of the full weight of 17 dwt. 7 grs. is 100 cents and 75.88 parts of a cent.

Figure 40  Difference between money weight with lead added to it to adjust for weight (left) and filed down to adjust for weight (right). American Numismatic Society, 0000.999.49862.
Figure 41  “Coin Safe and Detector,” by Jacob J. Hatcher of Spring Garden, PA. Patented on April 12, 1853, number 9,661. Jacob J. Hatcher, “Coin Safe and Detector,” United States Patent Office.
Figure 43  “Balance for Detecting Counterfeit Coins,” by Harvey Maranville of Clinton, OH. Patented January 13, 1857, number 16,390A. “Maranville’s Money Scale,” Scientific American 12, 50 (August 22, 1857): 393.
The unit, or dollar, is a known coin, and the most familiar of all to the minds of the people. It is already adopted from south to north; has identified our currency, and therefore happily offers itself as an unit already introduced. Our public debt, our requisitions and their apportionments, have given it actual and long possession of the place of unit. The course of our commerce too will bring us more of this than of any other foreign coin, and therefore renders it more worthy of attention. I know of no unit which can be proposed in competition with the dollar but the pound; but what is the pound? 2410

Despite the conditions that American consumers and merchants had to navigate in order to conduct day-to-day commerce with foreign coinage—learning fairly complicated arithmetic; weighing lightweight and counterfeit coins with unsatisfactory scales and weights; and dealing with the various state shilling-pence systems—this was the familiar and proven method of commerce in the United States. The foreign coinage that already circulated in the United States upon its foundation was long familiar to the newly christened citizens. Most Americans could easily identify British, French, Portuguese, and—as Thomas Jefferson highlighted above in 1785—Spanish-American coins. By the 1840s, however, new sources of foreign coinage led to

2410 United States Continental Congress, 10.
unfamiliar coins in circulation, and the customary system began to fall apart. Immigrants poured into New York City from regions of Europe previously unseen in the United States and brought all of their possessions and valuables with them—including their money. Without an accessible mint, the coins entered circulation, but proved incompatible with the blend of United States, Spanish-American, British, French, and Portuguese coins that Americans understood.

This chapter argues that the circulation of foreign coinage in the United States—and coinage, in general—depended on the familiarity of the physical coins to both the consumer and the merchant. Although the United States monetary system used absurd and obscure methods in the late 18th and early 19th centuries compared to the present day, it was familiar to those who used it every day. Even the designers of the United States monetary system understood that the day-to-day commerce of the country depended on a familiarity with foreign coinage and created the United States dollar to accommodate its use, rather than force its removal. While early-19th century debate surrounded the legal-tender status of shillings, fips, levies, and half-joes, it was only when additional types of foreign coinage entered the system in the 1840s that most individuals agreed to their complete removal from circulation. A growing percentage of coins within the United States monetary system proved unable to circulate when consumers and merchants did not recognize and could not assign value to them. The new coins were not compatible with the known methods of reckoning. Attitudes towards foreign coins eventually shifted from that of dependency and familiarity to one of burden and gridlock. Criticism began to reflect particular nativist sentiments of the era.
Accommodating the Familiarity of Foreign Coinage with the United States Dollar

The creation of the United States monetary system, a process that took from 1781 until 1792, involved two competing proposals for a national currency. In 1782, Robert Morris proposed an advanced duodecimal monetary system and, in 1785, Thomas Jefferson proposed the decimal system that the United States continues to use. Traditionally, historians discuss the Morris and Jefferson plans in tandem: Morris created his plan, then Jefferson expanded upon it.\footnote{Hepburn, (1903), 14–15. Nussbaum, 46–47. Wilson, 71–72. Redish, 210–212. Goodwin, 82–89.} Foreign coinage acted as the thread that held various aspects of these systems together. Both relied heavily on the prior experiences of Americans with foreign coins, as well as on the continued circulation of such pieces. At the time, without a domestic mint, all of the coins in circulation came from foreign locations. Most people understood that the sudden expulsion of these coins from circulation would have caused economic mayhem—commerce interrupted, business networks broken, and fortunes unusable until recoined. More important, this was the only system understood by most, and sudden changes to it would cause confusion amongst the populace.

In late 1781, as the Superintendent of Finance under the Articles of Confederation, Robert Morris received orders from the Continental Congress to prepare an exchange-rate chart of the different types of foreign coins that commonly circulated within the United States at the time.\footnote{“Editorial Note: Jefferson’s Notes on Coinage,” Founders Online, National Archives, version of January 18, 2019. From Julian P. Boyd, The Papers of Thomas Jefferson, vol. 7, 2 March 1784–25 February 1785 (Princeton: Princeton University Press, 1953) 150–160.} This would allow the government to

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redeem the Continental Currency it had issued to fund the Revolution, in exchange for “Spanish dollars or the equivalent in gold or silver coin,” as promised to the bearers of the inflated paper currency.\textsuperscript{413} [See Figure 18]. In addition to successfully handling the finances of the American Revolution, Morris had extensive experience with foreign coinage as an international merchant, much more so than the average American. His shipping firm Willing, Morris, and Company (partnered with Thomas Willing) had business with all of the major European powers as well as in the West Indies, the Levant, and India. The firm even co-financed the first American ship to China in 1784. His knowledge of both domestic finances and international commerce situated Morris as the most experienced and adept individual for the task. Beyond the valuation of foreign coinage, Morris saw this as an opportunity to promote “a plan for an American coin,” which he developed with his business associate Gouverneur Morris (no relation).\textsuperscript{414} On January 15, 1782, Robert Morris submitted a proposal in the form of a letter to John Hanson, president of the Continental Congress.\textsuperscript{415} His

\textsuperscript{413} The exchange-rate chart also served as a reference for treasury officials to receive the correct tax payments. Redish, 211. Hepburn, (1903), 14. Wilson, 71.

\textsuperscript{414} Jason Goodwin illustrates the relationship between Robert and Gouverneur Morris well: “The two men were not related, but it was said that Robert Morris had taken advantage of the coincidence, relying on Gouverneur Morris’s wooden leg: he installed Gouverneur Morris in a big downstairs office, where anyone who came to the lobby asking for Morris was shown in to see him. The visitor would address him confusedly as Gouverneur, and they would wind up talking about the wooden leg until they had run out of time. Meanwhile Robert Morris worked on undisturbed in a small room upstairs.” Goodwin, 83.

proposal included recommendations for Congress to establish a physical Mint. It is clear that Morris prioritized the creation of a monetary system over the repayment of Continental Currency, as it was not until December of 1782—a full year after the initial request—that he finally presented Congress with an exchange-rate chart for foreign coinage.416

Morris designed his monetary system around the various shilling-pence systems already prevalent throughout the different states alongside the circulation of Spanish-American silver coins in the United States. The familiarity of those coins among Americans, as well as their global recognition, pushed Morris to the conclusion that “there is hardly any which can be considered as a general Standard, unless it be Spanish dollars.”417 In his decision to embrace the state systems, Morris proclaimed, “In order that a Coin may be perfectly intelligible to the whole People, it [must] have some Affinity to the former Currency.”418 To unify these various state currencies, Morris needed to find a method to make each of the state shillings compatible, not only with each other but also with the new unit of money he had created. The easiest method was to find the lowest common denominator of eight York, seven-and-a-half New England, six Pennsylvania, and five Georgia shillings-per-dollar.419 This equaled

416 Hepburn, (1903), 14–15.
417 Morris, letter to John Hanson, 35–36.
418 Ibid.
419 A York shilling was the same as a North Carolina shilling; the Pennsylvania shilling was the same as the Virginia shilling; the South Carolina, not represented above and as explained later, was still undergoing rapid inflation.
1,440 units, which Morris called “the lowest divisible Point of Money.” At first, he named these units doits. But, after the realization that one doit was nearly exactly equivalent to a quarter-grain of pure silver, by the time of his proposal to Congress he had renamed them quarters, so that 1,440 quarters equaled one Spanish-American dollar (1,440 qrs. = one dollar). Furthermore, 1,600 quarters equaled one silver crown coin (1,600 qrs. = one crown), which included British and French crowns, German thalers, and Dutch rijksdaalders, among other large silver coins in circulation that contained about 414 to 415 grains of silver.

Morris adopted the Spanish-American dollar as a base, but not as a unit of account. While the Spanish-American dollar equaled 1,440 quarters under this plan, Morris introduced the United States pound, valued at 1,000 quarters—equivalent to four shilling, two pence (4s.2d.) Pennsylvania currency, or $ of a Spanish-American dollar. Additionally, the United States pound also included a shilling of 100 quarters, and penny of 10 quarters. Much like the various state shilling-pence systems already in use, the United States pound did not represent a physical coin by that name. While Morris decimalized the new American pound as a unit of account, he felt “no Necessity that this Money Unit be exactly represented in Coin,” which remained very

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420 Morris, letter to John Hanson.

421 Robert Morris, letter to John Hanson. Goodwin mistakenly quotes this as 1,400, instead of 1,440. Goodwin, 84.

422 Wilson, 71. Later, at the recommendation of Jefferson that the one-quarter coin would prove “too small for a Unite,” Morris tripled the value of United States pound to equal 12 shilling, six pence (12s.6d.) Pennsylvania currency, or $ Spanish-American dollars. Sylvester Sage Crosby, The Early Coins of America; and the Laws Governing their Issue (Boston: Estes & Lauriat, 1878), 309. Robert Morris, letter to John Hanson.
much duodecimal.\textsuperscript{423} They consisted of a gold \textit{crown} (worth 1,200 qrs.) and \textit{half crown} (600 qrs.); a silver \textit{dollar} (worth 300 qrs.), \textit{shilling} (100 qrs.), and \textit{groat} (20 qrs.); as well as a copper \textit{quarter}.\textsuperscript{424}

Morris eventually decimalized his plan. “Altho,” Morris initially felt, “it is not absolutely necessary...that Money should be increased in a decimal Ratio,” he ultimately conceded that it was “very desirable.”\textsuperscript{425} When compared with fractions, he rationalized, decimals rendered more accurate outcomes when consumers and merchants calculated exchange rates, interest, and insurance. He redesigned the physical coins linked to the United States pound to also reflect the decimal system. The new coinage was comprised of five denominations: the silver \textit{mark} (1,000 quarters), the \textit{quint} (500 quarters), and the \textit{cent} (100 quarters), as well as copper coins of five and eight quarters each, which Morris respectively called the \textit{five} and the \textit{eight}.\textsuperscript{426} Morris felt that these two coins alone would unify the various state shilling-pence systems. He explained that “two of the former will make a Penny Proclamation or Pennsylvania Money; and three a Penny Georgia Money; of the latter three will make a Penny York Money; and four a Penny lawful [or] Virginia Money.”\textsuperscript{427} Due to the dependence on non-decimal coins—the five and the eight—Jason Goodwin calls

\textsuperscript{423} Robert Morris, letter to John Hanson.

\textsuperscript{424} Crosby, 309–310.

\textsuperscript{425} Robert Morris, letter to John Hanson.

\textsuperscript{426} Robert Morris, letter to John Hanson. Wilson, 71. Hepburn, 14.

\textsuperscript{427} Robert Morris, letter to John Hanson. United States Continental Congress, 6.
the new pieces proposed by Morris did not include gold coinage, as he felt that a paper currency could accommodate larger transactions, at the proposed rate of 14½ to one.429

Morris hoped his monetary system would unify each of the state currencies and allow them to easily exchange between each other using the new coins, as well as foreign coinage. This involved “a very simple process, by which the imaginary money of the several states may be translated into such pieces, or vice versa.”430 It required an individual to divide 1,440 by the number of shillings-per-dollar in a given state, and find the answer in the number of quarters-per-shilling. For example, 1,440 quarters divided by eight York shillings-per-dollar equaled 180 quarters-per-York shilling. This equation could find the number of quarters-per-shilling for any state. Thus, the Pennsylvania shilling equaled 192 quarters, and the New England shilling equaled 240 quarters. Thomas Wilson theorizes that “Morris sought to rationalize the various values in shillings assigned to the Spanish dollar by the states.”431 However, this proposal effectively called for the institutionalization of the shilling-pence system and the monetary chaos that followed well into the second-half of the 19th century. By giving various components of his proposed system names already in use under the state shilling-pence systems—albeit with different values attached to them—Morris added another layer of perplexity to how consumers and merchants already valued

428 Goodwin, 84.
429 Wilson, 71. Hepburn, (1903), 14. Redish, 211.
430 United States Continental Congress, 1.
431 Wilson, 71.
their currency. The confusing state of the shilling-pence system would have continued indefinitely, while this monetary system would have only “unified” them through homonymic names, additional arithmetic, and the accommodated circulation of foreign coinage.

Although unoptimistic about its subsequent acceptance by the public, on February 21, 1782 the Continental Congress approved the Morris plan. Through the first half of 1783, Morris slowly worked toward the creation of a national mint. Congressional account books from this period refer to it as “the Public Mint,” “the American Mint,” and “the Mint of North America.” Between February 8 and May 5, Morris used public funds to create a set of pattern, or experimental coins related to his proposal. Benjamin Dudley—along with Jacob Eckfeldt, A. Dubois, and John Swanwick—aided Morris in the preparation of the mint and the coins. On April 2, 1783, Dudley delivered a one-mark silver coin to Morris, what he deemed “a piece of Silver Coin, being the first that has been struck as an American coin.” On the 22nd, Morris and Dudley presented Congress with a set of coins—a copper five-quarter piece, and silver 100-, 500-, and 1,000-quarter coins (cent, quint, and mark, respectively). [See Figure 44]. One side of each coin portrayed a large eye surrounded by many rays and thirteen stars, along with the motto CONSTELLATIO NOVA. The other side showed a circular wreath surrounded by the inscriptions LIBERTAS and JUSTITIA and the date, and with “U.S.” and the denomination (…5; .100; .500; or 1.000) inside the wreath.


433 Crosby, 310.
The experiment was ill-fated. Morris and Dudley produced only one to three pieces of each denomination noted above, and none of the eight-quarter coin. In total, this handful of coins cost $252\(\frac{2}{3}\) to strike. Although they attempted to procure a minting press as late as July 7, 1783, Morris understood that the Continental Congress was close to dissolving. The Pennsylvania Mutiny on June 21 forced Congress to vacate Philadelphia, and the pending Treaty of Paris (drafted November 30, 1782; signed September 3, 1783) threatened the existence of the institution, itself a wartime measure. Morale was low throughout the region. In mid-August, Morris “sent for Mr. Benjamin Dudley, and informed him of my doubts about the establishment of a Mint and desired him to think of some employment in private sector.”\textsuperscript{434} On the 30\(^{th}\) of that month, Dudley returned the dies to Morris, certain that their enterprise would soon end. In 1784, Morris retired as the Superintendent of Finance, and nothing more came of this venture.

As the Morris plan failed, Thomas Jefferson began to formulate an alternative. From March to May of 1784, he wrote his now famous “Notes on Coinage,” which not only analyzed and deconstructed the Morris plan, but also introduced his own. Much like the former, the Jefferson plan relied upon on the knowledge and experience that American consumers and merchants had with foreign coinage, as well as the continued circulation of those pieces. Unlike Morris, Jefferson did not hold official positions related to the finances of the nation. However, he philosophized at length on national usages of numerics, weights and measures, and decimalization, and even suggested that a United States monetary system be “expressed by decimal notation in Dollars and

\textsuperscript{434} Ibid., 310.
parts of a dollar” as early as 1776. While not known as a merchant, Jefferson had many experiences with foreign coinage as a consumer and was adept in monetary affairs. In 1769, for example, Jefferson gave three Portuguese half-joes, two German gold coins, and a silver coffee pot to friend Matthew Maury to purchase books for him while in London. His interests in coinage sometimes even went beyond their commercial aspects. In 1786, while in France, he purchased some “Moorish coins” as curiosities from David Salisbury Franks, recently returned from North Africa, for 60 French livres (about 10 dollars).

Jefferson was disingenuous when he stated that “the plan reported by the financier is worthy of his sound judgment,” as in fact he noted many problems. One of his primary complaints was that where Morris saw that his system “may be perfectly intelligible to the whole People,” Jefferson felt that it “introduces a coin unlike in value to anything now in use [and] departs from the national mode of keeping accounts.” The complexities of the shilling-pence systems created “a question not easily determined” for a new monetary system, and he proclaimed that “our object is to get rid of those currencies,” rather than adopt them as Morris planned. He worried that future inflation of the individual state shillings would


436 “Memorandum Books, 1769,” *National Archives: Founders Online*.

437 “Coin Collection,” *Monticello*. Online.

438 United States Continental Congress, 10.


upset the national system.\textsuperscript{441} In fact, the Morris plan glaringly omitted the inflation-plagued South Carolina shilling, at the time valued at an astronomical 32½ shillings per dollar.\textsuperscript{442} Had Morris included the South Carolina shilling, the least common denominator would have resulted in 18,720 instead of 1,440 units-per-dollar. Furthermore, Morris had divided the Spanish-American dollar so that it would prove “too minute for a Unite” and result in an exorbitant range of pricing.\textsuperscript{443} Even mid-range purchases, Jefferson noted, such as “a horse or bullock of 80 dollars will require a notation of six figures, to wit, 115,200 Units.”\textsuperscript{444}

Foreign coinage played a substantial role in the formation of the Jefferson plan. His primary concerns were convenience, ease, and familiarity. His “Notes on Coinage” listed three requirements that every monetary system should contain:

1. That it be of convenient size, to be applied as a measure to the common money transaction of life. 2. That its parts and multiples be in an easy proportion to each other, so as to facilitate the money arithmetic. 3. That the unit and its parts or divisions be so nearly of the value of some of the known coins, as that they may be of easy adoption by the people. The Spanish dollar seems to fulfil all these conditions.\textsuperscript{445}

\textsuperscript{441} United States Continental Congress, 10.

\textsuperscript{442} Robert Morris, letter to John Hanson.

\textsuperscript{443} Crosby, 309.


\textsuperscript{445} United States Continental Congress, 9.
Instead of using the Spanish-American dollar to create a new coin of relative value, Jefferson understood that it was already “a known coin, and the most familiar of all to the minds of the people…and therefore happily offers itself as a unit already introduced.”\textsuperscript{446} Critical of Morris’ new dollar—which was about one-fifth the weight of a Spanish-American dollar—Jefferson noted that “It is difficult to familiarize a new coin to the people. It is more difficult to familiarize them to a new coin with an old name.”\textsuperscript{447} Furthermore, the creation of the crown, half crown, shilling, groat, and quarter under the Morris plan would have compounded this confusion, as each of those coins had English or Spanish equivalents, albeit of different values.

His division of the United States dollar, however, differed vastly from its Spanish-American counterpart. Instead of fractional divisions, Jefferson opted to decimalize the dollar. By decimalizing the divisions of the dollar, Jefferson eased all aspects of calculating money. The amount of arithmetic needed to convert the various state, national, and foreign currencies then in circulation helped motivate his decision. He asked his colleagues to recall school days:

Everyone 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; adding the shillings, taking out the twentieths and carrying them on; but when he came to the pounds, where he had only tens to carry forward, it was easy and free from error.\textsuperscript{448}

\textsuperscript{446} Ibid, 10.
\textsuperscript{447} Ibid.
\textsuperscript{448} Ibid., 9.
He also understood that decimal currency would ease daily commerce, and noted that:

Those who have had occasion to convert the livres, sols, and deniers of the French, the gilders, stivers and pennings of the Dutch, the pounds, shillings, pence and farthings of these several states, into each other, can judge how much they would have been aided, had their several subdivisions been in a decimal ratio.\footnote{Ibid.}

To simplify the United States monetary system, Jefferson initially suggested only four coins. In addition to a one-dollar coin ($1.00) that would parallel the Spanish-American equivalent, he proposed a gold ten-dollar coin ($10.00), a silver one-tenth dollar ($0.10), and a copper one one-hundredth-of-a-dollar coin ($0.01). Later, he added a one-fifth-of-a-dollar coin ($0.20). He compared the ten-dollar gold coin to the Portuguese half-joe and the British half guinea, the ten-cent coin to the Spanish-American real which “will differ from it but by a very small fraction,” and the hundredth-coin to the New York penny at $1/96^{th}$-of-a-dollar and the Pennsylvania penny at $1/90^{th}$-of-a-dollar.\footnote{Ibid., 10.}

The newly decimalized monetary system completely superseded the use of reduction—the arithmetical practice of expanding a monetary system in order to accurately convert it to another. Simply moving the separatrix (either a comma or, as used today, a decimal point) between the written dollars from cents was sufficient enough. In 1789, Maryland planter Judge John Beale Bordley found that “the division of monies of account and coin into tenths is wonderfully convenient…How easy to
multiply or divide 16,849 cents by dots!”

He contended that “the new terms and divisions into tens will presently become familiar, and are the most excellent for ready and correct reckoning, to the learned as well as the unlearned.”

In his discussion on the ease and use of federal money, Rev. Daniel Parker noted that reducing this currency “is readily accomplished without using at length, either Multiplication or Division…It is necessary only to bear in mind, that dollars are made cents by annexing two ciphers, which is equivalent to multiplying the dollars by 100.”

Unlike the mix of foreign coinage, decimalized coinage easily functioned with only mental calculations. Robert Garson notes that early propagandists for a decimalized dollar argued that it “would ease commercial transactions, make the parties to those transactions more confident, and reinforce a republican society through its informed citizenry.”

The ease of decimalization also carried over into the physical act of payment in coin. Under the old system, Jefferson noted that a consumer or merchant needed to use a series of calculations to find the correct combination of coins to equal the sum of a bill of eight pounds, 13 shilling, 11½ pence (£8.13s.11½d.). To pay the same bill


452 Bordley, 1–4.

453 Daniel Parker, *The Improved Arithmetic: Newly Arranged and Clearly Illustrated, both Theoretically and Practically, to Meet the Exigencies of the Student in the Acquisition of the Nature and Science of Numbers; and also, to Aid the Accountant in All Arithmetical Computations, Relative to Business Transactions* (New York: J. & J. Harper, 1823), 83.

454 Garson, 39.
under the proposed system, an individual needed 38.65 decimalized dollars—which he notated as “38.65D.” He or she “will know by inspection only that 3 golden pieces, 8 units or dollars, 6 tenths and 5 coppers, pay it precisely.”\textsuperscript{455} Furthermore, Jefferson recommended that an assay take place and “a table should be formed” to list the foreign coinage in circulation and the worth of a pennyweight and grain of each foreign coin (in order to value a coin based on weight and metallic content), and suggested that foreign coins become legal tender “if not clipped or otherwise diminished.”\textsuperscript{456} The Mint would restrike all other coins for a nominal fee.

The Continental Congress responded positively to the Jefferson plan. In 1785, a Congressional Grand Committee of one member from each state raised the issue anew. According to Thomas Wilson, they reopened the Morris plan as a point of comparison, but “reported negatively” on it rather quickly.\textsuperscript{457} While they kept the basic structure of the Jefferson plan intact, the committee added a five-dollar gold piece ($5.00), replaced the one fifth-dollar coin with a quarter-dollar ($0.25), and added a one two-hundredth-of-a-dollar coin. ($0.005). In July 1785, Congress officially passed the amended Jefferson plan and established that the “money unit of the United States of America be one dollar.”\textsuperscript{458} Jefferson learned of its passage through a newspaper article, and enthusiastically admitted to James Monroe that he “ought to have inserted a gold coin of 5 dollars, which being within 2 shillings of the

\textsuperscript{455} United States Continental Congress, 10.

\textsuperscript{456} Ibid., 12.

\textsuperscript{457} Wilson, 71–72.

\textsuperscript{458} Nussbaum, 47.
value of a guinea will be very convenient."

On August 8, 1786, Congress named the ten-dollar gold coin an eagle, the silver-tenth coin a disme (later dime), and the copper-hundredth coin a cent. It also introduced the mill, one-one-thousandth-of-a-dollar, or a tenth of a cent ($0.001), though this only appeared in accounts and was never physically represented by a coin. On October 16, 1786, Congress passed an ordinance to establish a mint as well as a copper coinage struck under a private account. These one-cent pieces, known as Fugio cents and designed after suggestions by Benjamin Franklin, had legal tender status at up to five percent of a payment [See Figure 45]. James Jarvis received the only contract under this resolution, though he struck a fraction of the stipulated 345 tons of copper cents (or 32,149,468 pieces at $44\frac{4}{9}$ coins-per-pound). After September 1, 1787, foreign copper coins lost all legal recognition in the United States.

Less than three weeks later, the ratification of the Constitution disrupted this momentum. The newly formed federal government understood the utility of the Jefferson plan—including the continuing need for foreign coinage—and adopted it as a part of its constitutional power “to coin Money, regulate the Value thereof, and of

459 “Editorial Note: Jefferson’s Notes on Coinage,” 150–160.


461 Redish, 212.


463 Hepburn, (1903), 14–15.
foreign Coin” as stipulated in article one, section eight. On April 2, 1792, Congress passed An Act Establishing a Mint, and Regulating the Coins of the United States. Commonly known as the Coinage Act of 1792, this established “a mint for the purpose of a national coinage,” defined the officers and personnel needed to operate the institution, and detailed the specifications of 10 new coins: gold eagle ($10.00), half eagle ($5.00), and quarter eagle ($2.50); silver dollar ($1.00), half dollar ($0.50), quarter dollar ($0.25), disme ($0.10), and half disme ($0.05); and copper cent ($0.01) and half cent ($0.005). [See Figure 46]. Like the Jefferson plan, this used the Spanish-American dollar as a foundation yet committed to decimal notation for the ease of monetary calculations.

On February 9, 1793, Congress passed An Act Regulating Foreign Coins. This act established that, beginning on July 1, “foreign gold and silver coins shall pass current as money within the United States, and be a legal tender for the payment of all debts and demands.” The act specifically listed the gold coins of Great Britain, Portugal, France, and Spain and its dominions, as well as silver Spanish milled dollars, its fractional parts, and the crowns of France. Furthermore, foreign coinage issued after January 1, 1792 was not a legal tender until mint officials assayed a specimen, set its value, and proclaimed a legal tender by the President of the United States. This was


466 United States Congress, An Act Regulating Foreign Coins, 300–301.
the basic framework of the United States monetary system until 1857—a series of bimetallic coins based on a decimalized dollar, and a variety of foreign coinage that held legal tender status based on weight. The Spanish-American dollar was a base and decimal arithmetic was a method to easily maneuver between transactions.

Sentiments toward the Foreign Coinage that Circulated in the United States, 1790s–1840s

With the United States monetary system in place, Congress defined what American consumers and merchants could legally use in payment to each other. Nearly every aspect of the system revolved around the familiarity that American consumers and merchants had with foreign coinage. However, sentiments towards this system varied greatly—from individuals who objected to the continued circulation of foreign coinage to those who wanted to abolish the United States Mint and rely solely on foreign coinage. The law itself lay somewhere in the middle. In the early 1790s, while Congress understood the immediate need for the circulation of foreign coinage, it did not intend all forms to circulate forever. The Act Regulating Foreign Coins (1793) stated that “at the expiration of three years…all foreign gold coins, and all foreign silver coins, except Spanish milled dollars and parts of such dollars, shall cease to be a legal tender.” Furthermore, once the Mint began operation, they would initiate the recoining of all foreign gold and silver coinage received in payment, with the exception of Spanish-American silver. By 1797, Congress expected the Mint to have produced enough coinage to no longer necessitate the wide variety of foreign coinage in circulation. The plan was to use the domestic coinage and Spanish-

467 United States Congress, An Act Regulating Foreign Coins, 301.
American dollars to simplify the system without impacting the monetary supply of the nation negatively. This, however, did not occur as planned. For the next 60 years, newspapers, periodicals, and government documents offered a running commentary on the limits, failures, and occasional successes of the system.

While Americans generally saw striking a national coinage as an integral component of national sovereignty, they also understood that foreign coinage had to circulate for the sake of commerce. Many, however, expected the Mint to recoin quickly. In 1797, John Nicholas, lawyer, farmer, and politician from Williamsburg, Virginia stated that, “if it were ever possible to fill the country with our own coin, it would now have been filled.”468 He explained that, “at least in the interior of the country,” coins struck at the United States Mint did not circulate and he “never did see an eagle pass in any current commercial transaction.”469 In 1805, Speaker of the House Nathaniel Macon exposed inadequacies of the Mint when he stated, “With regard to our own coin, in many parts of the union it was as difficult to find a flying as a gold Eagle.”470 That same year, another writer noted that “It had been found that the mint could not furnish a sufficient supply of coin for our purposes.”471 In 1834, Senator Thomas Hart Benton explaining the dearth of American coinage in the United States, stated that there was “not a particle of gold, nor a single whole dollar to be


469 Ibid.

470 “Thursday, December 19,” 2.

471 Ibid.
found; very few half dollars, except in the neighborhood of the mint,” and went so far as to call the twenty \( \text{sic} \), ten, and five-cent pieces “a curiosity, in the interior parts of the country,” such as his home state of Missouri.\(^{472}\) That he called the 25-cent piece a 20-cent coin is telling of how often Americans had contact with the domestic coinage of the United States.

More than any other reason, Benton felt that foreign coinage should continue to circulate due to a strict interpretation of the Constitution. Benton understood that “it was the intention and declared meaning of the constitution that foreign coins should pass currently as money.”\(^{473}\) He noted “the duty of Congress to promote the circulation of these coins” and felt that “all the laws of Congress for preventing the circulation of foreign coins, and underrating their value, were so many breaches of the constitution, and so many mischiefs inflicted upon the States.”\(^{474}\) These laws were a “violation of the constitution of the United States, which clearly intended that foreign coins should circulate among us.”\(^{475}\) To Benton, the wording of the document “could leave no doubt…that foreign coins were intended to be forever current within the United States.”\(^{476}\) In 1834, editors of \textit{The Globe} similarly conjectured that “the Constitution expressly enumerates foreign coin as the currency of the land.”\(^{477}\) In

\(^{472}\) Benton, 448.

\(^{473}\) Ibid., 444.

\(^{474}\) Ibid.

\(^{475}\) Ibid., 446.

\(^{476}\) Ibid., 445.

\(^{477}\) “Washington,” \textit{United States’ Telegraph} (Washington, D.C.), October 9, 1834. \textit{19\textsuperscript{th} Century U.S. Newspapers}. 

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1838, Felix Grundy of Tennessee likewise felt that “No express power is given to prohibit the circulation of foreign coin; the express power is *to regulate its value,*” yet conceded that Congress “no doubt could positively prohibit the circulation of all foreign coin, if it were discovered that its circulation was injurious to our own coin.”  

Regardless of constitutionality or whether the Mint could produce enough coinage for domestic use, many felt that the recoining of foreign coins into American coins was uneconomical. In 1805, John G. Jackson proclaimed that “All economical writers agreed that the wealth of nations was intimately connected with the quantity of the circulating precious metals” and, therefore, it was “impolitic to restrict the circulation of foreign coins in the United States [and] money should circulate more extensively than it ever had done.”  In 1834, Thomas Hart Benton questioned the “foolish and expensive operation” of recoining foreign coinage at the Philadelphia Mint. As late as 1843, the editors of *The Madisonian* still expressed strong sentiments against the “very little judgment or economy exercised by our Government in relation to this subject.” They continued:

> It is certainly a foolish practice for any nation to recoin the precious metals of another nation. If this foolish and expensive practice were carried out in all instances, every Government, in the course of a few years, would have to be at the expense of recoin their own money…To recoin money, whose value everyone can learn, and which may always be declared by law, is certainly most gross waste and


479 “Thursday, December 19,” 2.
improvidence.—There might be some excuse found in monarchical Governments for this practice; but certainly none in ours.\textsuperscript{480}

In addition to the unnecessary expense, \textit{The Madisonian} argued that foreign coinage was the perfect medium to use for foreign transactions, so the Mint actually performed a disservice to businesses conducting international trade.

Some individuals understood that a supply of foreign coinage was useful, even if not used for domestic circulation. In 1834, Thomas Hart Benton complained that the Mint sometimes restruck foreign coinage into United States dollars, only for a merchant to export the new coin almost immediately after. He cited a report from the Director of the Mint and emphasized “that the new coined gold was transferred direct from the national mint to the packet ships, bound to Europe [and that] the national mint had degenerated into a domestic manufactory of gold and silver, for exportation to foreign counties.”\textsuperscript{481} Even after the discovery of gold in California, people lobbied for a supply of foreign gold coinage. Thomas H. Bayly, lawyer, judge, and politician from Virginia, in fact, decided that the discovery “has changed the policy of the country” concerning foreign gold coinage. “Because there will constantly be an exportation of gold and silver and an importation to adjust the balance of exchanges,” Bayly reasoned, “it is better to export it in the shape of foreign coin than American coin.”\textsuperscript{482} As late as 1916, the United States, Great Britain, and France performed “a

\textsuperscript{480}“Our Coinage, Mints, &c.,” \textit{The Madisonian} (Washington, D.C.), March 20, 1843, 1.

\textsuperscript{481}Benton, 447.

perfect economic absurdity” of restriking the coinage of each other for domestic use, only to have it exported and recoined once again.483

Furthermore, for over 50 years, American consumers and merchants had little incentive to send their foreign coinage to the Mint. If a merchant sent 300,000 Spanish-American dollars to the Mint in 1797, for example, John Nicholas estimated that he or she would have to wait 17 weeks for the Mint to recoin them.484 The process involved additional costs associated with shipping the coins to the Mint, as well as a nominal fee for the minting process itself. Some feared that if the government required everyone to send all foreign coins to the Mint at once, the large banks would receive preference by the Mint, and private individuals would have to wait an extended period of time to receive their coinage back, bringing daily commerce to a halt. Nicholas even questioned the utility of having a mint and asked, “Were gentlemen to be indulged in their play-thing at the expence [sic] of the people?”485 That same year, Boston lawyer and politician Samuel Sewall asked, “Why force individuals to bring their crowns into the mint? What advantage would there be in it?” Ultimately, he concluded that he “was not for putting any class of people to inconvenience. It were best,” he understood, “to let the business of foreign coin remain without restraint.”486

In 1848, George E. Badger, Senator from North Carolina wondered why merchants


484 “Congress: House of Representatives,” 2.

485 Ibid.

486 Ibid., 3.
with “this large amount of foreign coin…and there be a necessity for its re-coinage” were reluctant to have it recoined at the Philadelphia Mint. While he regarded the expense of transportation and the insurance a “trifling” amount, others noted longstanding reasons not to do so. Badger argued that “an individual having a small sum in foreign gold will not subject himself to the inconvenience of going to Philadelphia to get it coined—he would sooner part with it below its value.” For as long as they were accustomed to the system, few people saw any economic benefit in sending their foreign coinage to the mint.

Other individuals did not object to the circulation of foreign coinage, but to the legal tender status of such coins. In 1797, Samuel Sewall contended that “the question was not whether they should say foreign coin should not be received at all, but whether, by our law, a man shall be obliged to receive it, which would be giving full credit to the coin of a foreign government.” His primary concern was that any foreign nation could alter the alloy of a coin without the knowledge or regulation of the United States. He used the new coinage of the French Republic as an example, pointing to the fact that it contained less gold and silver than the coins issued under the monarchy. “It would certainly be more honourable to government,” Sewall concluded, “that our citizens should not be forced to receive foreign coin in payment.”


488 Ibid.

489 “Congress: House of Representatives,” 2.

490 Ibid.
However, he understood that Americans could determine the value of a foreign coin and use it in payment if (and only if) the recipient was willing to accept the coin. Similarly, George Dent, planter and politician from Maryland, decried the fact that government gave “a sanction to foreign coin which was not given in any other country.”\(^491\) In 1834, the editors at the *United States Telegraph* in Washington, D.C. also saw “the ignorance and folly put forth” in making foreign coinage a legal tender.\(^492\) They conceded, “True, the Constitution says that Congress shall have power (if they choose to exercise it) ‘to regulate the value of foreign coins;’” but, “the editors questioned, “does it therefore follow, that all foreign coins, or any foreign coins, must be made legal tenders?”\(^493\) While the editors did not wish for forced acceptance of foreign coinage, they did not object to its general circulation.

Throughout the early 19\(^{\text{th}}\) century, a variety of foreign coins retained their legal tender status in the United States. In 1797, once Congress had ascertained that the Mint had not fulfilled its expectations to replace the foreign coinage in circulation with domestic pieces—and, in fact, the situation was *worse* than in the earlier part of the decade—they extended the law for another three years. Similar debates took place in 1800, 1803, 1806, 1809, 1812, 1815, and 1818. The final set of debates led to the Coinage Act of 1819, which suspended the legal tender status of all foreign coinage except Spanish-American silver and its fractions, and ended the practice of renewing the expired law every three years. Even the dollar coins of Mexico and the other

\(^{491}\) Ibid.


\(^{493}\) Ibid.
freshly independent South American nations—often higher in purity than their colonial-era counterparts—ceased to be a legal tender.494

With the legal-tender status of several foreign coins rejected, Secretary of the Treasury William H. Crawford appeared anxious to increase the output of the Mint in order to make a full transition to a domestic coinage. In 1819, he estimated that the mint could produce about three million dollars in silver per year, but “if this capacity should be doubled, the repeal of the law making foreign silver coins current, might be effected with safety.”495 Mint Director Patterson understood that the physical Mint, still in the same location of Seventh and Filbert in Philadelphia since 1792, could no longer facilitate the coinage needs of the United States. [See Figure 47]. It never really did. He noted that, “As far as respect to a double coinage…a new building would be required.”496 His estimate of $25,000 included a parcel of land, a new building, and additional minting equipment, and could be operational in about one year. The lot and building that the original mint occupied “would probably bring from 12 to 15,000 dollars” at auction.497 By 1829, the Mint purchased new minting equipment, and a new building (completed in 1833) at the corner of Chestnut and Juniper in Philadelphia allowed for an increase in United States coinage [See Figure 48].

494 Benton, 445.


497 Ibid.
Mintage records indicate an increase in the output of half dimes, dimes, and quarters from the Mint—the coinage least likely to be exported, thus circulating in the United States—as well as regularity in their issuance. For example, the Mint had not struck a single half dime since 1805 (and in limited quantities), though with the new equipment, it produced an average of 1.67 million pieces per year in the following decade, and annually until replaced by a copper-nickel coin in 1873.\footnote{Bressett, 138–141. Although the half dime was discontinued for a copper-nickel substitute in 1873, the Mint had already begun to produce the copper-nickel five-cent coin in 1866.} Still, even with a larger minting facility, foreign coinage continued to circulate as an integral component of the United States monetary system. For as long as the coins proved recognizable, American consumers and merchants proved willing to accept them.

**Changed Coins, Changed Sentiments: 1840s–1850s**

By the 1840s, fewer people spoke in favor of foreign coinage in circulation. At that time, the main source of foreign coins shifted from international commercial transactions by merchants to the first large-scale wave of immigrants into New York City. As early as 1836, Alderman Tallmadge of the New York City Council reported on the problems the city faced. With three-quarters of imported foreign gold and silver coming into that city, Tallmadge stated that “the Public were suffering much inconvenience” and that he was “surprised that the city had remained so quiet for so great a length of time.”\footnote{“Another Mint,” *Daily National Intelligencer* (Washington, D.C.), November 10, 1836. 19th Century U.S. Newspapers.} American consumers and merchants quickly deemed as unusable the new types of foreign coinage brought into the nation. The increase in
demand from New York City caused a 90-day delay for coinage from the Philadelphia Mint. In addition to the financial burdens, the new source of foreign coinage forced the conversation to change to the unfamiliarity of the coins, nationalism, and ultimately the need for an “American coin.”

Under the collectorship of Cornelius van Wyck Lawrence, the Custom House of New York City ushered unprecedented numbers of immigrants into the United States, but also spearheaded the fight against foreign coinage. These individuals and families came from many places, and for a variety of reasons. Long before Ellis Island, the primary port of entry was the New York City Custom House. Formerly a member of the House of Representatives (Jacksonian-NY, 1832–34), the first popularly voted Governor of New York (Democrat, 1834–36), and President of the Bank of the State of New York (1836–45, 1849–56), Lawrence’s time as Custom House Collector was markedly different in scope—not only from his own experiences, but also from those of earlier Custom House Collectors. Beginning in 1845, his appointment coincided with the beginning of a 15-year spike in immigration to the United States. Every year saw at least 100,000 European immigrants, with an apex of nearly 428,000 people in 1854. This spike was interrupted only by the Civil War.


502 Migration Policy Institute, “Legal Immigration to the United States, 1820–2014,” *U.S. Immigration Trends*, accessed May 14, 2016. Prior to this, the only year to surpass 100,000 people was 1842, with under 105,000 immigrants.
The increased number of immigrants brought with them an increased amount of gold and silver. The gold and silver coinage that passed through the New York City Custom House contributed 40 percent of all gold and silver that entered the nation.\textsuperscript{503} In real amounts, this totaled about \$2 million in 1845, and was mostly in the form of gold coin.\textsuperscript{504} In 1848, Secretary of the Treasury R.J. Walker estimated that \$8 million arrived annually with immigrants.\textsuperscript{505} In 1850, Senator Daniel S. Dickinson of New York predicted that the amount “will, in all probability, be increased hereafter, as those recently migrating are generally of a class possessing more means than their brethren who preceded them a few years since.”\textsuperscript{506} It must have come as no surprise, then, when the “Commercial Correspondent” of the \textit{Daily Union} reported that this amount had indeed increased to an estimated \$12 million in 1851.\textsuperscript{507}

However, the origins of the immigrants and the types of coins they brought with them created a new problem. Most of the coins they carried never circulated in the United States on a large scale. Americans were unable to recognize a growing

\begin{footnotes}
\item[504] “Quantity of Gold and Silver in the U. States,” \textit{Mississippi Democrat} (Carrollton), June 4, 1845.
\item[506] “In Congress of the U. States.”
\end{footnotes}
percentage of the coins in circulation. Although most American consumers and merchants had the knowledge of many different varieties of foreign gold and silver coinage—Portuguese half-joes, French five-franc coins, or Spanish dollars, which became “nationalized through long use”—other, less-recognizable types of coins began to enter the United States monetary system. Americans had used the former coins for more than two centuries and had based their pricing structures and, indeed, entire monetary system on them. More and more, immigrants came from locations not associated with prior immigrants, most notably the large number of German States. Before German unification in 1871, the various German States used different monetary systems from one another. Even if two coins from different German States did have the same value, an American consumer or merchant had difficulty in discerning this since the coins looked different, with different designs, in a different language, and of a different denomination and size than they were ever accustomed to handling. The same situation existed with coinage from the Italian States until 1861. Americans were “unacquainted with the appearance and value of strange coins [and] it is in vain to expect them to circulate freely.” In 1848, Senator and future Secretary of the Treasury John A. Dix stated that the new foreign coinage circulated “as much so as if they were medals or watch cases,” and “as if it were in the form of bars or ingots.” Ultimately, Dix concluded, “Fitness or capacity for circulation is an


510 Houston, 889.
New York City was not the only location to feel this symptom as Stephen Douglas noted in 1850:

> It has been stated that eight millions of dollars in foreign gold is brought into the city of New York by immigrants, and passes into the interior in that form; and in the country where I live, upon the whole line of the lakes and western rivers, where the immigration goes, we feel the inconvenience of that foreign coin, the value of which is not generally understood by the community among which it goes into circulation.\(^5\)

“You might as well circulate a book in a foreign language among the millions—a spelling book in Greek, or a Bible in Hebrew,” joked Senator Daniel S. Dickinson of New York.\(^6\)

To keep up with the new wave of foreign coins and keep consumers and merchants up to date with their comparative values, the treasury department performed non-scheduled assays. On May 22, 1846, for example, Treasury Secretary R.J. Walker issued a circular “to amend existing laws.” [See Figure 49]. This exchange-rate chart did not list the foreign coinage common since before the Revolution, but only a series of obscure foreign coins that had recently entered the nation, and proved unrecognizable to American consumers and merchants. No one could wait until the assay of the following year. New coins included the specie dollar of Denmark and the specie dollar of Norway and Sweden; the liras of Lombardo, the Venetian kingdom, 

\(^5\) Ibid.


\(^7\) In Congress of the U. States.”
and Tuscany, and the lira of Sardinia; and ambiguous discrepancies, such as between the "thaler of Prussia and northern states of Germany" and the "florin of southern states of Germany."\textsuperscript{514} [See Figure 50]. Although these coins entered the commercial channels of the United States and were included on exchange-rate charts, they never became legal tender.

The information on exchange-rate charts for foreign coinage grew dramatically in number and the values grew more unfamiliar. For example, the \textit{Farmer's Almanack} of 1800 only included exchange-rate charts for coins that held legal-tender status: English, Portuguese, French, and Spanish gold coins.\textsuperscript{515} [See Figure 51]. These early charts did not list individual coins by denomination, only by country. Instead, the chart included a list of grains (from one to 23) and pennyweights (from one to 20), followed by the corresponding price in dollars and cents (and sometimes in pounds, shillings, and pence). In general, consumers and merchants weighed their gold coins with their troublesome scales and compared them to the chart to determine their value. By the time this practice stopped, exchange-rate charts listed coins individually, without mentioning their weight. The 1808-edition of \textit{The American Tutor's Guide}, which contained one of the earliest charts to define individual coins, listed five gold coins and four silver coins, but continued only to use issues from the four countries named above.\textsuperscript{516} In 1848, the textbook \textit{Higher Arithmetic} listed nine foreign gold coins and

\textsuperscript{514} "Circular: To Collectors and Other Officers of the Customs," \textit{Boon's Lick Times} (Fayette, MO), September 5, 1846, \textit{Chronicling America: Historic American Newspapers}, Library of Congress.

\textsuperscript{515} Robert B. Thomas, \textit{The Farmer's Almanack}, 179.

\textsuperscript{516} James Thompson, \textit{The American Tutor's Guide}, 37.
22 silver coins, while *The American Almanac* (1852) included the values for 48 foreign gold coins and 86 foreign silver coins from 44 different states or territories. [See Figure 52]. These not only included coins from the countries listed above, but also coins such as the gold Russian five rubles (worth $3.967) and Persian tomaun (worth $2.23), or the silver rupee of Hindustan (worth $0.445) and Turkish 20 piastres (worth $0.80).517

The strangeness of these coins was vexing to many native-born Americans, and some expressed concern that the unfamiliar devices and incomprehensible inscriptions left the foreign coinage “in a shape not suited to be used as money.”518 As early as 1834, Thomas Hart Benton complained that, “Not only the well-known coins of the principal nations were provided for in [exchange-rate charts], but the coins of all the nations with whom we traded, how rare or small might be the coin, or how remote or inconsiderable might be the nation.”519 In 1846, Senator Daniel Webster submitted a petition to Congress on behalf of a group of merchants from Boston who hoped that future circulars for foreign coinage “may not be made to embrace Turkish coins,” which, with inscriptions in Arabic, were regarded as too unfamiliar to effectively circulate in the United States.520 Furthermore, inherent differences in monetary

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519 Benton, 445.

systems—mostly through variations in fineness and weight—often left these foreign coins valued at odd prices in relation to United States dollars. Most Latin American dollars held a legal value of one dollar each in domestic prices, while assayers at the Philadelphia Mint determined the value of specie dollars of Norway and Sweden at $1.06, those of Denmark at $1.05, and French five-franc coins at $0.93 each. Other coins faced completely unrealistic exchange rates. A lira from Sardinia, for example, was worth $0.186 in United States dollars. The extra $0.006, of course, was impossible to fully reckon when using a single coin, the loss likely going to the holder of the coin. “As American coin it would circulate more freely, and the people would be saved from the trouble and losses incident to the circulation of the foreign article,” proclaimed one proponent of recoining.

While the exchange rates allowed these newly-introduced foreign coins to somewhat conform to the decimalized United States dollar, the coins continually proved impossible to conform to the shilling-pence systems so engrained into the day-to-day commerce of the different regions of the United States.

The topic came up in the annual reports from the Treasury Department. From 1845 to 1849, Secretary of the Treasury Robert J. Walker was one of the most vocal supporters for recoining foreign gold and silver coinage as it entered the United States.

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*Foreign and Domestic Commercial Calculator; or a Complete Library of Numerical, Arithmetical and Mathematical Facts, Tables, Data, Formulas and Practical Rules, for the Merchant and Mercantile Accountant* (Boston: E.S. Winslow, 1854), 21–27. Coins of the Ottoman Empire turned Turkey used the Arabic script until the 1930s.

521 “Circular,” *Boon’s Lick Times* (Fayette, MO), September 5, 1846.

522 “The ‘One-Man Power.’”
His readings of the Treasury Report reminded Congress of the problems faced by Lawrence in the New York City Custom House.\footnote{James K. Polk, 	extit{The Diary of James K. Polk During His Presidency, 1845 to 1849} (Chicago: A.C. McClurg & Co., 1910).} In 1845, Walker noted that “the foreign coins do not circulate in the way of business, but if thus passed through the mint, they would go to swell the amount of federal coin,” and that “the process would be much more rapid if aided by…the establishment of a branch of the mint at the great commercial emporium of the Union.”\footnote{Robert J. Walker, “Report of the Secretary of the Treasury,” 	extit{Wilmington Journal} (Wilmington, NC), December 19, 1845, 2. Walker was not the first to recommend a Mint in New York City. Alderman Tallmadge made the same request in his 1836 proposal cited above.} In 1848, Walker further noted that “little coin comparatively has gone from New York, transmitted voluntarily by individuals for recoinage to Philadelphia,” as few individuals distant from the latter city went through the hassles of recoining. He cited the risk, expense, and delay that individuals did not want to subject themselves to. Again, he suggested the establishment of a branch mint in New York.\footnote{Robert J. Walker, “The Annual Report of the Secretary of the Treasury, &c. &c. &c.,” 	extit{The New York Herald}, December 12, 1848, 1.} The editor of the 	extit{Daily Union} called the proposed New York City Mint “a measure of great consequence to the merchants and government of the country.”\footnote{Morgan, “Editor’s Correspondence,” 	extit{Daily Union} (Washington, D.C.), March 27, 1846, 	extit{Chronicling America: Historic American Newspapers}, Library of Congress. Online.} The idea, however, never became a reality. Powerful New York City bankers long profited from the local substitution of foreign specie for paper money and lobbied against the branch mint. Ultimately, Senator George E. Badger—a Whig
from South Carolina and characterized by contemporaries as a hater of hard money—
filibustered the bill for a New York Mint into oblivion in early 1849.527

With prospects for a New York City Mint gone, others continued to express
similar distress about the changing medium of the nation and how it did not conform
to the familiar monetary system. In 1851, Treasury Secretary Thomas Corwin
proclaimed that “The foreign gold coins do not, and it is feared will not, circulate
generally as a currency.”528 He succinctly expressed each concern with the new types
of foreign coinage:

The rate at which these coins are fixed by law is not familiar to the
people; the denomination of such coin is inconvenient; the parts into
which it is divided are not decimal; the rates at which it is taken vary in
different parts of the Union. It is inconvenient in the way of ready
transfer in counting; it is more difficult, in common use, to distinguish
the genuine from the counterfeit foreign coins; and the stamp upon it is
not familiar to the people—from all which causes, a foreign gold coin
does not, and will not, circulate generally as a currency among the
people.529

In 1851, editors at The Bankers’ Magazine similarly opined that merchants should
have the ability to change their foreign coin into American coin “in a few hours or
moments.”530 The editors also noted the expense and risk, but felt that the delay that a

527 “The ‘One-Man Power.’”

528 Reports of the Secretary of the Treasury of the United States, prepared in
Obedience to the Act of May 10, 1800, Volume V (Washington, John C. Rives, 1851),
19.

529 Ibid.

530 “The New York Branch Mint,” The Bankers’ Magazine and Statistical Register,
Volume 5, No. 5 (November 1850), 382.
merchant experienced caused the greatest financial loss. Furthermore, “the foreign coin, consisting of denominations unknown to the great body of our people, is almost useless for the purposes of general circulation…It is the rapidity of the circulation of coin that gives its chief values.”531 The large, consistent, and new supply of coins from European locations with monetary systems largely unfamiliar to Americans had begun to divert into the United States, and consumers and merchants did not know what to make of it.

In addition to the increasingly confused state of monetary affairs, the combination of immigrants from previously uncommon locations, the new range of foreign coinage that poured into the United States, and the unfamiliarity that Americans had with both provoked a sense of patriotism, nationalism, and nativism. Whether private individuals writing to their local newspapers, or Congressmen in session, disdain towards the domestic circulation of foreign gold and silver coins often exposed mounting anxieties over national sovereignty, state building, and what it meant to be American. This was not necessarily a new phenomenon. In 1830, for example, the Daily National Intelligencer of Washington, D.C. published the lyrics to “a new patriotic song” entitled “American Coin.”532 [See Figure 53] Nationalist themes emerged in lyrics such as “Ye should value her eagles before ye, And send them all over the world!” or “Oh LIBERTY! Stamp’d on our coin, With laurels unfading bedeck The brows of thy leaders, who join To trample on Tyranny’s neck.” And, of course, the chorus: “Let ‘Liberty’ long be our motto, And high may her bright

531 Ibid.

banner wave; And he who don’t value her blessings Deserves to be spurn’d as a slave!” However, conservative Americans could direct their nationalism at the wave of immigration in the 1840s and 1850s, and they often encountered the new coinage with similar sentiments. Words and phrases the public used paralleled nativist and nationalist rhetoric. Even the resulting Coinage Act of 1857 was a powerful and outward display of national growth and sovereign might, with an accompanying dose of American hubris.

The foreign coinage reminded Americans of their European monarchical origins, as well as the republican government that they preferred. In 1843, for example, *The Madisonian* quipped at the variety of monarchs represented on the coins of Europe—many of which had increasingly become a part of the United States monetary system:

They wish to indulge the vanity of every new successive sovereign, by placing his image on the coin of the realm; while at the same time the expense, which goes to retainers, but serves to uphold the throne. It is not so with our Government.—We permit no man’s image to be stamped upon our coin—they can only bear national emblems, the Eagle and image of Liberty—and they will be changed, we trust, for no other, while we remain a Republic, or a people.534

Here, *The Madisonian* took pride in the representations of Lady Liberty and the American Eagle that graced the domestic coinage. European coinage, they criticized, served as a vain attempt at holding onto monarchical power, a quality the United

533 Ibid.

States government did not tolerate. The sense of nationalism was compounded with the author’s hope that the national emblems on United States coinage should never change.

Individuals used terms associated with national expansion in discussions of restriking foreign coinage into American coin. In 1853, for example, lawyer and politician from New York David L. Seymour proclaimed that, “It is manifestly the interest of this Government that foreign coin coming here stamped in foreign countries, not easily recognized, and not freely passing among our citizens engaged in commerce, should be recoined, and receive the stamp of the coin of our own country.” 535

It was not long prior to this statement, only in 1845, that journalist, lobbyist, and expansionist Jane Cazneau coined the phrase “manifest destiny” in an essay entitled “Annexation” which discussed the addition of Texas into the United States. 536 This term quickly spread. According to Robert J. Miller, the term characterized the “irresistible” 19th-century belief that the United States and the “special virtues of the American people and their institutions” would expand across North America. 537 Seymour provoked the same desire to conquer the foreign coinage found throughout the United States and claim them as American once and for all.


536 Linda S. Hudson, Mistress of Manifest Destiny: A Biography of Jane McManus Storm Cazneau, 1807–1878 (Austin: Texas States Historical Association, 2001). History had named John L. O’Sullivan as the person who coined “manifest destiny” (largely due to publication practices of the 19th century); however, Hudson shows that it was likely Cazneau who wrote that particular article.

537 Robert J. Miller, Native America, Discovered and Conquered: Thomas Jefferson, Lewis & Clark, and Manifest Destiny (Greenwood, 2006), 120.
Some individuals simultaneously used degrading language to describe foreign coinage with terms of endearment to describe the United States dollar; terms consistent with words used to evoke nativist sentiment. “I beg,” wrote one concerned individual to the editor of the *New York Herald* in 1856, that Congress “relieve us of the foreign trash that now circulates instead of our own beautiful decimal currency.”\textsuperscript{538} The term “foreign trash” had connotations in certain contexts in early-19\textsuperscript{th} century United States. Critics used the term almost exclusively to describe foreign literature that publishers printed in excess and at a highly discounted rate, as these works were not subject to domestic copyright laws. In 1838, for example, the *Southern Literary Messenger* bemoaned “an immense deluge of foreign trash—aye, and poison, too—is one consequence; an incalculable addition to that evil, justly deemed one of the greatest in modern Literature; namely, the needless multiplication of books.”\textsuperscript{539} Similarly, in 1847, the *Democratic Review* discussed differences between “native authorship” and “the foreign trash which the cheap re-publishers vended” along with the “wholesome elements of the American character.”\textsuperscript{540} When Charles Frederick Briggs spoke of “foreign trash” in his 1847 novel *The Trippings of Tom Pepper*, he noted that people yearned for work that was “indigenous, and born of the better life of the country, has a natural desire, or rather a patriotic wish” and “free from all foreign


\textsuperscript{539} *The Southern Literary Messenger Devoted to Every Department of Literature and the Fine Arts, Volume 4* (Richmond: Thos. W. White, 1838), 229.

influences.” These were the same sentiments that the individual who wrote the *New York Herald* in 1856 demonstrated when he or she asked for relief from “the foreign trash” and access to “our own beautiful decimal currency.”

The circulation of foreign coinage led to statements that evoked the Americanization and naturalization of immigrants. In his 1847 annual address, for example, Treasury Secretary Walker expressed such sentiments in discussing the restriking of foreign coinage. While subdued in tone, his words are grandiose in scope and expectation. While he still advocated for a mint in New York City, he stated:

> We would soon supply our own people with our own coin, and in time, also, with our augmenting commerce, Americanize, to a great extent, the coin of the world; and thus introduce our simple and beautiful decimal currency gradually throughout all nations, substituting it for the complex system of pounds, shilling, and pence, or of doubloons, ducats, and rupees, which retard business and complicate accounts. [American coin] must soon begin to diffuse itself into other nations, for their benefit as well as our own.

Like the Spanish Empire before it, the United States had ambitions to spread its American coinage worldwide. In 1851, an author for the *Daily Union* demanded provisions “to naturalize the foreign silver coins amongst us by giving them the American stamp.” He or she felt that this should have occurred with the Coinage Act of 1853, “but, unfortunately, the government was not in the right hands. Certainly the

541 Harry Franco, pseudonym, *The Trippings of Tom Pepper; or, the Results of Romancing* (New York: Burgess, Stringer & Co., 1847), 71.


Mint was not properly directed.” Finally, in 1857, with the passage of the Coinage Act in sight, some individuals exposed their true feelings of foreign coinage and of immigrants. “We are with coins just as we are with foreigners,” unabashedly proclaimed the *Indiana American* in 1857:

> Let them be Americanized—*naturalized* before they take any controlling part in the business or politics of the Country.—As we do not want these to vote before they become Americans, so we do not want their coins to circulate until the impress of the American Eagle is put upon them. When that is done we don’t care where they came from, let them pass and repass.\(^{545}\)

So long as the coins passed through the Mint and became “Americanized,” they could circulate in the United States, just as the immigrants needed to naturalize before they earned the right to vote, the article claimed.

**Conclusion**

Familiarity with coins proved integral to their circulation within a monetary system. Foreign coins that did not precisely conform to a particular mode of reckoning did not circulate. Thomas Jefferson understood this when he created the United States dollar in 1785 and Robert J. Walker understood this when he called for a New York

\(^{544}\) “The Silver Question,” *Daily Union* (Washington, D.C.), January 30, 1851. While this supposed neglect may have seemed like an obvious prevention, it likely would not have worked. Just like all the foreign coinage that circulated in the United States up to that point, an “American coin” also faced possibilities of exportation, and many United States coins had faced exportation before and since this anonymous statement in 1851.

City Mint to restrike all of the unfamiliar foreign coinage coming from central Europe in the 1840s. This was not only the case with foreign coins in the United States in the late 18th and early 19th centuries, but with coinage throughout history in general. While the system that developed in the United States was confusing, inconvenient, and counterfeited often, the American consumers and merchants who used these pieces had a long-standing familiarity with them. For generations, they had painstakingly learned how to navigate the system of foreign coinage and domestic dollars that were united through a grassroots system of shillings-pence; they weighed their suspicious and lightweight coinage to ascertain their authenticity and value; they depended on the accuracy of onerous exchange-rate charts to know the rates between foreign and domestic coinage.

While critics often directed their complaints towards the legal tender status of such coins, they continued to circulate. It was only in the 1840s and 1850s, when a large influx of unfamiliar coins entered the nation, that the monetary system broke apart and Americans required the Mint to restrike the coins in order for them to circulate. The unfamiliarity of the new foreign coinage, in addition to the cultures and customs that the immigrants brought with them, also exposed a heightened sense of nationalism, nativism, and prejudice in the United States toward the outside world. Americans began to discuss the foreign coinage in circulation in nationalist terms and considered the recoining of those coins into an “American coin” a sovereign right that was integral to the commercial growth of the United States and the formation of an American identity.
Figure 44  1 mark (1,000 quarters) of Robert Morris's plan. American Numismatic Society, 2009.52.4.

Figure 45  1787 Fugio Cent, struck by James Jarvis under the Articles of Confederation. American Numismatic Society, 1911.105.678.
Figure 46  1794 United States dollar—the first dollar coin struck under the Coinage Act of 1792. American Numismatic Society, 1965.97.1

Figure 47  The first United States Mint in Philadelphia, ca. 1792. Note its small and inadequate structure—essentially a house with work buildings. The Encyclopedia of Greater Philadelphia.
Figure 48    Second United States Mint in Philadelphia, ca. 1833. The larger neoclassical structure better facilitated the recoinage of foreign coin into American coin. Frederick Gleason, Gleason’s Pictorial Drawing-Room Companion (Boston: 1852).
Figure 49  Circular Issued by Treasury Secretary R.J. Walker to update consumers and merchants of new foreign coinage that had since entered the United States, May 22, 1846. "Circular," Boon's Lick Times (Fayette, MO), September 6, 1846, 1.

| Specie dollar of Sweden and Norway | $1.08 |
| Specie dollar of Denmark          | 1.03 |
| Thaler of Prussia and northern    |       |
|   states of Germany              | 0.69 |
| Florin of southern states of      |       |
|   Germany                        | 0.40 |
| Florin of Austrian Empire and     |       |
|   city of Augsburg                | 0.42 |
| Lira of the Lombardo—Venetian     |       |
|   kingdom, and lira of Tuscany    | 0.86 |
| Franc of France and of Belgium,   |       |
|   and lira of Sardinia            | 1.86 |
| Ducat of Naples                   | 0.80 |
| Ounce of Sicily                   | 0.20 |
| Pound of British Provinces of     |       |
|   Nova Scotia, New Brunswick,     |       |
|   New Foundland, and Canada       | 4.00 |

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CIRCULAR

To Collectors and other Officers of the Customs.

For your information and government, I have to call your attention to the annexed act of Congress, approved the 22d May, 1846, entitled "An Act to establish the value of certain foreign coins and moneys of account, and to amend existing laws."

R. J. WALKER,
Secretary of the Treasury.

AN ACT to establish the value of certain foreign coins, and moneys of account, and to amend existing laws.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That in all computations at the custom house, the foreign coins and moneys of account herein specified, shall be estimated as follows, to wit: The specie dollar of Sweden and Norway, at one hundred and six cents. The specie dollar of Denmark, at one hundred and five cents. The thaler of Prussia and the northern states of Germany, at sixty-nine cents. The florin of the southern states of Germany, at forty cents. The florin of the Austrian Empire, and of the city of Augsburg, at forty-eight and one half cents. The lira of the Lombardo, Venetian kingdom, and the lira of Tuscany, at sixteen cents. The franc of France and of Belgium, and the lira of Sardinia, at eighteen cents six mills. The ducat of Naples, at eighteen cents. The ounce of Sicily, at two dollars and forty cents. The pound of the British Provinces of Nova Scotia, New Brunswick, New Foundland, and Canada, at four dollars. And all laws inconsistent of this act are hereby repealed.

Approved, May 22d, 1846.

VALUE OF FOREIGN COINS.
As established by an act of Congress, passed May 22, 1846.
Figure 50  1798 silver thaler of Anhalt-Bernberg and 1854-B gold 10 thaler of Hanover. Two of many different types of new silver and gold foreign coins to enter the United States in the 1840s and 1850s. American Numismatic Society, 1893.14.216 and 1966.164.311.
Figure 51  Early Exchange-Rate Chart. Robert B. Thomas, The Farmer’s Almanack (1800), 179.
Figure 52  Late Exchange-Rate Chart. James Bates Thomson, Higher Arithmetic; or the Science and Application of Numbers; Combining the Analytic and Synthetic Modes of Instruction (New York: Mark H. Newman & Co., 1848), 351.
Figure 53  Figure "American Coin – A New Patriot Song,” Daily National Intelligencer (Washington, D.C.), July 5, 1830.
Chapter 6

THE CIRCULATION OF FOREIGN COINAGE IN THE UNITED STATES: SUMMARIZATION, CONTRIBUTIONS, AND FUTURE WORK

The circulation of foreign coinage in the United States in the 18th and early-19th centuries was a paradox. Coins with European monarchs and Latin inscriptions traded between people who had recently revolted against European authority and mostly spoke the English language. In order for these coins to circulate properly—an economic necessity in the young and cash-strapped nation—Americans adopted the coins and imparted their own meaning onto them. Monetary exchange is a social function similar to language. Just as individuals unfamiliar with a language cannot properly communicate with native speakers, individuals unfamiliar with the intrinsic qualities of a coin cannot confidently accept the money from those who regularly use it. In the same way that particular written scripts or spoken languages make sense to specific populations, most people are comfortable using a small handful of the many monetary systems of the world. The questions “What does that mean in English?” and “How much does that cost in dollars?” perform similar functions for an American abroad: a request to instill something with relatable meaning. When foreign coinage circulated in the United States, Americans created their own concepts of value, their own conversion systems, and their own methods of exchange. These were, in fact, the monetary equivalents to the dictionaries, thesauruses, and languages that facilitated written or spoken communication.

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Just as many societies identify with their language and see it as central to their culture or civilization, the money that groups of people use helps formulate a shared identity. It is evident that foreign coinage directly impacted the formation of the United States dollar and, as a result, the very idea of what it meant to be “American.” Both Robert Morris and Thomas Jefferson understood that Americans already identified with these coins when they proposed their monetary systems in the 1780s. The foreign coins that circulated through the colonial period continued to circulate and influence the mechanics of the United States dollar and the American conceptualization of money. By the 1820s, Americans identified more with shillings and pence than they did with dimes and cents. In the 1850s, the nativists who called for “American coin” did not realize that they already had them. The Spanish-American dollars, English shillings, Portuguese half-joes, and French crowns that circulated long before the establishment of the United States were American coins.

Decimalization modernized the United States dollar, yet foreign coinage continued to circulate. The decimal dollar proved key to simplified commercial exchanges and contemporaries knew as much. Even before the Philadelphia Mint struck a single cent, individuals who learned decimal money praised its simplicity. The years it took to even build the Mint, and the decades it took for the Mint to adequately fulfill the national demand for specie, however, necessitated the continued circulation of foreign coinage. Those who supported the circulation of foreign coinage did not do so solely because of the familiarity that Americans had with those coins. Again, they had legally adopted the superior decimal system. Rather, the longstanding familiarity that Americans had with foreign coins enabled individuals to exchange those pieces when federal coins were unavailable. Otherwise, an unfamiliarity with a
particular group of coins would halt their circulation. If enough unfamiliar coins entered circulation in a short amount of time, as occurred in the 1840s and 1850s, it cut the monetary supply and slowed commerce.

Until that happened, Americans demonstrated extraordinary levels of tolerance towards the simultaneous circulation of multiple monetary systems even as it posed significant challenges for businesses. The United States did not yet have a nationally integrated economy, but rather a patchwork of local and regional economies that diverged from the original British system, and also from each other. Local strategies flourished as the national system did not yet permeate through the economy. Americans showed impressive ingenuity in incorporating elements of several different foreign currencies into local monetary systems. This was true in the official adoption of the United States dollar in the image of the Spanish-American dollar, in the grassroots evolution of the state shilling-pence system of pricing, and even in the methods that individuals devised to cheat the system. Americans created many methods to successfully accommodate the simultaneous use of foreign coinage and the United States dollar. Though complicated, the patchwork system worked.

Despite the local methods devised to deal with the coins, the fact that foreign coinage—more specifically, the imperial coinage of global hegemony—circulated in the colonial period and into the early Republic shows that the young nation was a part of an increasingly integrated world. The Spanish-American, British, French, and Portuguese coins that circulated became a part of the new American system. This was true in the legal sense as many laws deemed these coins “current” within the nation, and as Jefferson borrowed “dollars,” “dismes,” and other aspects of European coinage in creating the domestic system. This was also true in the literal sense. Much like the
millions of immigrants who entered the “melting pot” of America, the majority of silver and gold foreign coins that circulated in the United States eventually succumbed to melting pots of the Mint and were recoined into United States dollars and eagles.

This dissertation makes several contributions to the broader field of United States history. First and foremost, it helps historians understand the problems that American consumers and merchants encountered on a regular basis when they conducted business in the 18th and early-19th centuries. It incorporates the processes needed for monetary exchange into the discussion of consumption, rather than focusing simply on the goods and services that people consumed. It presents monetary exchange as a moment of struggle through the 18th and early-19th centuries. This was not only due to the obscure methods of arithmetic needed to understand the conversion process, but also because of the regional variations that existed in pricing goods and services, the constant worry and battle against counterfeit and lightweight coins, and even the simple process of recognizing a coin that an individual received. A goal of this dissertation has been to make present-day readers understand and appreciate the simplicity of the modern United States monetary system.

On the other side of chaos is cohesion. This dissertation further contributes to the broader understanding of 19th-century standardization. While much scholarship on standardization deals with industry and railroads, the addition of 18th- and 19th-century monetary affairs provides a new context. Many aspects of everyday life in the United States standardized (e.g. industry, railroads, music, time, language), making the topic of money difficult for historians of the period to ignore as it also went through a dramatic standardization process. With few objects under greater government regulation than money, studying the monetary system of the late-18th and early-19th
centuries United States reveals the depth of interest that the federal government had in standardization from the time of its foundation.

This dissertation contributes to the evolving understanding of the historical role that the United States played in the globalizing world of the 18th and 19th centuries, and the role that the rest of the world had in the formation of the United States. The fledgling economy of the country would not have developed along the trajectory that it did without the circulation of foreign coinage. The nuances of how the monetary system developed within a global context and how individuals navigated this system, for instance, is important to the broader understanding of American economic history. Before Americans discovered the vast quantities of precious metals within the national borders, one of the few sources of gold and silver (i.e. “money”) was through the importation of foreign coinage. At the time of writing, while the United States government is aggressively closing its borders from foreign influence, this dissertation serves as another reminder of the historical benefits of globalization, international exchange, and open borders. Although, as shown, the circulation of foreign coinage did create some difficulties, 18th and 19th-century Americans adapted and (for a time) accepted the pieces as a legitimate component of the United States monetary system.

This dissertation did not set out to provide a complete history of the monetary conditions that American consumers and merchants faced through the 18th and 19th centuries, thus leaving ample room for future research on this topic. Its focus on private, daily interactions did not include a full discussion on banks. These institutions were integral to the national circulation of both foreign and domestic coin as well as the immense quantities of paper currency. Proceeding from this dissertation, historians
might ask whether banks used the same methods as private consumers and merchants in converting and calculating foreign coinage. What role did banks, including the First and Second United States Banks, have in attracting foreign coinage to the United States?

Similarly, this dissertation did not discuss private economic exchange outside the cash nexus: accounting of bartered goods or of traded services. While the majority of transactions in 17th to early-19th century America likely took the form of a bartered item or traded service, individuals still kept track of these transactions in their account books with profits and losses identified in monetary terms. Future research can explore the methods that consumers and merchants used to convert a bartered item or service into a monetary sum. More work remains to be done on how individuals born into bartering societies or non-European-based economies (e.g. Native Americans) learned to compute transactions with Europeans. How immigrants from non-familiar monetary systems learned to calculate their services in the United States also remains to be explored.

There are also several alternate contexts that can be explored to create a fuller account of Americans’ struggles with the complexities of cash transactions. Military exploits introduced some foreign coinage to the United States. This is especially true with the 19th-century activities of the United States military in northern Mexico and what is now the American Southwest—a source for much of the Spanish-American silver and gold coins that entered the coffers of the government and, often, into mainstream commerce. Likewise, cultural historians could better theorize the role that historically underrepresented groups and individuals played in the circulation of foreign coins. While this dissertation briefly examined arithmetic in the lives of
women, African Americans, and apprentices, more focused scholarship on these key groups would allow historians better understand the role they played as consumers or merchants in the colonial period and into the early Republic.

In December 1776, when Philadelphia silversmith Thomas Shields received payment from customer Joseph Sturgis in six different types of coin from four different monetary systems, they did not likely understand the historical contingencies that brought each of those coins to them. Nor could they anticipate the struggles that generations of consumers, merchants and the government endured to turn the assortment of foreign coinage in circulation into a cohesive national monetary system that all Americans could easily understand. What they could intuitively do, however, was find the value of each coin. Since learning arithmetic at young ages, both Shields and Sturgis had grown accustomed to the use of these types of coins in circulation. Shields likely kept his money scale handy and his eyes and ears open to identify any potentially-suspicious or lightweight coins. As they dealt with Spanish-American reales de a ocho, Portuguese reis, British guineas and shilling, and French écus, Shields and Sturgis both knew to tally the sum of the bill in the regional pounds, shillings, and pence of Pennsylvania. While this system might appear confusing to modern eyes, Shields and Sturgis had simply conducted business in the early Republic.
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