

# THE Pennsylvania Magazine OF HISTORY AND BIOGRAPHY

## *The Birth of an Enterprise: Baldwin Locomotive, 1831-1842*

AT THE CLOSE of the second war with England, Americans began their search for a swift, reliable, and efficient form of transportation. After various experiments with canals and turnpikes, the solution to the problem of internal improvements appeared in that unique combination of "the iron rail, flanged wheel, and puffing locomotive."<sup>1</sup> The industrial growth which would transform the nation by the end of the century pursued a railroad development whose ultimate pattern became as intricate as a spider's web. While this vast network was creating national markets and new manufactures, it was always dependent upon the skills of mechanics and artisans who converted the resources of a bountiful Nature. For any builder who could perfect the machinery of steam locomotion, there were splendid opportunities for a thriving business and a personal fortune. Such a man was Matthias William Baldwin.

In 1817, at the age of twenty-two, he had begun his career as an apprentice jeweler in Philadelphia. Fine craftsmanship and exquisite detail rapidly became his hallmarks. Within two years he had acquired his own establishment, but when the recession of 1825 destroyed the market for his services he was obliged to change his occupation. In partnership with David H. Mason, a machinist and engraver in brass, Baldwin was soon producing etching and book-making tools, hydraulic presses, and copper rolls for printing calico. About 1827, the firm also began to manufacture stationary steam

<sup>1</sup> John F. Stover, *American Railroads* (Chicago, 1961), 11.

engines based upon the successful five or six horsepower model that Baldwin had recently built. Shortly thereafter, the conservative Mr. Mason, disturbed by these constant innovations, abandoned the field to his more enterprising partner.<sup>2</sup>

From the stationary engine it was only a step to the steam locomotive. At the invitation of Franklin Peale, manager of the Philadelphia Museum, Baldwin constructed a working scale model based upon English design. Desiring to try his hand on a full-size engine, he accepted an order from the Philadelphia & Germantown Railroad early in 1832. For about six months he and his mechanics labored in a tiny factory whose only blacksmith's shop was in the cellar. The inconvenience of having the heavy forging performed elsewhere forced Baldwin to move to larger quarters in Lodge Alley, between Seventh and Eighth Streets. There *Old Ironsides* was completed and preparations made for its first run. On November 23, 1832—a half holiday at the Works—the new engine performed successfully on the Philadelphia & Germantown line.<sup>3</sup> She was promptly assigned to a regular schedule of three round trips on days when the weather was “fair”; horses were to be substituted whenever the weather was “not fair.”<sup>4</sup> In the months that followed, the railroad officials found occasion to criticize the engine's performance. Not until the spring of 1833 was the ensuing controversy finally settled when an arbitration committee ruled that Baldwin should receive \$3,600, which was \$400 less than had been specified in the contract. For reasons unknown, he was paid only \$3,500. Small wonder that his discouragement nearly resulted in his first locomotive being his last.<sup>5</sup>

<sup>2</sup> Wolcott Calkins, *Memorial of Matthias W. Baldwin* (Philadelphia, 1867), 21–22, hereinafter, *Memorial*; J. Thomas Scharf and Thompson Wescott, *History of Philadelphia, 1609–1884* (Philadelphia, 1884), II, 1062; III, 2255; Fred H. Dewey and Ernest S. Bates, “Matthias William Baldwin,” *Dictionary of American Biography (DAB)* (New York, 1928–1936), I, 541. The partnership was evidently broken between May, 1830, and May, 1831, although both men continued to share the facilities at 14 Minor St. until about the autumn of 1832. *DeSilver's Philadelphia Directory and Stranger's Guide*, 1830, 1831, 1833. Baldwin's first stationary steam engine is now preserved in the Museum of History and Technology of the Smithsonian Institution, Washington, D. C.

<sup>3</sup> *Memorial*, 49–50; *Pennsylvania Magazine of History and Biography (PMHB)*, XI (1887), 80. For reports of the trial, see *The National Gazette*, Nov. 24, 1832, and the *American Railroad Journal (ARRJ)*, II (Jan. 19, 1833), 36.

<sup>4</sup> *Poulson's American Daily Advertiser*, Nov. 26, 1832.

<sup>5</sup> Ralph Kelly, *Matthias W. Baldwin (1795–1866): Locomotive Pioneer!* (New York, 1946), 15, 27; *Memorial*, 54. A full-size, nonoperating replica of *Old Ironsides* can be seen in the

Several months later, he received a second order, this time from the Charleston & Hamburg Railroad. Before the end of 1834, a total of six engines had been built; thereafter, locomotive construction began to take priority in the shop.<sup>6</sup> Once again the demands of business swiftly outgrew available space. Sometime in the summer of 1835, after the completion of about fourteen locomotives in the Lodge Alley Works, the concern moved to Broad and Hamilton Streets, where it was to remain a prominent landmark for nearly a century.<sup>7</sup> Even in this new plant, Baldwin found it difficult to store a finished engine and was often anxious for his patrons to take immediate delivery.<sup>8</sup> Meanwhile, orders for stationary engines continued to be numerous and profitable. In April, 1837, Baldwin received a contract for steam engines to be fitted in the Philadelphia ice boat, a municipal vessel designed to secure the uninterrupted navigation of the Delaware River. For this work he was paid about \$33,000.<sup>9</sup> After the machinery had been tested, the purchasers expressed admiration for

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Shelburne Museum, Shelburne, Vt. A scale model, about three feet long including tender, is among the collections of the Smithsonian Institution.

<sup>6</sup> Baldwin Locomotive Works, Register of Engines, I (1833-1871), 1. These eleven manuscript volumes (1833-1904) containing names, companies, construction numbers, and dates of delivery are in the custody of the Transportation Division of the Smithsonian. A convenient listing of the first 100 locomotives built by Baldwin has been appended to R. H. Sanford, "A Pioneer Locomotive Builder," *Railway and Locomotive Historical Society Bulletin* No. 8 (R&LHSB) (1924), 20-23.

<sup>7</sup> Baldwin to Corning, Feb. 2, 1836, in Baldwin Letter Copy Book, 1836-1837, Historical Society of Pennsylvania (HSP). All letters written by Baldwin in 1836 or 1837, and cited hereafter only by date, are found in this book. Cf. Register of Engines, I, 1; and *Memorial*, 55-56. The shops at Broad and Hamilton Sts. survived financial panics and disastrous fires until they covered 19 acres in the heart of the city. Beginning in 1906, the facilities were moved to a plot of 590 acres at Eddystone, which eventually contained 90 buildings with 108 acres of floor space. On June 28, 1928, the old offices and works in Philadelphia were abandoned. *The Story of Eddystone* (Philadelphia, 1928), 9-11, 75.

<sup>8</sup> Baldwin to Gideon Hawley, Mar. 9, 1836.

<sup>9</sup> *Journal of the Common Council of the City of Philadelphia for 1836-1837* (Philadelphia, 1837), 64; Minutes of the Trustees of the Philadelphia Ice Boat, 1837-1838, excerpts by George H. Eckhardt, June 26, 1925, in Baldwin Locomotive Works Specification Book, 1838-1843, 3, HSP; Trustees of the Ice Boat, *Journal*, 1837-1877, 1-12, *passim*, Department of Records, Archives Division, Philadelphia. The original contract for \$32,000 was paid in full. Baldwin received \$1,221.03 for additional work, but there is no indication in the *Journal* that this was drawn on account of a supplementary contract for \$4,000 which Eckhardt cites from the Minute Book, now lost. This implies that the second contract of June 29, 1837, was cancelled.

its "neatness, strength and disposition."<sup>10</sup> Their judgment was well founded. Thirty years later, the engines had outlasted the boat, and with very little repair were installed in another.<sup>11</sup>

During Baldwin's first decade as a locomotive builder, one half of his total production for that period came in 1836 and 1837. Fourteen engines had emerged from the shops in 1835. Then the number leaped to forty locomotives during each of the next two years. By September, 1839, the Works had constructed 140 engines for thirty-nine railroads. More than one third of this output, however, had been taken by only three lines: twenty-seven by the Philadelphia & Columbia Railroad; twelve by the Utica & Schenectady; and twelve by the Georgia Railroad & Banking Company.<sup>12</sup> In December, 1838, when Baldwin's total had reached 122, Secretary of the Treasury Levi Woodbury reported that there were about 350 steam locomotives in the United States.<sup>13</sup> Approximately twenty-three shops were engaged in their manufacture.<sup>14</sup> With new facilities covering four blocks on a frontage of 1,125 feet, the Baldwin Locomotive Works was the largest. Since at least seventy-eight engines are known to have been imported from England by this time, Baldwin was responsible for almost forty-five per cent of the domestic production. Clearly, the energetic machinist was trying to satisfy what some disparagingly called "the railroad mania."<sup>15</sup>

<sup>10</sup> Ice Boat Minutes, Jan. 23, 1838 (Eckhardt citations), Baldwin Specification Book, 1838-1843, 3.

<sup>11</sup> Ice Boat Journal, 1837-1877, 163-164; *Memorial*, 56. In 1866, when a new iron ice boat was authorized, repairs to the machinery cost \$560.82, and new pumps with hose amounted to \$1,091.60.

<sup>12</sup> *History of the Baldwin Locomotive Works, 1831 to 1907* (Philadelphia, 1907), 22, hereinafter *Baldwin History*; Michel Chevalier, *Histoire et description des voies de communication aux États-Unis et des travaux d'art qui en dépendent* (Paris, 1840-1841), I, 381. The Indianapolis, assigned No. 134 and delivered to the Madison & Indianapolis Railroad on Sept. 3, 1839, was actually engine No. 140, six having been given numbers out of sequence. Register of Engines, I, 5; *Locomotive Engine Catalog of Baldwin, Vail and Hufty, Philadelphia, 1840*, facsimile edited by Railroad Research Associates (Oakland, Calif., 1946), 1.

<sup>13</sup> U. S. Treasury Department, *Steam Engines: Letter from the Secretary of the Treasury transmitting . . . information in relation to Steam Engines, &c.*, Dec. 13, 1838, 25th Cong., 3d Sess., House Ex. Doc. 21 (Washington, 1839), 9, 378.

<sup>14</sup> [Charles E. Fisher], "An Early List of Locomotives," *R&LHSB No. 6* (1923), 22-23. Of the twenty-seven American shops in this compilation, four are obvious duplications.

<sup>15</sup> Franz Anton von Gerstner, *Die innern Communicationen der Vereinigten Staaten von Nordamerika* (Vienna, 1842-1843), II, 163; Joseph Harrison, Jr., "The Locomotive Engine, and

The cascade of orders which nearly overwhelmed the factory at the beginning of 1836 assured Baldwin that there would be plenty of work for the coming year.<sup>16</sup> On behalf of the Philadelphia & Columbia Railroad, a vital part of Pennsylvania's hybrid system of canals and railroads, Baldwin attempted to persuade a private company to release an engine he was then building in order to aid the Canal Commissioners who managed the state road.<sup>17</sup> Apparently he had little success, the *Ohio* being his only locomotive delivered to that line during 1836. However, contracts with the Pennsylvania government took more than one third of the factory's heavy production in 1837, and helped to secure the Philadelphia & Columbia's position as the owner of more locomotives than any other railroad in the Union.<sup>18</sup>

The demand for motive power on the host of lines springing up throughout the country is reflected by the record of prices charged for Baldwin's machines. His third engine, the *Lancaster*, represented considerable technological advance over *Old Ironsides*, and its price of \$5,850 was nearly a fifty per cent increase. From late 1834 until early 1836, the figure ranged between \$6,317 and \$6,400.<sup>19</sup> At the end of this interval, there were some difficulties with the workmen regarding wages. On March 8, Baldwin was quoting a price of \$6,700; on March 12, there was a meeting of his employees "whose object was to have a turnout." Baldwin seemed confident that the matter would "blow over without any violent measures being addopted" [*sic*]. By the twenty-fourth, he was informing a buyer that "oweing to

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Philadelphia's Share in its Early Improvements," *Journal of the Franklin Institute (JFI)*, LXIII (1872), 239. Harrison was a locomotive manufacturer associated with Andrew M. Eastwick during the 1830's and 1840's. See John H. Frederick, "Joseph Harrison," *DAB*, VIII, 345-346. The engine list in *R&LHSB No. 6*, 23-33, is based on the Woodbury Report.

<sup>16</sup> Cf. Baldwin to Daniel Parker & Sons, Jan. 7, 1836, to F. Whittle, Jan. 14, 1836, and to C. F. Limpet, Apr. 16, 1836.

<sup>17</sup> Baldwin to L. A. Sykes, Feb. 15, 1836, to George Schuyler, Mar. 12, 1836.

<sup>18</sup> *R&LHSB No. 8*, 20-23; von Gerstner, II, 137; Jonathan Knight, *Report upon the Locomotive Engines and the Police and Management of several of the Principal Rail Roads in the Northern and Middle States* (Baltimore, 1838), 28-31, facsimile as *R&LHSB No. 13* (1927). For a charming memoir of the Philadelphia & Columbia and the Allegheny Portage Railroads connecting the eastern and western division canals of the state works, see Eugene S. Ferguson, ed., *Early Engineering Reminiscences (1815-40) of George Escol Sellers* (U. S. National Museum Bulletin 238, Washington, 1965), 145, 147-159.

<sup>19</sup> *R&LHSB No. 8*, 20-21; von Gerstner, II, 138.

the rise of wages with my workmen and the still increasing price of materials and not knowing when it may stop or where it will end, I am induced to ask \$7,000 for my machines."<sup>20</sup> Having recognized the value of their skills, Baldwin's 240 mechanics and artisans had exerted their leverage;<sup>21</sup> with the growing demand for locomotives, their employer could well afford to pass additional labor costs on to the railroads.<sup>22</sup>

Until February, 1837, Baldwin was usually able to stabilize his price at \$7,000, although iron, which he had formerly obtained at \$160 per ton, had now climbed to \$240, and other materials had risen in about the same proportion.<sup>23</sup> Of the fourteen locomotives built for the state road during 1837, the first three each cost \$7,000. The remaining eleven delivered after February 18 were priced at \$7,500. In spite of all that had happened to the economy and to the banking situation in the meantime, the Philadelphia & Columbia continued to pay \$7,500 apiece for two additional engines furnished in April, 1839.<sup>24</sup> By then, the procrastination of debtors, both public and private, had become widespread. Building an engine under contract was one matter; extracting payment upon delivery was another.<sup>25</sup>

The shortage of capital in American manufacturing is illustrated by a misunderstanding that occurred between Baldwin and Erastus Corning, president of the Utica & Schenectady Railroad. Customarily, Baldwin received one-half payment when the boiler was finished and ready to have the cylinders installed; the balance was due when the engine was completed at the factory.<sup>26</sup> Near the end of

<sup>20</sup> Baldwin to Walter Guynn, Mar. 8, 1836, to George Schuyler, Mar. 12, 1836, to Wm. W. Woolsey, Mar. 24, 1836.

<sup>21</sup> Baldwin to C. F. Limpet, Apr. 16, 1836.

<sup>22</sup> *Ibid.*, Baldwin to F. Whittley, Jan. 14, 1836.

<sup>23</sup> Baldwin to G. C. Logan, Jan. 5, 1837, to Joseph Johnson, Feb. 17, 1837.

<sup>24</sup> *RELSHB No. 8*, 20-23; von Gerstner, II, 138.

<sup>25</sup> Baldwin to Hendricks and Brother, Feb. 21, 1839; Baldwin, Vail & Hufty to James Cameron, State Canal Commissioner, Aug. 31, 1839; George Hufty to [Stephen Vail], Dec. 30, 1839, all in Baldwin Letter Copy Book, Feb. 21, 1839—Feb. 15, 1841, HSP. Letters in this period written by Baldwin, by George W. Hufty, or over the firm name of Baldwin, Vail & Hufty, and cited hereinafter simply by date, are found in this book.

<sup>26</sup> Baldwin to Walter Guynn, Mar. 8, 1836.

1835, Corning had placed his first order for six engines. Evidently he had never expected to make any payment until the locomotives were finished and delivered. With work halfway completed on four engines, Baldwin asked Corning if he would accept a draft for \$6,000.<sup>27</sup> The railroad president called for substantial assurance that the locomotive manufacturer was entirely trustworthy. Baldwin presented a reference, but added pointedly: "As to giving security such as judgment on my property or any thing like that, it is entirely out of the question. I would much sooner give up the contract altogether."<sup>28</sup> As a compromise, Baldwin pledged the first three engines—by then nearly finished—as security on the delivery of the second three.<sup>29</sup> Since nothing more can be found concerning this incident, it may be assumed that Corning accepted Baldwin's two drafts totalling \$12,000 which were presented sometime between the fifth and the ninth of March.<sup>30</sup> Late in February, Baldwin had confessed to another correspondent that, with payment of notes due presently, he was in "great straights," being \$12,000 short.<sup>31</sup> Corning must have been thoroughly satisfied with his machines because orders for another six were completed by the autumn of 1837. For several years the twelve locomotives in service on the Utica & Schenectady were easily the largest number on any line in New York state, and all were Baldwin products.<sup>32</sup>

The early days at the Works were filled with common irritations provoked by expensive materials and dilatory suppliers. Throughout 1836, Baldwin made frequent requests for various quantities of copper. To Edgar L. Miller, his agent in New York City, he asked that enough for twelve steam domes be secured at local prices.<sup>33</sup> Possibly the shortage or high cost in Philadelphia resulted from inadequate rolling facilities. Before the erection of the Broad Street

<sup>27</sup> Baldwin to Corning, Feb. 2, 1836.

<sup>28</sup> *Ibid.*, Feb. 22, 1836.

<sup>29</sup> Baldwin to Gideon Hawley, Mar. 1, 1836.

<sup>30</sup> *Ibid.*, Mar. 9, 1836.

<sup>31</sup> Baldwin to E. Whitaker, Feb. 25, 1836.

<sup>32</sup> *REGLHSB No. 8*, 20-23; von Gerstner, I, 120-121, 238. For Corning's busy career, see Irene D. Neu, *Erastus Corning, Merchant and Financier, 1794-1872* (Ithaca, 1960).

<sup>33</sup> Baldwin to E. L. Miller, Apr. 12, 1836, to Hendricks and Brothers, Nov. 2, 1836.

plant, for instance, Baldwin had to obtain his locomotive boilers from Moses Starr, the only manufacturer in the city prepared for that work.<sup>34</sup> One of his most important suppliers was the Speedwell Iron Works, a New Jersey foundry owned by Stephen and George Vail. From 1836 to 1842, Baldwin depended upon the Vails for crank axles and wrought-iron tires. The vicissitudes in their business relations can be followed with amusement in Baldwin's letters. On April 19, 1836, he hoped that crank production might be sufficient to enable him to turn out three engines a month. On October 29, he expressed satisfaction regarding the punctual delivery of these vital parts. By January 10, 1837, he was complaining that promises had been substituted for results: "I tell you what," exclaimed Baldwin with exasperation, "I would like to make you acquainted with one fact, 'that is' talking is one thing and *doing* is another." After much exhortation, the Master of the Works grumbled that he would "Kick hard against the Ten Dollars" that had been added to the large cranks.<sup>35</sup> As late as 1841, the frequency of Baldwin's protests indicates that promptness was not the cardinal virtue of the Speedwell foundry.<sup>36</sup> Baldwin was also concerned about the injury that breakage inflicted on his reputation, and sent drawings for improving the design of the cranks.<sup>37</sup> Obviously George Vail had been premature when he casually announced in 1839 that "By the by we have got now the mode of making cranks and will beat all who even thought of it."<sup>38</sup>

The manufacture and delivery of the wrought-iron tires also created vexations. Baldwin had induced S. Vail & Son to supply him, but the problems which they encountered nearly caused them to

<sup>34</sup> Ferguson, 164, 165.

<sup>35</sup> Baldwin to S. Vail & Son, Apr. 19, Oct. 29, 1836, and Jan. 10, 1837.

<sup>36</sup> Baldwin to Stephen Vail, Aug. 20, 1841; Baldwin & Vail to Stephen Vail, Nov. 18, 1841; Baldwin to S. Vail, Nov. 26, 1841, all in Baldwin Letter Copy Book, Feb. 19, 1841—Dec. 30, 1844, HSP. Letters in this third book, as in the earlier two, will be cited hereinafter simply by date.

<sup>37</sup> Baldwin, Vail & Hufty to Stephen Vail, Apr. 10, 1841.

<sup>38</sup> George Vail to Alfred Vail, Dec. 18, 1839, in Alfred Vail Letter Book, Private Correspondence, 1836-1848, Alfred Vail Mss, Archives of the Smithsonian Institution (ASI). Unless otherwise indicated, all letters between George and Alfred Vail are found in this book and will be cited hereinafter merely by date and repository (ASI).



abandon the task.<sup>39</sup> Cheered by Baldwin, they persevered. The great difficulty lay in making them of uniform diameter and of twice the usual thickness, yet "warranted not to open in the weld."<sup>40</sup> In one shipment, Baldwin noted that several were not only poorly welded but also much thinner than desirable.<sup>41</sup> Furthermore, George Vail was informed by his brother Alfred, who was then working at the Baldwin plant, that a recent lot of fifty-four inch tires had actually been fifty-five and one-quarter inches. Alfred cautioned that the extra thickness should not make the outside diameter more than prescribed. The driving-wheels had to be made to close tolerances if they were not to interfere with adjacent parts.<sup>42</sup> About 1838, when Baldwin decided to import a few tires, the English manufacturers objected to the unusual thickness but finally agreed to meet his specifications.<sup>43</sup> Regarding the frequent breaks in the weld, George Vail observed that Baldwin was the sole patron who complained, yet he was receiving only one eighth of Speedwell's production. Since he and his father were constantly charging the workmen to be careful, George believed that if Baldwin would watch the draft given in stretching the tires, he would find the true cause of the failures.<sup>44</sup> All of these difficulties intensified the search for a durable crank and a superior wheel. By March, 1839, Baldwin was already building a few engines with outside cylinder connections and casting a truck wheel of promising hardness.<sup>45</sup>

Long before the ruinous depression of the late 1830's, stringent finances had forced Baldwin to prod even his small debtors and occasionally to refuse to cash bills for his patrons.<sup>46</sup> When he began work on the large order of locomotives to be completed for the state road during 1837, he found himself without funds. Resorting to the banks,

<sup>39</sup> Baldwin to S. Vail & Son, Aug. 3, 1836.

<sup>40</sup> Advertisement in *ARRJ*, X (Jan. 1, 1840 *et seq.*).

<sup>41</sup> Baldwin to S. Vail, Mar. 28, 1840.

<sup>42</sup> Alfred Vail for Baldwin, Vail & Hufty to George Vail, Apr. 6, 1840, in Baldwin Letter Copy Book, 1839-1841, HSP.

<sup>43</sup> *Baldwin History*, 25.

<sup>44</sup> George Vail to Alfred Vail, Aug. 24, 1840, ASI.

<sup>45</sup> *Baldwin History*, 25. Tires were delivered no faster than cranks. Baldwin to S. Vail & Son, Mar. 13, 1839; Baldwin, Vail & Hufty to S. Vail, Sept. 1, 1839.

<sup>46</sup> Baldwin to David Deshla, Mar. 10, 1836, to Hendricks and Brothers, Nov. 2, 1836.

he reminded a state official that the legislature had failed to make any appropriation and urgently requested that a bill be prepared relieving him from his embarrassment.<sup>47</sup> He also warned a buyer that he should remit a check on one of the Philadelphia banks because of the exorbitant rate which they were then charging to collect in other places.<sup>48</sup> In the pinching times ahead, the state and private company alike would find themselves continually distressed.<sup>49</sup>

Although the Panic of 1837 was merely one phase of an international economic collapse, it was hastened by widespread speculation in land, industry, canals, and railroads. When the London stock exchange unloaded American securities, much of the fragile structure came tumbling down.<sup>50</sup> After the banks of Philadelphia suspended specie payments on the eleventh of May, wholesale bankruptcies ensued.<sup>51</sup> In the general upheaval, Baldwin felt helpless as orders were cancelled and payments were stopped. Unable to collect, he summoned his creditors for a settlement. After offering to surrender every vestige of his property, the sale of which might satisfy only about one fourth of their claims, he proposed that they should permit him to continue with the business and in three years he would repay both principal and interest.<sup>52</sup> No doubt their consent was the result of pragmatic calculation. With at least seventy-eight or seventy-nine locomotives now running on American railroads, Baldwin was gaining an enviable reputation for their reliability.<sup>53</sup> It was fortunate that most of his creditors were patient, for it was not three years but nearer to six or seven before their confidence was ultimately vindicated.<sup>54</sup>

In spite of the serious crisis of 1837, orders in hand enabled the Works to produce as many engines as in the previous year. Yet for nearly a decade, the annual number never exceeded the forty locomo-

<sup>47</sup> Baldwin to W. B. Fling, Feb. 8, 1837.

<sup>48</sup> Baldwin to Joseph Johnson, Feb. 17, 1837.

<sup>49</sup> Baldwin, Vail & Hufty to James Cameron, Aug. 31, 1839; George Hufty to [Stephen Vail], Dec. 30, 1839; Baldwin to Stephen Vail, June 17, 1840.

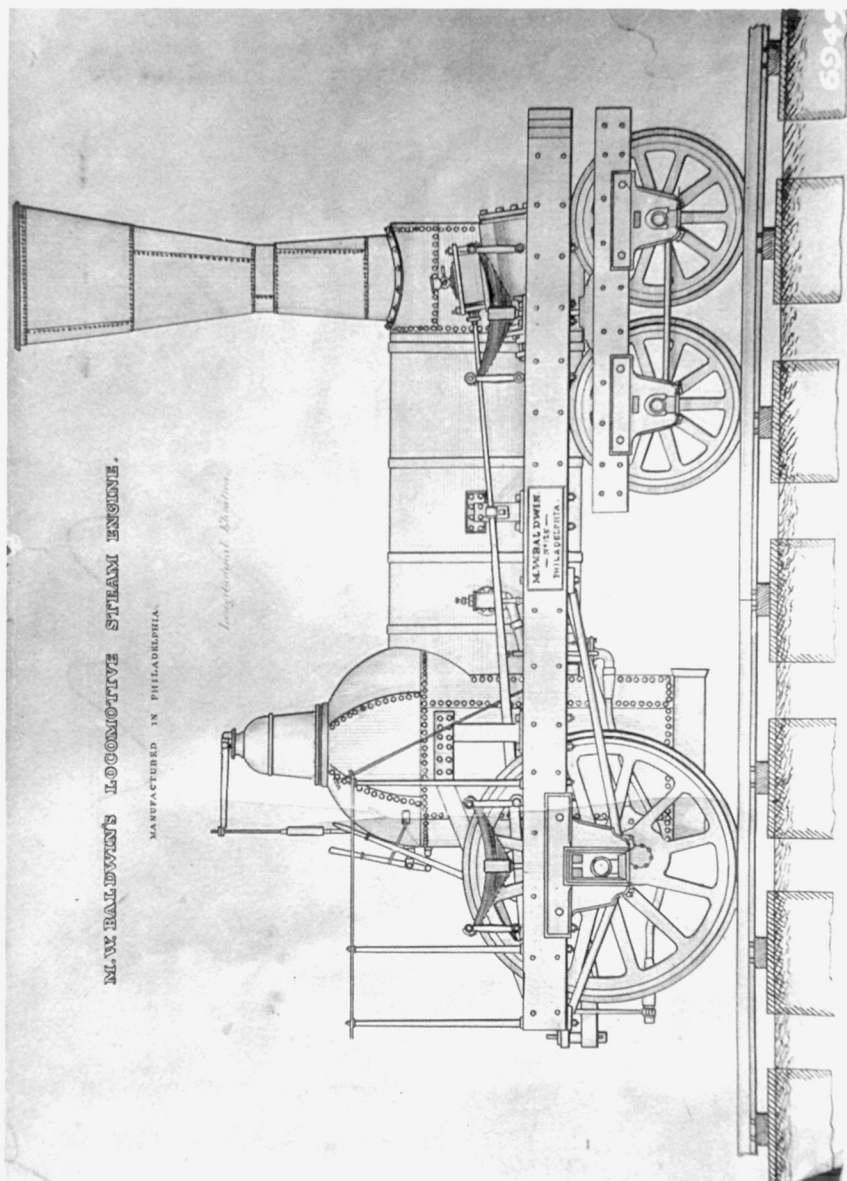
<sup>50</sup> Bray Hammond, *Banks and Politics in America from the Revolution to the Civil War* (Princeton, 1957), 457-467; Reginald C. McGrane, *The Panic of 1837: Some Financial Problems of the Jacksonian Era* (Chicago, 1924), 40-42, 92-93.

<sup>51</sup> *Public Ledger*, May 11, 12, 1837.

<sup>52</sup> *Memorial*, 75-76; *Baldwin History*, 24.

<sup>53</sup> *R&LSHB No. 8*, 22-23; Knight, 28; *ARRJ*, III (Apr. 12, 1834), 209; VII (Aug. 15, 1838), 135-136.

<sup>54</sup> *Memorial*, 76; *Baldwin History*, 24.



Courtesy of the Smithsonian Institution

### THE BALDWIN LOCOMOTIVE, 1834 TO c. 1840

Although this is No. 125, the *Martin Van Buren*, built in 1839, it is representative of at least the first 134 engines after *Old Ironsides*



Courtesy of the Library of Congress

MATTHIAS W. BALDWIN

Engraved by John Sartain for Wolcott Calkins' *Memorial of Matthias W. Baldwin*  
(Philadelphia, 1867)

tives built in each of these busy years. The declining demand resulted in an output of only twenty-three machines in 1838, twenty-six in 1839, and nine each in 1840 and 1841.<sup>55</sup> Paradoxically, as the domestic market temporarily shrank, a foreign trade of great potential modestly began. The first locomotives for export, *Colon* and *Cervantes*, had been commissioned by Alfred Cruger and were shipped to Cuba in April and June, 1838. Fifteen months later, a report that unsolicited orders for Baldwin engines had been received from England caused a nationalistic outburst from the *American Railroad Journal*.<sup>56</sup> The report was erroneous; not until the summer of 1840 was another engine for export nearing completion. Ordered by August Belmont as agent for the Rothschilds, it was a heavy freight locomotive intended for Emperor Ferdinand's north road from Vienna to Lemberg.<sup>57</sup> Until it was thoroughly tested, one of Baldwin's partners at this time regretted that the engine was being spoken of as a "monster for business." Hounded by the depression, he was afraid that a failure would be trumpeted by their enemies and might result in disaster for the firm.<sup>58</sup>

The financial panic and the long depression naturally took their human toll. As production was curtailed, the laboring force was reduced. Since methodical records on this reduction do not survive and may never have been kept, random comments in Baldwin's letters furnish the exclusive source of information about it. In May, 1837, the factory had about 300 employees, probably the largest number at any time during the decade. This figure represented a twenty-five per cent increase over the total employed thirteen months before.<sup>59</sup> With the average annual output during the years 1838-1841 at less than forty-three per cent of what it had been in 1836 or 1837,<sup>60</sup> it seems reasonable to estimate an average reduction in workmen for this period at about one third. Rather than using

<sup>55</sup> Register of Engines, I, 2-6; *Baldwin History*, 22, 24. For a convenient table giving full production statistics from 1831 to 1907, consult Charles E. Ronaldson *et al.*, "The Development of the American Locomotive," *JFI*, CLXIV (1907), 266.

<sup>56</sup> Register of Engines, I, 3; *R&LHSB No. 8*, 12; *ARRJ*, IX (Sept. 1, 1839), 132.

<sup>57</sup> Baldwin, Vail & Hufty to James Cameron, July 29, 1840; *ARRJ*, XI (Sept. 15, 1840), 188-189, reprinted from the *Public Ledger*.

<sup>58</sup> George Vail to Alfred Vail, July 30, 1840, ASI.

<sup>59</sup> *Baldwin History*, 24; Baldwin to C. F. Limpet, Apr. 16, 1836.

<sup>60</sup> Seventeen engines as compared to forty.

scrip to meet his reduced payroll, Baldwin made arrangements with dealers in fuel and provisions to receive small orders from his office and to take his note for the total amount. In like manner, his employees accepted his pledge of future payment and allowed their wages to accumulate. A few, perhaps, attempted to convert his notes. One worker took all of his accrued earnings—four hundred dollars—and, after having Baldwin's note discounted, invested in a land speculation. As luck would have it, he lost every cent, and was later mortified to see the paper redeemed with full interest.<sup>61</sup>

From almost the beginning of his venture in manufacturing locomotives, Baldwin had relied upon the Speedwell Iron Works for crank axles and wrought-iron tires. This pioneering foundry of Morristown, New Jersey, was the product of the indomitable energy of Judge Stephen Vail. From 1839 until 1842, this remarkable man and his two sons were intimately connected with the Baldwin Locomotive Works. Having made the first cast iron plow and the boiler for the first steamship to cross the Atlantic, the Judge was soon filling the needs of the Railroad Age. In 1837, he also provided facilities for the experiments in telegraphy then being conducted by his elder son, Alfred, in association with Samuel F. B. Morse.<sup>62</sup> Comments by George Vail, his partner and younger son, suggest that the character of the Judge was similar to the material of his trade. At the age of sixty, he once threatened to retire.<sup>63</sup> It was an idle gesture. A man of his temperament is rarely satisfied unless he is constantly at the helm. About a decade later, he finally did turn over the active management to George, but it is unlikely that anything important escaped his notice.<sup>64</sup> The Judge's dominant personality found enduring expression in his will: the Speedwell Works could never be sold and could be operated only by certain, specified persons.<sup>65</sup> After the

<sup>61</sup> *Memorial*, 78-79.

<sup>62</sup> Edmund D. Halsey *et al.*, *History of Morris County, New Jersey* . . . (New York, 1882), 160-162; Charles S. Boyer, *Early Forges and Furnaces in New Jersey* (Philadelphia, 1931), 208-210. As one of the lay officers on the local bench, Stephen Vail acquired the title of Judge. *Appleton's Cyclopedia of American Biography* (New York, 1887-1889), VI, 220. For a list of the products made at Speedwell, see the advertisement of "S. VAIL" in *ARRJ*, X (Jan. 1, 1840, *et seq.*).

<sup>63</sup> George Vail to Alfred Vail, June 1, 1840, ASI.

<sup>64</sup> Henry C. Pitney, Jr., ed., *A History of Morris County, New Jersey* . . . 1710-1913 (New York, 1914), 31-32; Halsey, 175.

<sup>65</sup> Pitney, 31-32. A printed copy of Stephen Vail's will is in the Morristown Public Library.

patriarch died in 1864, the shops and foundry were soon closed and fell gradually into decay.

As the depression wore on, the need for more capital became acute, although in February, 1839, the engine builder was able to report that since the previous autumn his liabilities had been reduced by about \$30,000.<sup>66</sup> Then came an incident which emphasized his plight. The failure of the Bank of Michigan made it impossible to accept Michigan state paper in payment for a locomotive he had contracted to build a few months before. Consequently, he refused to deliver the engine "without an assurance of getting a draft on the East at sight," or something equivalent in value to the state bank notes when the bargain had been made.<sup>67</sup> At this point, temporary relief was imminent. Since the prosperity of the Morristown foundry and the Philadelphia factory tended to be reciprocal, their proprietors began to consider a closer association. Baldwin probably made the first move. Early in April, 1839, he and George W. Hufty, one of his machinists, spent four days at Speedwell where the matter was thoroughly discussed.<sup>68</sup> One week later, George and Stephen Vail returned the visit at the Baldwin plant. The son was evidently impressed, but the father, full of years and scars in the business world, tried to discourage him from what seemed a risky investment. The younger man would not be dissuaded.<sup>69</sup> Accordingly, on May 14, 1839, he became an associate in the firm of Baldwin, Vail & Hufty. Complete figures on the monetary consideration are not available, but the first installment which the Judge advanced for his son was \$8,000. Undoubtedly, this represented a portion of George's share from the liquidation of his interest in the family enterprise.<sup>70</sup> The total investment by the Vails may be estimated conservatively at \$20,000, a princely sum in those distressing times.

For a number of months after he had joined Baldwin and Hufty, George Vail appears to have made many visits to Philadelphia to confer with his partners. Toward the close of 1839, when Alfred

<sup>66</sup> Baldwin to Hendricks and Brother, Feb. 21, 1839.

<sup>67</sup> Baldwin to Benjamin Briscoe, Mar. 21, 1839.

<sup>68</sup> Journal Book of Stephen Vail, entries for Apr. 3, 4, 5, 1839. These fifteen manuscript volumes (1825-1864) are temporarily in the custody of the Morristown National Historical Park, Morristown, N. J., from the estate of the late John H. Lidgerwood.

<sup>69</sup> *Ibid.*, Apr. 11, 12, 25, 1839.

<sup>70</sup> *Ibid.*, May 14, 15, 16, 29, June 1, 11, 1839; also Baldwin to Wm. C. Young, May 6, 1839.

Vail became agent-in-residence for the family interests, the trips occurred less frequently.<sup>71</sup> Baldwin may have felt that George could render the best service by remaining at Speedwell to supervise the production of tires and crank axles; moreover, he may not have desired the suggestions which his young associate now felt entitled to make. Although the Vails had saved Baldwin from bankruptcy, the partnership soon revealed tensions. Had all members been in daily contact, their antagonism might quickly have destroyed the new arrangement.

During the spring of 1840, conditions at Speedwell also deteriorated. According to George, the Judge's disposition had seemed to alter more in the last year than in the previous ten. The "old buck" had grown suspicious and was prying into his son's mail. His obsession for work, thought George, could not be explained by a fear of poverty but by a growing acquisitiveness.<sup>72</sup> The man was applying himself to his property "day & night Sunday and all. . . . like a slave in the mines of Mexico he is condemned to dig, dig, dig, untill his sentence is revoked or his mind relieved by . . . other objects."<sup>73</sup> Besides his involvement in Whig politics, the Judge had recently become a director of a New Jersey railroad.<sup>74</sup> Observing that there were a hundred other things which had to be done, George complained that two-thirds of his father's time was consumed by "that streak of iron with a crab running on it." Then he added somberly: "Things move here in one continued *train* or rather *strain*—everything bends beneath the weight of obedience to & respect for the leader—Times tight and prophecies of their being tighter still are flowing around in regular succession." Not until the end of September did he sound a more cheerful note.<sup>75</sup>

To the personal irritations and business dissensions among the partners, annoying political differences were now added. In June, 1840, Baldwin indicated that his sentiments were decidedly for the Whigs. Realizing that the Judge was inclined toward "the good

<sup>71</sup> In his Journal, the Judge was always careful to note the movements of his sons and business associates. Alfred remained in Philadelphia until 1843. Carl W. Mitman, "Alfred Vail," *DAB*, XIX, 136-137.

<sup>72</sup> George Vail to Alfred Vail, Apr. 25, 1840, ASI.

<sup>73</sup> *Ibid.*, May 8, 1840.

<sup>74</sup> *Ibid.*, Apr. 6, May 8, 1840.

<sup>75</sup> *Ibid.*, June 1, Sept. 28, 1840.



cause," he sent a partisan tract with an offer to supply an additional quantity.<sup>76</sup> "Stand for Harrison," urged Baldwin; "if you dont you will be left all alone. . . ."<sup>77</sup> The admonition was hardly necessary. As early as April, the ironmaster had been thumping the tub on behalf of Whig candidates. For George this was most disgusting. To Alfred he announced that "You must not be surprised to hear 'Our Father' talk 'Log Cabin.' he has more than  $\frac{1}{2}$  gone over to the enemy." The hard cider, vulgar conviviality, and pompous demagoguery were entirely too much: "For my part," he confessed, "I have absolved myself from politicks and resolved to be a decent man."<sup>78</sup> He was also darkly suspicious of the United States Bank, warning that if this institution were to handle an impending transaction "do look out for snakes." Rumors of its imminent demise only furnished him with another reason why Harrison ought to be defeated.<sup>79</sup> As to the Judge's candidacy for a seat in the state legislature, the son was entirely reconciled to his father's expected defeat. After all, he asked, how could such a restless, vigorous man endure all of the sitting and the talking which went with that office?<sup>80</sup>

The routine business of Baldwin, Vail & Hufty was devoted largely to a ceaseless quest for cash. Loans had to be arranged, deadlines met, materials purchased, workmen paid, creditors allayed, and debtors prodded. The sums involved varied from a few hundred dollars to several thousand, and occasionally much more.<sup>81</sup> Throughout 1841, for example, Baldwin had particular difficulty in collecting for engines he had built for Benjamin H. Wright. The total remittance, amounting perhaps to \$14,000, had been expected in January. Three months later, there were explanations but still no money.<sup>82</sup> During the summer, however, the drafts began to trickle in.<sup>83</sup> By September 25, \$3,500 had been received, and Baldwin was informing

<sup>76</sup> Baldwin, Vail & Hufty to Stephen Vail, June 13, 1840.

<sup>77</sup> Baldwin to Stephen Vail, June 17, 1840.

<sup>78</sup> George Vail to Alfred Vail, Apr. 6, 1840, ASI.

<sup>79</sup> *Ibid.*, July 30, 1840.

<sup>80</sup> *Ibid.*, Sept. 28, 1840.

<sup>81</sup> E.g., George Vail to Alfred Vail, Apr. 6, 1840, ASI; Baldwin, Vail & Hufty to Thomas Hunt, Apr. 6, 1840, to Geo. Vail, July 17, 1840; Baldwin to Stephen Vail, Apr. 2, 1841; Baldwin & Vail to Geo. Vail, Nov. 13, 1841, to A. G. Phelps, Nov. 26, 1841, to B. I. Leedom, Apr. 11, 1842.

<sup>82</sup> Baldwin, Vail & Hufty to B. H. Wright, May 4, 1841.

<sup>83</sup> Baldwin & Vail to B. H. Wright, Aug. 19, 1841; Baldwin to Stephen Vail, Aug. 20, 1841.

the Judge that a visit to Mr. Wright might yield more.<sup>84</sup> As late as November 26, he continued to plead for the balance: "Pray . . . send us some if not the whole."<sup>85</sup> Manipulation of these affairs required considerable dexterity. Sometimes the firm barely managed to escape disaster. More than once ominous handbills went up announcing the date of a sheriff's sale.<sup>86</sup> Always they came down before that dreadful hour.

One of the partners in the firm of Baldwin, Vail & Hufty retired in the summer of 1841. The reason for George W. Hufty's withdrawal is not recorded, but a new opportunity must have beckoned, possibly in New York. There is also a hint that he may have retained a part of his investment, liquidating only what he required for his new endeavor and transferring the rest to Baldwin & Vail as a loan.<sup>87</sup> Whatever his case, the relationship between his former partners continued its progressive decline. Even before the end of his first year in the business, George Vail had been ready to convey his interest to his brother Alfred whenever his colleagues were agreed.<sup>88</sup> Nearly fifteen months later, after his financial involvement had become much deeper, he would consent to the change only when his brother could profit by it. Bitterly he recited how his aid in 1839 had saved Baldwin from ruin. And what had he received for his trouble? Neither gratitude nor recognition. He had been exploited and shamelessly cast aside. Now he was sick of his partner and wanted as little to do with him as possible. Doubtless remembering that he had been cautioned against the venture, George implored his brother to "Show this not to Judge Vail nor anything of my letter to him. [I am] afraid to speak the truth even to my father as I think it."<sup>89</sup>

<sup>84</sup> Baldwin & Vail to Stephen Vail, Sept. 25, 1841, to B. H. Wright, Sept. 25, 1841.

<sup>85</sup> Baldwin & Vail to B. H. Wright, Nov. 26, 1841.

<sup>86</sup> *Memorial*, 105.

<sup>87</sup> Baldwin & Vail to Benjamin H. Wright, Aug. 19, 1841. The Judge later spoke of making an estimate of the firm's solvency, "M.W.B. in his individual Capassity & as partners of G. V. & Huftey [*sic*] . . ." *Journal of Stephen Vail*, June 30, 1842. George W. Hufty returned to Philadelphia in 1847 and continued to work as a machinist until he was elected City Controller, serving in that office from 1858 until his retirement in 1862. Thereafter, he regarded himself as a "gentleman." *A. M'Elroy's Philadelphia Directory*, 1839-1841, 1847-1864; Scharf and Wescott, III, 1756.

<sup>88</sup> George Vail to Alfred Vail, Apr. 25, 1840, ASI.

<sup>89</sup> *Ibid.*, July 9, 1841.

Watching daily affairs closely, Alfred was better informed and more optimistic. "There is no want of work," he wrote his brother, "but the thing is to get stock and pay hands." Keenly but tactfully, he questioned whether his brother and his father had made every effort to know precisely the condition of the firm, and to act effectively whenever occasion required. Having withdrawn so completely, George was at the mercy of rumor and did not realize the income of the business. "Now I would advise you," said Alfred, "if you wish to save your money in the end, and make much more besides, to concilliate with him (Mr. B) and rather take offense than give, and act with as much heart and interest in the Co. as ever."<sup>90</sup> This was wise and courageous advice—wise, because it recognized that once the depression had passed, the railroads would increase their demand for engines; courageous, because there was no certainty that the firm could survive to help fill that demand.

In moments of financial embarrassment, Baldwin never hesitated to call upon the Judge for relief.<sup>91</sup> As time passed, it seemed to George Vail that the cry for money had become the exclusive theme of all his partner's letters.<sup>92</sup> For both father and son, the needs of the Philadelphia concern must have appeared insatiable. Late in November, 1841, when the deadline was less than three weeks away on a note for \$3,000, Baldwin tried to reassure the Judge. He was certain that there would be enough cash to pay the obligation "at Maturity if not before." Furthermore, Baldwin did not feel that he merited the harsh remarks and threats which the elder Vail had made. It was obvious, he continued, that the concern had lost the Judge's confidence, but never had its chief officer been deceitful. He looked forward to that day when it might repay all, and, with classic restraint, he added: "It will afford me certainly as much pleasure as it can you."<sup>93</sup> Although there is no written evidence to confirm the incident, the elder Vail is said to have summoned the locomotive builder and proposed that the property be sold to him under fore-

<sup>90</sup> Alfred Vail to George Vail, Aug. 11, 1841, ASI.

<sup>91</sup> Baldwin to Stephen Vail, July 15, Aug. 28, Sept. 30, 1841.

<sup>92</sup> George Vail to Alfred Vail, Oct. 12, 1841, ASI.

<sup>93</sup> Baldwin to S. Vail, Nov. 26, 1841. See also Baldwin to George Vail, Nov. 5, 1841; Baldwin & Vail to S. Vail, Nov. 23, 1841; and Baldwin to George Vail, Nov. 29, 1841.

closure. Baldwin refused to be intimidated. With indignation, he declared: "You shall never have the slightest advantage over my smallest creditor on account of your connection with the firm!"<sup>94</sup> Probably nothing quite as melodramatic actually happened, but the "threats" made by the Judge, in letters long since destroyed, presumably included the warning of a forced sale.

By the spring of 1842, three years of financial bickering and temperamental disparity had brought George Vail to the limit of his endurance. He and his partner seemed increasingly at cross-purposes. Once when Baldwin was hiring more men to finish a contract, George complained that to pay more wages without getting more work indicated a grave inability to profit from experience.<sup>95</sup> There are times, however, when caution is a greater risk than audacity. If locomotives were not delivered promptly, as required, there were other shops which stood ready to seize what little business remained. Alfred Vail had been perfectly correct in telling his brother that by *actively* trying to save his investment, he could lose nothing but a few months of exertion.<sup>96</sup> Yet George Vail chose merely to lament the devious, "antichristian conduct" of his associate and to nurture his impression that Baldwin considered him more an enemy than an ally.<sup>97</sup> His frustration and resentment inevitably brought their partnership to an end. On June 30, Judge Vail estimated that the value of the company was "twenty odd thousand Dollars worse than Nothing allowing all they have at the highest prices wee can. . . ." Nevertheless, a bargain was struck, and on July 13, 1842, the firm of Baldwin & Vail was dissolved.<sup>98</sup> As part of the agreement, Baldwin engaged as his new associate Asa Whitney, who had been a canal commissioner and the superintendent of the Mohawk & Hudson Railroad.<sup>99</sup> While Baldwin & Whitney assumed all the debts of the former partnership, Judge Vail was afraid that recovering George's

<sup>94</sup> *Memorial*, 80-81. In deference to George Vail, who was Judge of the New Jersey Court of Errors and Appeals in 1867, the Rev. Mr. Calkins did not mention the late Stephen Vail by name, but simply referred to him as "a capitalist in New Jersey."

<sup>95</sup> George Vail to Alfred Vail, Sept. 28, 1841, ASI.

<sup>96</sup> Alfred Vail to George Vail, Aug. 11, 1841, ASI.

<sup>97</sup> George Vail to Alfred Vail, Sept. 16, 1841, ASI.

<sup>98</sup> Journal of Stephen Vail, June 30, July 12, 13, 1842.

<sup>99</sup> *Ibid.*, June 30, 1842; Baldwin to Ross Winans, Aug. 1, 1842; Baldwin & Whitney to B. I. Leedom, Aug. 1, 1842; *Baldwin History*, 35.

investment might take "some years to Effect."<sup>100</sup> With the exception of occasional routine business and the gradual repayment of the debt, little contact remained between the Morristown foundry and the Philadelphia factory.<sup>101</sup> George and Stephen Vail had saved an enterprise, but the cost in anxiety proved more than the younger man had expected.

The fortunes of the Baldwin Locomotive Works from 1831 to 1842 mirror quite vividly the hopes and disappointments of that turbulent era. The Panic of 1837 swept many business firms into ruin, and its reverberations almost carried Baldwin with them. In the first flush of optimism following Jackson's victory over the Bank, the removal of restraint accelerated the cycle of speculation and collapse. As a measure of Baldwin's movement with the tide, he enlarged his plant twice in the first three years and increased his labor force tenfold during the first five.<sup>102</sup> After the inevitable recoil, there was ample time to regret this hasty expansion. Only with generous aid from the Vails was he able to survive and to place his company on the secure foundation that eventually was to make him a wealthy man.<sup>103</sup>

How should the character of Matthias Baldwin be assessed? The *Memorial*, published shortly after his death, seems merely a eulogy in the conventional style. An image forms of the pious Christian, the industrial statesman, the enlightened philanthropist, precisely the combination of virtues extolled in nineteenth-century America. This desire to venerate the successful entrepreneur often found ridiculous expression in literary encomiums or architectural absurdities. Neither his early struggle nor his later triumph converted Baldwin to the bookkeeper's mentality; he remained primarily the artist, the craftsman, the inventor. His contemporaries sensed this. What Henry

<sup>100</sup> Journal of Stephen Vail, July 14, Aug. 17, 1842.

<sup>101</sup> Three letters came from Speedwell in the remaining months of that year: Aug. 10, 12, Oct. 21, 1842. Baldwin Mss., Incoming Letters, June–December, 1842, HSP.

<sup>102</sup> *Memorial*, 50, 55–56; *JFI*, CLXIV, 266. The factory had a capacity of 500 workmen and had cost over \$200,000. Baldwin & Whitney to Charles Moering, Aug. [18], 1842, in Baldwin Letter Copy Book, 1841–1844, 275.

<sup>103</sup> In 1864, Baldwin had an income of \$211,832, while his partner at that time, Matthew Baird, drew \$208,049. These were fabulous sums in a day of modest taxation and a striking indication of the profits to be gained in the business of locomotive construction. *The Rich Men of Philadelphia: Income Tax of the Residents of Philadelphia and Bucks County for the Year Ending April 30, 1865* (Philadelphia, 1865), 5.

Ford represented to a later age, Matthias Baldwin epitomized for his own. Both created the means to overcome the ancient limitations of time and space. Both rose to preëminence in keenly competitive fields, and each transformed the world of his generation. This tradition of "the contriving brain and the skillful hand" must be carried forward if we are to hold our place in an age of technology.<sup>104</sup>

As Baldwin wrestled to keep the firm in business, his mind was never far from the experiments that eventually resulted in a more powerful freight locomotive.<sup>105</sup> This was the kind of challenge he enjoyed. With monthly production of from one to three engines, he could certainly give personal supervision to the construction of each. We can imagine his proficient eye scanning a mechanism in search of any flaw in its function or finish. Despite the adoption of many standardized patterns, considerable work had to be done by hand. As each new locomotive rolled from the erecting room, the former jeweler must have taken pride in his ability to create a machine of beauty and utility. Before his death in 1866, the railroads were to purchase 1,500 engines which bore his name. For his persistence and skills, Baldwin reaped a generous reward as the founder of Philadelphia's famous enterprise.

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<sup>104</sup> The phrase is James C. Malin's.

<sup>105</sup> Baldwin, Vail & Hufty to A. Whitney, May 15, 1841; Baldwin & Vail to Edward Miller, Oct. 2, 1841; *Baldwin History*, 30-32.