

# The Mills of Liberty: Foreign Capital, Government Contracts, and the Establishment of DuPont, 1790–1820

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E. I. du Pont de Nemours & Co. is one of the world's largest chemical corporations, and its operations are of interest to business historians. This article explores the early history of the firm within the context of early republic political economy in order to show how it came to a place of prominence in the American gunpowder market by the early 1820s. The article utilizes the archival and printed records of DuPont, associated firms, government correspondence, and early War Department and trade statistics to show how the company, unlike other powder mills of that time, had access to both large reserves of foreign capital *and* the halls of power in the federal government. These resources helped DuPont become a principal supplier of gunpowder to the army, the navy, and a major exporter during the War of 1812 era.

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As one of the first modern industrial enterprises, the DuPont chemical company has long been an important case study for business

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historians, and particularly its rapport with the U.S. federal government.<sup>1</sup> With the exception of works on the company's early accounting practices and industrial espionage, the vast majority of scholarship thus focuses on the firm's mid-nineteenth and twentieth century history.<sup>2</sup> Located on the Brandywine Creek in northern Delaware, the Eleutherian Mills—or Mills of Liberty in the rough translation from Greek to French to English—played a significant role in the industrial development of the early United States. A study of DuPont's early years is important because it demonstrates the long-lasting nature of its relationship with federal military institutions. Works that do address E. I. du Pont de Nemours & Co.'s initial formation emphasize the same reasons that the DuPonts themselves sometimes claimed. Their factory would not “serve for war, but for the exercises that prevent war ... to the country's commerce, hunting, the opening up of mountains and canals to public works.”<sup>3</sup> Was this actually the case? Was the business, and its success, premised on a vast civilian market for gunpowder? The relative lack of studies on the early years of the firm brings these questions to a point: How exactly did DuPont become the preeminent gunpowder company in the early republic? The answer to that question can be found in the dual roles of foreign capital and government contracts. Substantial funds sourced from France, Switzerland, and Saint-Domingue allowed the company to obtain tools and relatively advanced manufacturing techniques from France's Gunpowder Administration. Access to the halls of power in Washington, DC, through family friend President Thomas Jefferson, allowed the firm to gain a favored position in the American

1. The members of the DuPont family rendered their last name in a variety of ways. In order to be as consistent as possible with each individual's original spelling, I have chosen to render the names as following: DuPont, when referring to the firm, E. I. du Pont de Nemours and Company; Du Pont, when referring to family patriarch Pierre Samuel Du Pont de Nemours; du Pont, when referring to either Eleuthère Irénée du Pont or Victor du Pont, or Du Pont when referring to more than one member of the family. In the notes, the variations of the spelling of the du Pont name are based on how it appears in the original source, and are likewise not errors. Chandler Jr., *Visible Hand*, 438–450; Chandler Jr., and Salsbury, *Pierre S. du Pont*, 4–13; Wilkinson, *Lammot Du Pont*, 290–292; Hounshell and Smith, *Science and Corporate Strategy*; Ndiaye, *Nylon and Bombs*; Frederickson, *Cold War Dixie*; Johnson, “Management Accounting,” 184–204; Hounshell, “Interpreting the History”; Wilson, “Gentlemanly Price;” Blaszczyk, “Styling Synthetics”; Blaszczyk, “Synthetics for the Shah”; Mullin, “DuPont and the Freon Ban”; Fujimura, “Old Du Pont Company's Accounting System”; Elzinga, “Predatory Pricing”; McNamee, “Du Pont–State Relations.”

2. Johnson, *Early Record Keeping in the Du Pont Company*; Hensley, “Brandywine Examples.”

3. P. S. du Pont de Nemours to Jefferson, December 17, 1801, in Boyd et al., *Papers of Thomas Jefferson*, 36:132; Dutton, *Du Pont*, 27; Cressy, *Saltpeteer*, 152–173.

market during the early 1800s vis-à-vis its ability to garner lucrative military contracts.

Well before the firm's latter history, the establishment of E. I. du Pont de Nemours & Co. sheds light on the nature of state–firm interactions in the early republic. In recent years there has been an engaging discussion on the theory and practice of political economy in this period, and specifically what role, if any, did the federal and state governments play in supporting economic development. One school of thought holds that advances in technology primarily drove industrial development. Networks of highly skilled machinists and inventors received indirect state support through a variety of means, such as patents, tariff protection, and a military interested in promoting technological advances.<sup>4</sup> The national armory system is a case in point. Skilled laborers frequently moved between the armories and private firms, taking knowledge of replaceable parts manufacture with them. The end result was an American “system of manufactures” that became the forerunner of modern mass production.<sup>5</sup> In a related argument, another group of scholars sees the emergence of industrialization as the result of a growing consensus in favor of liberal capitalism.<sup>6</sup> The opening up of foreign markets, limited tariff support, widespread banking, and favorable state legal regimes largely allowed the invisible hand of the market to guide the economy. Finally, a third thread in the historiography argues that economic development was primarily the result of state governments taking an active role in shaping the legal and institutional landscape. Even if the federal government did not always act to secure business interests for ideological and constitutional reasons, the states themselves did so through patronage and crony capitalism.<sup>7</sup> In their view, private interests were largely successful in capturing public administration for their own ends.

4. Meyer, *Networked Machinists*, 19–21; Thomson, *Structures of Change*, 20–22; Ben-Atar, *Trade Secrets*, xviii, 185–207; Martello, *Paul Revere's Ride*, 247–253.

5. Meyer, *Network Machinists*, 73–103; Smith, *Harpers Ferry Armory*, 219–251; Hounshell, *American System to Mass Production*, 32–46; Fagal, “American Arms Manufacturing.”

6. Appleby, *Capitalism and a New Social Order*, 100–105; Ha, *Rise and Fall of the American System*, 21–23; Shankman, *Crucible of American Democracy*, 223–234; Meyer, *Roots of American Industrialization*, 11; Wright, “Pivotal Role of Private Enterprise”; Dalzell Jr., *Enterprising Elite*, 26–36; Doerflinger, *Vigorous Spirit of Enterprise*, 342–344; Schakenbach, “Discontented Bostonians.” For the importance of finance and financial institutions for economic development in the early nineteenth century, see Bodenhorn, *Banking in Antebellum America*, 28–31; Wright, *One Nation Under Debt*, 269–284; Adams Jr., *Finance and Enterprise*, 3–6.

7. Sellers, *Market Revolution*, 54–55; Murphy, *Empire State*, 16; Schocket, *Founding Corporate Power*, 10–12; Peskin, *Manufacturing Revolution*, 181–187, 210–216; Larson, *Internal Improvement*, 195–224; Novak, *People's Welfare*, 83–113; Balogh, *Government Out of Sight*, 129–139.

The early history of DuPont suggests that elements of all three historical interpretations were at work, but more importantly demonstrates that the federal government played a central role in developing private military industry. The actions of the state to foster such firms were by no means incompatible with the prevailing of liberal capitalism of the nineteenth century. Within Adam Smith's anti-mercantilist philosophy was a substantial exception for manufacturers that pertained to national defense.<sup>8</sup> Relatively liberal economic policies in the early nineteenth century could be both hands-off for most economic sectors, while also embracing a modicum of state support for businesses essential for war. DuPont is just one notable example, and its history is instructive for parsing out a larger trend in the history of American state–firm relations. In forming their gunpowder company, the Du Pont family relied on a trans-Atlantic network to acquire capital and import advanced machinery, they secured favorable contracts for both their gunpowder and woolen ventures, and they benefitted from a national political economy that supported the arms and munitions industries.

DuPont and the federal government had a mutually beneficial relationship during the first two decades of the nineteenth century. For the administrations of the Virginia Dynasty (Jefferson through Monroe), the Mills of Liberty solved the problem of where to obtain an essential good for national defense. Instead of enduring the expense of setting up a state-run factory, as in the case of the armories, or relying on foreign imports, as during the Revolution, DuPont ensured that the federal government received a steady supply of gunpowder as long as the company was supported through periodic peacetime contracts. DuPont, for its part, clearly benefitted from its relationship with the federal government. War Department contracts for gunpowder (and later woolens) played an important role in providing steady revenues for the venture. A loosening of restrictions on gunpowder exports, modest tariffs, patent law, and the prestige of having the civilian market know that *it* was the principle supplier trusted by the government also aided the firm. Although a private firm, DuPont was essential to the American state and vice versa.

When the du Pont family left France for the United States in 1799, they did so with the intention of creating a vast fortune in their new home. The Coup of 18 Fructidor (September 1797) brought the Jacobins back to power and temporarily placed the family patriarch, Pierre S. Du Pont, in prison. Pierre and his sons, Victor and Eleuthère Irénée, were moderate royalists during the French Revolution, and the

8. Smith, *Wealth of Nations*, 492.

recent turn of affairs convinced them that they had a limited future in France.<sup>9</sup> Like the émigré of the early 1790s, the family had substantial wealth, which aided in their transition to the United States.<sup>10</sup> Unlike the émigré, they received permission from the ruling Directory to engage in foreign commerce, and could thus liquidate their holdings and transfer their capital out of the country. With passport in hand, the father convinced a number of his friends to become shareholders in the family firm Du Pont de Nemours Père, Fils et Compagnie.<sup>11</sup> At first, Pierre believed that his company should obtain and improve tramontane land, as numerous other European capitalists had done throughout the 1790s. However, the conditions of the American real estate market soon forced the family to change their plans. Upon hearing of his old friend's idea to invest in land, Thomas Jefferson warned Du Pont about the "swarms of speculators" and a resulting bubble that was sure to burst.<sup>12</sup> Du Pont heeded Jefferson's advice and soon warned his investors that they would be unable to make any money in a land venture. Instead, the family company would have to consider other prospects.

While the Du Pont parent company invested in a number of businesses, such as a New York City commission firm run by Victor, their most successful venture was the decision to invest in a gunpowder mill run by the younger son, Eleuthère Irénée (Figure 1). E. I. du Pont was no stranger to the powder business. During the 1780s, he had been an apprentice to Antoine Lavoisier, the famous chemist in charge of the France's state-run mill at Essonne.<sup>13</sup> While working for Lavoisier's Gunpowder Administration, he acquired knowledge of the latest techniques in saltpeter refinement and mechanized gunpowder production, a science at which the French state-run mills excelled.<sup>14</sup> Compared to European manufacturing techniques, the American gunpowder industry in the 1790s remained in a primitive state, unable to produce gunpowder in large quantities or of sufficient quality. For example, manufacturers relied on antiquated production methods, such as handworked mortar and pestle, to mix the powder. Knowledge

9. Thompson, "Causes and Circumstances"; Saricks, *Du Pont*, 269–271; Brown, *Ending the French Revolution*, 276–279.

10. Furstenberg, *United States Spoke French*, 227–286.

11. The firm was capitalized at \$800,000 at \$2,000 per share. Investor Jacques Bidermann consigned 56,000 acres of land in Kentucky for either settlement or sale in return for an equitable number of shares in the company; see Pierre Samuel du Pont de Nemours to Jacques Necker, April 8, 1801, in Marshall, *De Staël–Du Pont Letters*, 70; Saricks, *Du Pont*, 274–276.

12. Jefferson to P. S. du Pont de Nemours, January 17, 1800, in Boyd et al., *Papers of Thomas Jefferson*, 31:313.

13. Donovan, *Antoine Lavoisier*, 203.

14. Gillispie, "Science and Secret Weapons," 53–57.



Figure 1 Eleuthère Irénée du Pont de Nemours (1771–1834).

Eleuthère Irénée du Pont de Nemours (1771–1834), Eng. By E. G. Williams & Bro. NY, Engravings, Accession Number 70.182.8 Courtesy of the Hagley Museum and Library.

of how to refine calcium nitrate into potassium nitrate (the active ingredient in saltpeter) was little known in the United States, and American technical publications confirm that the introduction of alkaline salts to refine saltpeter was still little-used, and little-understood, in the manufacturing process, even if it had been known in Europe for centuries.<sup>15</sup>

Given the clear limitations of supply in the American market, the family's decision to invest in a powder mill should have been an obvious one. Nevertheless, the state of American political economy

15. Aber, *Art of Manufacturing Saltpetre*, 23; Partington, *Greek Fire and Gunpowder*, 323; Duveen and Klickstein, "American Edition."

in the late 1790s made such a venture anything but. From a practical standpoint, such a firm would be hindered as gunpowder was a highly regulated export commodity and received no tariff protection from the government. This, however, was not always the case. In 1790, political economist Tench Coxe estimated that the United States contained twenty-one powder mills that could produce up to 1.25 million pounds per year.<sup>16</sup> In his 1791 *Report on Manufactures*, Alexander Hamilton claimed these producers as one of the few industries that had achieved “a considerable degree of maturity.”<sup>17</sup> However, the health of American powder mills was not to last as the world descended into the wars of the French Revolution.

The decline of the American powder industry was tied to Federalist foreign and trade policy. Beginning in 1794, the Federalists passed legislation that exempted gunpowder from the tariff and, more importantly, prohibited its exportation.<sup>18</sup> The Washington and Adams administrations believed that it was too dangerous to countenance the munitions trade in a world at war. It was worth sacrificing the special interests of arms producers in order to keep the United States out of the global conflict. Although some merchants certainly smuggled American-made gunpowder out of the country, the federal government was willing to pursue charges against exporters all the way up to the Supreme Court, as they did in the case of *U.S. v. La Vengeance* (1796).<sup>19</sup> The effects of Federalist trade policy were apparent by the mid-1790s. Except for a few small powder firms that managed to hang on, domestic producers could not compete with what importations actually arrived from Europe. During the war scare with Great Britain, Coxe now warned, “We shall be exceedingly restrained in our operations ... by the want of Gunpowder.”<sup>20</sup> He estimated the total annual production at two hundred thousand pounds per year, less than a sixth of his

16. Philadelphia *Pennsylvania Packet*, March 11, 1790. For Coxe’s authorship of this piece, see Coxe to Hamilton, March 5, 1790, in Syrett and Cooke, *Papers of Alexander Hamilton*, 6:290–292n9. For Tench Coxe’s pro-manufacturing political economy, see Cooke, *Tench Coxe*; Öhman, “Perfecting Independence,” 431.

17. *Report on Manufactures*, December 5, 1791, in Syrett and Cooke, *Papers of Alexander Hamilton*, 10:284.

18. Peters, *Statutes at Large*, 1:369–370.

19. In March 1796, Philadelphia merchant Joseph J. Miller illegally shipped ten thousand pounds of gunpowder hidden in flour barrels to the French West Indies. Shipment of Gun Powder to the French West Indies, Whelen Papers, Receipts, 1786–1808. *U.S. v. La Vengeance*, in Marcus and Perry, *Documentary History of the U.S. Supreme Court*, 7:524–564.

20. Coxe to Jefferson, March 16, 1794, in Boyd et al., *Papers of Thomas Jefferson*, 28:39–40.

estimate half a decade before.<sup>21</sup> In 1795 an English traveler begged his friends to send him gunpowder as that available in the United States was expensive and of poor quality.<sup>22</sup>

In addition to the crippling legal restrictions on the international powder trade, there were more general concerns regarding the viability of large manufacturing establishments in an agrarian economy. In the *Report on Manufactures*, Hamilton argued that industrialization was a positive good for the economy. Despite high labor costs, in the short-term, manufacturing could be best supported through export bounties; modest revenue-generating tariffs; and by state-chartered, for-profit corporations such as New Jersey's Society for Establishing Useful Manufactures (SEUM).<sup>23</sup> Only in the long run, after the United States achieved parity with Great Britain, could it turn to a more protective mercantilist political economy. Although for-profit corporations became more common as the decade progressed, there was significant political pushback against individuals receiving limited liability for their personal business ventures.<sup>24</sup> Furthermore, it was not clear that incorporation would work for manufacturing establishments. At the turn of the century, most investment in North America, both foreign and domestic, was either in real estate or commerce, while the SEUM's textile mills had gone out of business. On the one hand, marine insurance, banks, land, and enslaved persons were the favored holdings of capitalists because these investments offered the highest rates of return with little overall risk. Manufacturing firms, on the other hand, carried a substantial risk as long as Great Britain maintained a comparative advantage in technology and labor costs, as well as the low barriers to trade granted by the 1795 Jay Treaty.<sup>25</sup>

21. Coxe to Knox, April 16, 1794, Papers of the War Department, 1784–1800. Between one-quarter and one-half of the country's powder supply in 1794 was made by one firm, that of Stephen Decatur Sr. in Frankford, Pennsylvania. See Samuel Hodgdon to John Stagg, January 6, 1794, Papers of the War Department, 1784–1800. Although in private Coxe cautioned Washington's Cabinet that the country lacked enough war material, in print he was much more sanguine: "The manufacture of gunpowder, has advanced with the greatest rapidity to the point of desire in regard to both quantity and quality." Coxe, *View of the United States*, 278.

22. Priest, *Travels in the United States*, 88.

23. McCoy, *Elusive Republic*, 159–161, 164–165; Nelson Jr., *Liberty and Property*, 41, 46–48; Thomson, *Structures of Change*, 16–18.

24. Schocket, *Founding Corporate Power*, 10–12; Murphy, *Empire State*, 209–210; Murphy, "'Convenient Instrument.'"

25. Ben-Atar, *Trade Secrets*, 10–13, 34–43; Thomson, *Structures of Change*, 20–22. For the importance of slavery for the development of capitalism in antebellum America, see Johnson, *River of Dark Dreams*, 31–42.



The election of Thomas Jefferson to the presidency in 1800 opened up the possibility that the producers of war material could thrive in the domestic and international markets. National debates over military preparedness in the 1790s led to a semiofficial Republican Party position that appeared well-suited to the interests of manufacturers, particularly the makers of arms and munitions. Jefferson opposed the ban on weapons exports in no uncertain terms: "Our citizens have been always free to make, vend, and export arms: that it is the constant occupation and livelihood of some of them. To suppress their callings, the only means, perhaps of their subsistence, because a War exists in foreign and distant countries, in which we have no concern, would scarcely be expected."<sup>26</sup> After the 1794 war scare and the resulting treaty with Britain, the Republicans took this opportunity to align their policy of commercial discrimination with the interests of domestic manufacturers.<sup>27</sup> James Madison announced in a widely distributed pamphlet that, contrary to the accusations of Federalists, his party was more than willing to "fill our magazines" with gunpowder as a necessary precaution.<sup>28</sup> After becoming president, Jefferson informed Congress that his armament policy would emphasize a competitive domestic market.<sup>29</sup> Numerous private producers, acting in their own self-interest, with moderate tariff protection and a vibrant export market awaiting their wares, could compete among themselves to bring down the cost of military goods for the federal government. When the Federalist tariff exemption and ban on weapons exports expired at the end of 1801, no Congressional Republican thought to reintroduce the measures. The revolution in America's political economy of war was profound. With rhetorical flourish, Jefferson explained that by relying on private producers the government could purchase "silver guns cheaper than they can make iron ones."<sup>30</sup> Far from opposing manufacturing in American political economy, Jefferson believed that the introduction of labor-saving machines to produce goods in rural areas was a positive development.<sup>31</sup> Gunpowder mills situated outside urban centers, such as that built by the Du Ponts, would have the added benefit of playing an essential role in

26. Jefferson to Hammond, May 15, 1793, in Boyd et al., *Papers of Thomas Jefferson*, 26:39.

27. Peskin, "Republicans Learned to Love Manufacturing," 235–262; Shankman, "New Thing on Earth," 323–352.

28. Madison, *Political Observations*, 11.

29. "To the Senate and the House of Representatives," February 2, 1802, in Boyd et al., *Papers of Thomas Jefferson*, 36:499.

30. Jefferson to Ferdinando Fairfax, September 13, 1804, *Papers of Thomas Jefferson*, Library of Congress.

31. Kasson, *Civilizing the Machine*, 25.

the country's national defense. After Jefferson's election, the Du Ponts understood that they could capitalize on the policies of the incoming Republican administration and Congress by deciding to invest parent company funds into a gunpowder mill.

On April 21, 1801, E. I. du Pont drew up Articles of Incorporation in Paris that would allow him to raise substantial capital from sources outside the family without having to petition the Delaware legislature for an act of incorporation or rely on American investors.<sup>32</sup> Compared to the United States in the late eighteenth century, France had relatively sophisticated corporate law.<sup>33</sup> The *société en commandite simple*, essentially a limited liability partnership with aspects of a joint stock company, was a favored legal institution in ancien régime France as it allowed the nobility to invest in commercial ventures without threatening their social standing. For the Du Ponts, organizing the firm in this manner offered them the benefits of raising outside funds while ensuring that the assets of their investors would receive some insulation from American lawsuits should the company fail. E. I. du Pont estimated that a competitive mill in the American market would require an initial capitalization of \$36,000. At \$2,000 per share, the family invested \$20,000 of their company's funds into the firm in order to maintain control over the venture. Under the proposed partnership, they would still need to raise \$16,000 from investors to make up the difference. Thus, in January 1801, E. I. du Pont and his older brother, Victor, returned to France to sell the remaining shares and purchase European manufactured machinery for the mill. The brothers were aided in these goals by their father's friends and investors in the parent company and by their contacts within the French military bureaucracy.

The pitch to potential investors emphasized the comparative advantage that a well-capitalized firm, utilizing the most advanced French technology, would have in the American market. Such a firm would easily be able to garner lucrative government contracts. In a memorandum distributed among potential investors, E. I. du Pont estimated that there were only two or three powder mills then operational in the United States. These few firms made poor quality powder by hand with mortar and pestle. Alternatively, "a manufacture in which nearly

32. Articles of Incorporation for the Establishment of a Manufacture of military and sporting powder in the United States of America, April 21, 1801, in DuPont, *Life of Eleuthère Irénée du Pont*, 5:225–259; Lewis, "The Capitalization of E. I. Du Pont De Nemours, 1801–1834," Manuscript Hagley Research Report, Hagley Museum and Library.

33. Kessler, "Limited Liability in Context," 511; Elbow, *French Corporate Theory*, 16.

all the work is done by machinery” would “count on a high price and a sure market for its product” by “supplying ... the Government for the Navy, for the Army, and for the Forts which are now nearly empty.”<sup>34</sup> Although he knew there was no guarantee, the military’s demand for powder would surely lead to numerous contracts and easy profits. In this vein, Victor du Pont wrote to the Swiss banker Louis Necker de Germany, requesting an investment and assuring him that the gunpowder mill would be “under the protection of the United States government and with the assurance of supplying it.”<sup>35</sup> Promises like these, even if there was no guarantee of a federal contract, convinced Necker to loan nearly \$10,000 to the Du Ponts and to become a shareholder in the mill. As he later admitted, it was the family’s “friendly relations with Mr. Jefferson” that convinced him to invest.<sup>36</sup> Based on similar beliefs about the firm’s prospects, other investors consigned goods, or paid in specie so that the Du Ponts could readily purchase French manufactured tools and machinery.<sup>37</sup> With these three shares supplied for, five remained of the original eighteen. Even though Necker’s loan covered the necessary operating expenses stated in the partnership agreement, there was still room for 5/18 of the company to be had at the ground floor price.<sup>38</sup> As evidenced

34. E. I. du Pont, “On the Manufacture of War and Sporting Powder in the United States,” in DuPont, *Life of Eleuthère Irénée du Pont*, 5:198–199. It should be noted that according to Louis Tousard, the Decatur Mill in Frankford did contain stamping and grinding mills, though it is unclear if these were done by machinery powered by water. Tousard to E. I. du Pont, January 2, 1802, in *ibid.*, 5:337; VanGelder and Schlatter, *Explosives Industry*, 71–72.

35. Victor du Pont to Louis Necker de Germany, March 21, 1801, in Marshall, *De Staël–Du Pont Letters*, 58. See also P. S. du Pont de Nemours to Jacques Necker, April 8, 1801, in *ibid.*, 71. In the case of Necker de Germany, he claimed that his investments were of a personal nature as he observed to Jacques Roman, “I took this interest in these enterprises only out of consideration for M. Dupont de Nemours and to oblige him.” Necker de Germany to Jacques Roman, November 28, 1802, in *ibid.*, 147.

36. Necker to Du Pont de Nemours, March 22, 1804, in *ibid.*, 207.

37. “Articles of Incorporation for the Establishment of a Manufacture of military and sporting powder in the United States of America,” April 21, 1801, in DuPont, *Life of Eleuthère Irénée du Pont*, 5:227–229. For Necker de Germany’s loan to the du Ponts, see du Pont de Nemours to Madame de Staël, May 22, 1803, in Marshall, *De Staël–Du Pont Letters*, 224; Victor du Pont to Du Pont de Nemours Père, fils & Cie., August 8, 1801, in DuPont, *Life of Eleuthère Irénée du Pont*, 5:257–258.

38. The original articles of incorporation signed in Paris specified eighteen shares at \$2,000 a piece, with ten shares (the majority) purchased by the parent company; see Pierre Samuel du Pont de Nemours to E. I. du Pont, December 31, 1801, in DuPont, *Life of Eleuthère Irénée du Pont*, 5:333. Louis Necker de Germany’s loan amounted to the equivalent of nearly five shares of the powder company, though instead of obtaining 6 percent of the profits, he would be paid back with 6 percent interest of his loan on a yearly basis, and the capital returned after ten years.

by the favorable reaction of the French and Swiss investors, the promise of federal protection was an essential component that convinced these capitalists to invest in a risky firm that had a high chance of complete failure given one stray spark.

In addition to the European investors, the family's assurances of state support allowed them to acquire advanced technology from France's Gunpowder Administration. Like other American industrial companies in the early republic, the firm relied on foreign technology and skilled labor to produce its goods. Unlike other companies, E. I. du Pont de Nemours & Co.'s easy ability to obtain advanced technology directly from the French government stood it in stark contrast to firms that relied on pirated British trade secrets.<sup>39</sup> Like the investors, the correspondence between E. I. du Pont and the administrators of France's Gunpowder Administration reveal that key individuals within the French military bureaucracy aided du Pont because of his assurances of "an enormous market and the protection of the Government."<sup>40</sup> The superintendent of the state-run Essonne mill was more than willing to help him find skilled laborers and duplicate the machinery at Essonne because the United States was "in rivalry" with Great Britain.<sup>41</sup> Geo-strategic self-interest ruled the day as the enemy of their enemy was their friend. The Gunpowder Administration readily supplied du Pont with whatever he wanted, from technical drawings to skilled laborers and copper tools. The relative importance of such cheap copper for the firm can be seen in the fact that E. I. du Pont estimated that fully one-quarter of the company's funds would be allocated to purchase these tools and machines.<sup>42</sup> Had the Federalists, and their Francophobic policies, remained in power after the election of 1800, it is doubtful if the French would have been so forthcoming. The firm's account book from this period confirms that du Pont was able to obtain all manner of copper machinery from the government's mills. In summer 1801, he recorded payments at Essonne for casts of the

39. Ben-Atar, *Trade Secrets*, 152–153; Thomson, *Structures of Change*, 20.

40. For the background of the Gunpowder Administration, see Bret, "Gunpowder Production"; Stapleton, "*Élève des Poudres*." For the company's correspondence, see E. I. du Pont to Mr. A. Bottée, January 26, 1802, in DuPont, *Life of Eleuthère Irénée du Pont*, 5:363; E. I. du Pont to Mr. Robin, January 25, 1802, in *ibid.*, 5:359–361; E. I. du Pont to Jean Riffault, January 25, 1802, in *ibid.*, 5:356–357; E. I. du Pont to Louis Tousard, February 28, 1802, in *ibid.*, 5:377; A. Bottée to E. I. du Pont, April 15, 1802, in *ibid.*, 6:16–17; Robin to E. I. du Pont, May 9, 1802, in *ibid.*, 6:46–49; Jean Riffault to E. I. du Pont, May 15, 1802, in *ibid.*, 6:50–51.

41. A. Bottée to E. I. du Pont, April 15, 1802, in *ibid.*, 6:16.

42. E. I. du Pont, "Estimate of the necessary cost of the Powder factory," in *ibid.*, 5:234; Robin, Superintendent of the Powder Works of Essonne and Isle Jean to E. I. du Pont, June 24, 1801, in *ibid.*, 5:232–233.

milling stamps and for copper “utensils” to refine saltpeter (Figures 2, 3, and 4).<sup>43</sup> The potential success of the gunpowder mill, premised on military contracts, was evident to French administrators, who each offered to invest in the factory but at much less than the \$2,000 per share.<sup>44</sup>

Although not recognized by American courts, the legal principles of the *société en commandite simple* signed in Paris determined how DuPont would raise funds in the United States as well. While E. I. du Pont was able to raise the required capitalization of the firm from his father’s Swiss and French investors, there still remained five outstanding shares in the powder mill. In order to sell the remaining shares, they turned to the American capital market. Despite interest shown by several merchants, the Du Ponts ultimately rebuffed them in favor of Francophone capitalists who understood the principles of French limited liability corporations. As Pierre later explained to the shareholders of the parent company, under American law any investor in the firm could be sued for the debts of the whole, and thus it was better to keep the company limited to French-speaking capitalists who understood the principles of limited liability and would not sue to obtain debts beyond what was invested.<sup>45</sup> Selling their shares to Americans for a profit would be a mistake, he reasoned, as it would increase each individual’s liability for the entire venture.

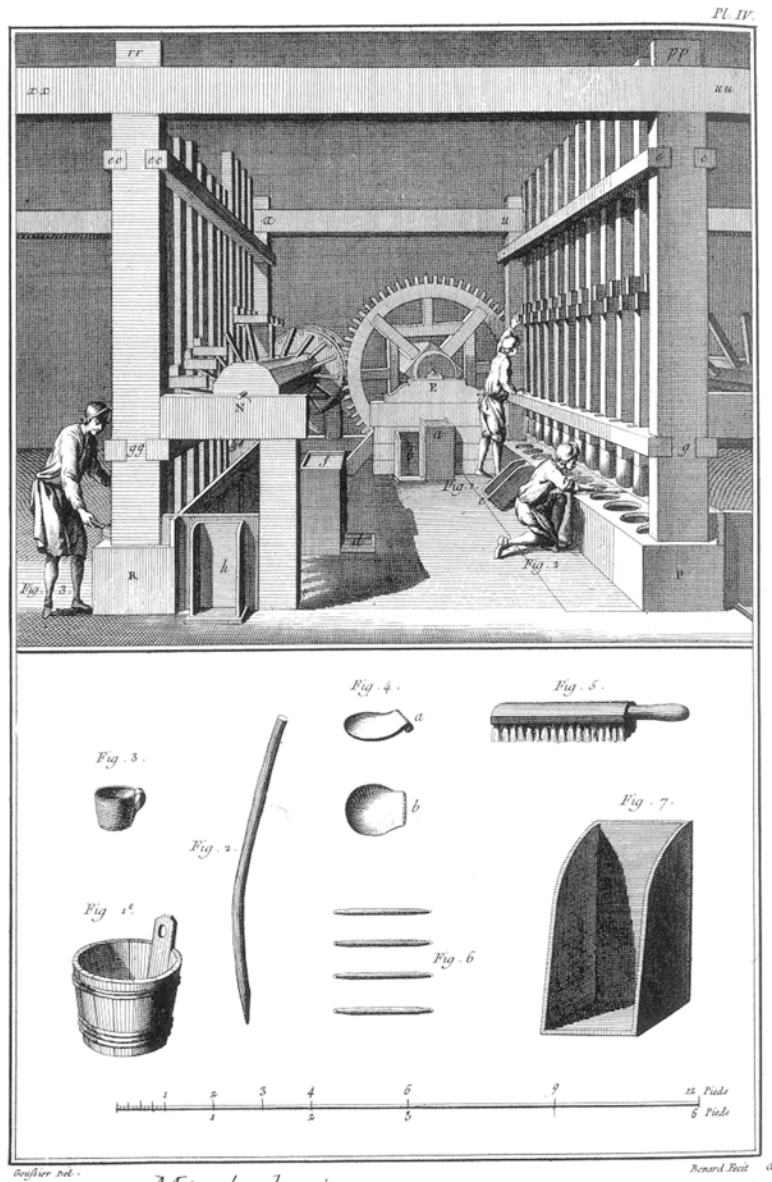
Fortunately for the Du Ponts, the Francophone expatriate community in Delaware provided a local source of funds and an understanding of the differences between French and American partnership law. Pierre Bauduy, a Saint-Domingue sugar plantation owner who settled in Wilmington during the early phases of the Haitian Revolution (and had obtained American citizenship) provided the firm with a source of capital in the United States.<sup>46</sup>

43. E. I. du Pont, “Account Book 1801,” in *ibid.*, 5:212–214.

44. Bottée was particularly useful in convincing skilled laborers, such as Charles François Parent, to emigrate to work in the mills, even if Parent would eventually form his own rival mill in New Orleans. See C. F. Parent to Bottée, February 6, 1803, in *ibid.*, 6:161–162; “Agreement with Parent,” in *ibid.*, 6:184–187; Thomas Brooks to E. I. du Pont, November 7, 1804, Eleuthera Bradford Du Pont Collection, Accession 146, Box 1, File 1, Hagley Museum and Library.

45. Thomas Brooks to E. I. du Pont, December 1, 1804, Eleuthera Bradford Du Pont Collection, Accession 146, Box 1, File 1, Hagley Museum and Library. For P. S. Du Pont’s explanation on the difference between French and American corporate law, see “Statement made by Du Pont (de Nemours) Père to the Shareholders in His Company,” April 18, 1808, in DuPont, *Life of Eleuthère Irénée du Pont*, 8:40–70.

46. Philadelphia merchant Archibald McCall challenged Pierre Bauduy (who Anglicized his name to Peter) for the outstanding shares of E. I. du Pont de Nemours & Company in the first half of 1802. After Victor du Pont liquidated his interests in the family’s mercantile concern, McCall insisted that he pay his debt of \$10,000, leading the du Ponts to be “embarrassed” to have to call on close friends for loans to cover the immediate capital requirements. See E. I. du Pont to Du Pont de Nemours, June 12, 1802, in DuPont, *Life of Eleuthère Irénée du Pont*, 6:67; see also the Articles of Agreement between Peter Bauduy and Du Pont de Nemours Père & fils & Cie, in *ibid.*, 6:108–109.



*Minéralogie, Fabrique de la Poudre à Canon .*  
*Vue perspective de l'intérieur du Moulin à Pêlons .*

Figure 2 Perspective view of the interior of the stamping mill.

Encyclopedia of Diderot & d'Alembert Collaborative Translation Project, "Natural History—Mineralogy—Manufacture of Powder." Originally published as "Histoire naturelle—Minéralogie—Fabrique des Poudres," *Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers*, vol. 6 (plates) (Paris, 1768).

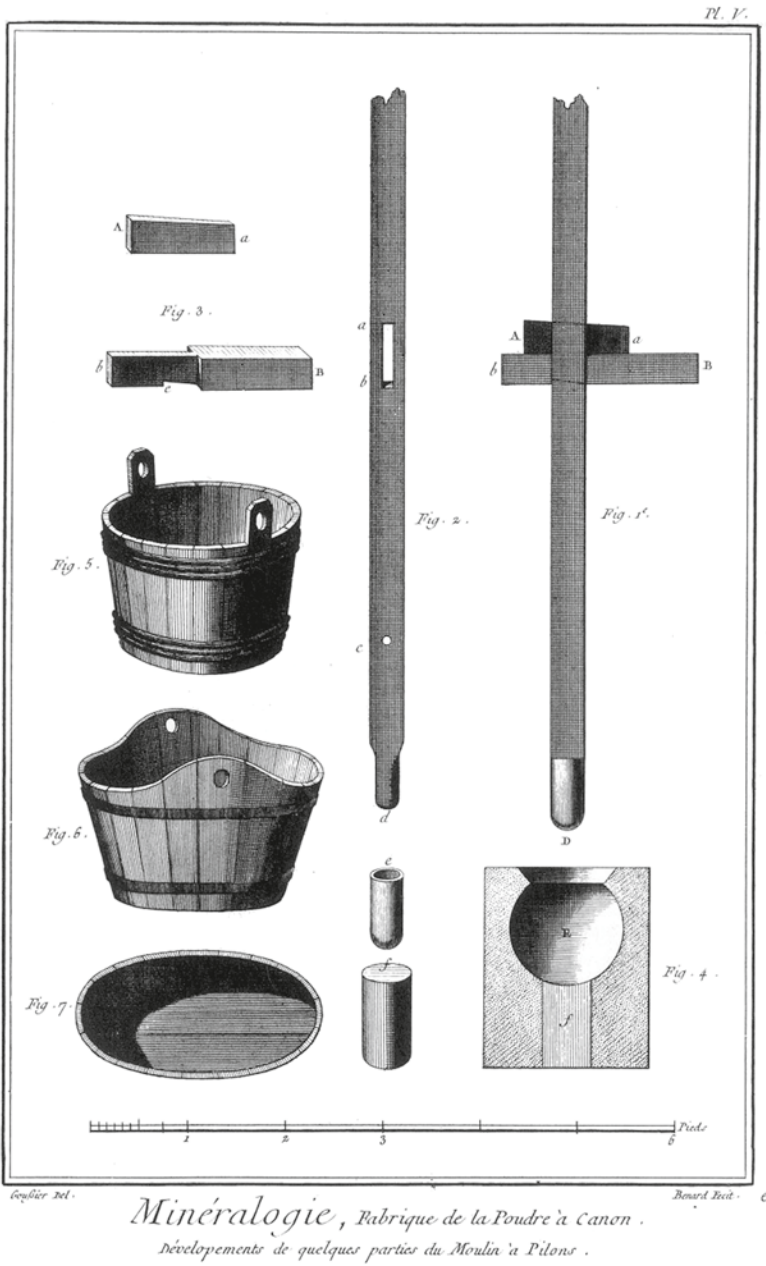


Figure 3 Development of some parts of the stamping mill.

See Figure 2.

Like the other shareholders, Bauduy was attracted to the business because he saw the potential of a well-capitalized mill employing the latest technological advances and aided by Jefferson’s policies and

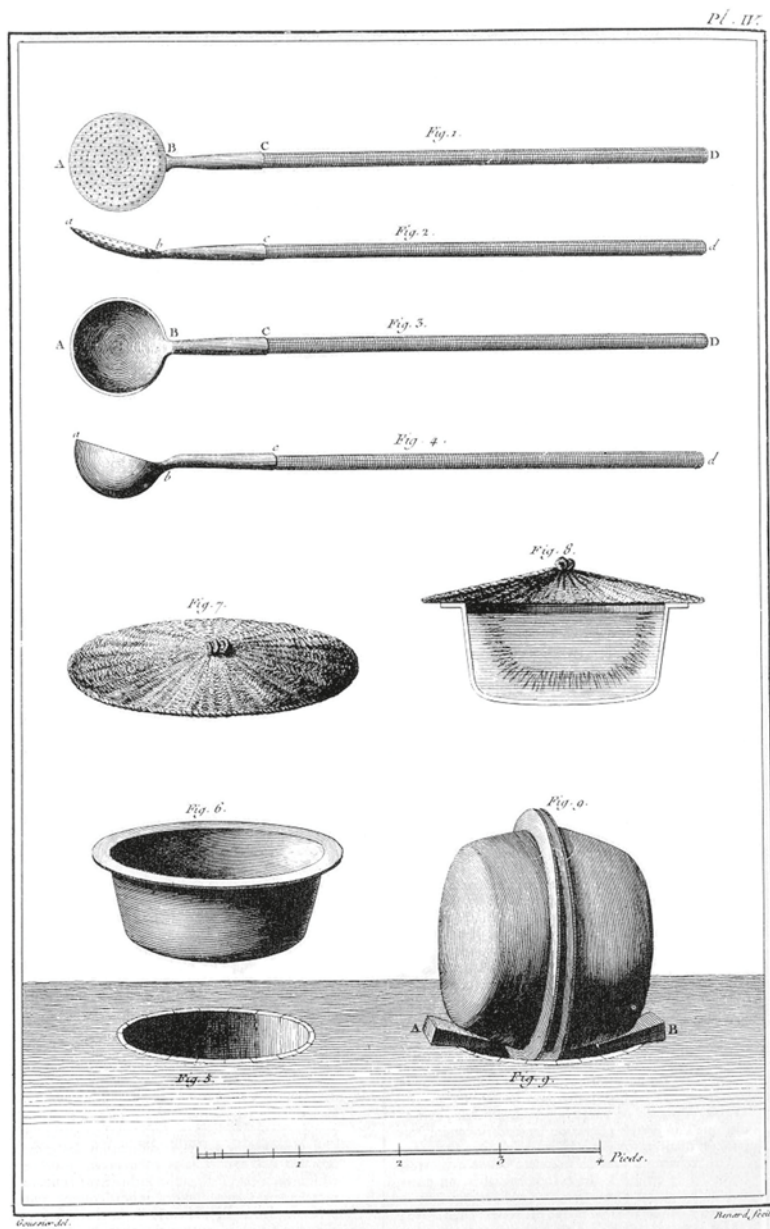


Figure 4 Extraction of saltpetre tools for the boiler and pans.

Encyclopedia of Diderot & d'Alembert Collaborative Translation Project. "Natural History—Saltpetre—Manufacture or Extraction of Saltpetre." Originally published as "Histoire naturelle—Salpêtre—Fabrique ou extraction du salpêtre," Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers, vol. 6 (plates) (Paris, 1768).



patronage.<sup>47</sup> His purchase of the remaining five shares placed funds toward the physical construction of the millworks along the Brandywine. In 1802 Bauduy estimated that the construction of the Eleutherian Mills would cost approximately \$7,000, or nearly 70 percent of the firm's available cash. Understanding that he was legally liable for all the firm's debts under U.S. law, Bauduy had, by January 1805, paid over \$12,000 to local farmers, artisans, merchants, and laborers to ensure the success of the firm.<sup>48</sup> Bauduy's investment allowed the Du Ponts to quickly complete their mill and begin production by the end of the year.<sup>49</sup> A local source of capital from a trusted investor provided the firm with the ability to conduct business easily on the American side of the Atlantic, just as their French and Swiss capital allowed them to purchase manufactured goods in Europe.

While the firm relied on Francophone sources of capital to begin operations, the company made a concerted push to gain federal contracts. Pierre Du Pont suggested to Thomas Jefferson that the federal government should do business with his son even before DuPont commenced operations. In December 1800, before the results of the contested presidential election were formally decided by the House of Representatives, Du Pont informed Jefferson that his family was about to build a gunpowder factory. The federal government should patronize their mill because it would produce a superior product through advanced technology. Although it might appear that the president would be playing favorites in an open market, Pierre assured him that "Under your presidency, everything will go *to the best* and the worthiest. And despite, *your, our*, extremely *democratic principles*, it will be said that in that sense *Jefferson leans towards the aristocracy*.—So does the sublime *president of the universe*."<sup>50</sup> Du Pont's meaning was clear: critics would claim that awarding contracts to his son's firm was a form of cronyism and partisan patronage. However, the superiority of the product would speak for itself. The following summer, after Jefferson's inauguration, Du Pont advised the president that the mills would soon be producing powder with technology and

47. "Propositions made by Peter Bauduy to Messrs. Du Pont," in *ibid.*, 6:74–76.

48. Peter Bauduy to E. I. du Pont, August 20, 1802, in *ibid.*, 6:104–107; "Irenee Dupont in account Current with Peter Bauduy in the Business of Brandywine Powder Mill," Eleuthera Bradford du Pont Collection, Accession 146, Box 9, File 148, Hagley Museum and Library.

49. E. I. du Pont de Nemours & Company, Receipt Books, 1802–1813, Eleuthera Bradford du Pont Collection, Accession 146, Box 9, File 148, Hagley Museum and Library.

50. P. S. du Pont to Jefferson, December 17, 1800, in Boyd et al., *Papers of Thomas Jefferson*, 32:312–315.

machinery that had been “made in France,” which “could hardly be made here.”<sup>51</sup>

While foreign and domestic investments were necessary for the purchase of machinery, the initial labor costs, and the construction of the mills, the Du Ponts still needed to sell gunpowder in the American market to turn a profit. Even though E. I. du Pont quickly developed a network of agents in the major cities along the Eastern seaboard to sell his gunpowder to civilians, his most coveted client was the federal government. By midsummer 1803, Victor and E. I. decided to appeal directly to Thomas Jefferson for a powder contract.<sup>52</sup> In their letter to the president, they explained that the factory required “significant support to get established” and any contracts for “war munitions,” whether new gunpowder, remanufactured powder, or refined saltpeter, would be mutually beneficial.<sup>53</sup> Upon receiving their letter, Jefferson forwarded it to Secretary of War Henry Dearborn, and told him, “If the public can with advantage avail themselves of his improvements in that art, it would be to encourage improvement in one of the most essential manufactures.”<sup>54</sup> Jefferson explained that Pierre Du Pont had been a “faithful & useful friend to this country,” aiding Franco-American diplomacy from the commercial negotiations of the 1780s to the recent Louisiana Purchase. Despite Jefferson’s pressing, the firm was outbid later in the year by a rival chemist to refine saltpeter at the Schuylkill Arsenal.<sup>55</sup> After losing the contract, E. I. explained this was not because their competitor could do the work at a cheaper price but that the Philadelphia chemist had likely miscalculated the amount that he could actually return. A few months later, Pierre wrote Jefferson from France, reminding him that his son’s mill deserved support.<sup>56</sup> His prodding finally produced results. The president concluded that it was “for the public interest to apply to your establishment for whatever can be had from that for the use either of the naval or military department,” and pressed Secretary of War Dearborn to contract with the Eleutherian Mills.<sup>57</sup> Shortly thereafter, E. I. du Pont

51. P. S. du Pont to Jefferson, July 23, 1801, in Boyd et al., *Papers of Thomas Jefferson*, 34:617–620.

52. Victor du Pont to E. I. du Pont, July 11, 1803, in DuPont, *Life of Eleuthère Irénée du Pont*, 6:243.

53. E. I. du Pont to Jefferson, July 20, 1803, in Boyd et al., *Papers of Thomas Jefferson*, 41:100.

54. Jefferson to Dearborn, July 29, 1803, in *ibid.*, 41:125.

55. E. I. du Pont to Jefferson, February 22, 1804, in *ibid.*, 42:327–328.

56. Pierre Du Pont to Jefferson, July 1, 1804, Thomas Jefferson Papers, Library of Congress.

57. Thomas Jefferson to E. I. du Pont, November 23, 1804, in DuPont, *Life of Eleuthère Irénée du Pont*, 7:28; Jefferson to Henry Dearborn, August 12, 1804, Thomas Jefferson Papers, Library of Congress.

received a patent for the use of machines in “granulating gunpowder.”<sup>58</sup> By the end of 1805, the firm had remanufactured seventy-five thousand pounds of gunpowder for the War Department (a process in which saltpeter is extracted from gunpowder and reincorporated with new sulfur and charcoal), and had gained a standing agreement to remanufacture additional powder through the remaining years of Jefferson’s presidency.<sup>59</sup>

In addition to the family’s connection to the president of the United States, E. I. du Pont also understood the importance of networking within an emergent American military bureaucracy. While the military establishment remained relatively small during the administrations of the Virginia Dynasty, the general staff and purchasing agents that did exist had wide authority to issue contracts in the manner they saw fit. Callender Irvine, the superintendent of Military Stores at the Schuylkill Arsenal, proved to be an important contact for du Pont within the government. While Du Pont de Nemours’ connection with Jefferson was necessary to get the Eleutherian Mills noticed, it was the friendship that developed between Irvine and the Du Ponts that proved a decisive long-term factor for continuing patronage in the form of yearly military contracts, not just for gunpowder but also for woolen goods when the family ventured into other manufacturing enterprises. When Irvine and du Pont began their correspondence in summer 1805, both men were just starting out in their respective fields: the general staff and gunpowder manufacturing. However, by the War of 1812, Irvine had risen to a position in which he was responsible for contracting on behalf of the U.S. Army, a rank that he would hold until 1841. As Irvine’s patronage power grew within the federal government, so too did the fortunes of DuPont.

In 1805 Irvine oversaw the execution of the first federal contract for E. I. du Pont: to remanufacture the powder that the military had condemned as unfit for use.<sup>60</sup> Over the course of the next five years, the two men corresponded frequently, met often in Philadelphia, and dealt with matters outside of government contracts such as the importation of Merino sheep for Irvine’s farm, and gambling on horse

58. William Thornton to Pierre Bauduy, October 27, 1804; and William Thornton to Pierre Bauduy, November 12, 1804, Longwood Manuscripts, Group 5, Series A, Box 21, Hagley Museum and Library; *List of Patents*, 48.

59. Work Done at DuPont’s Powder Mills Since the Beginning of their Establishment, 1833, Longwood Manuscripts, Group 5, Series C, Box 49, Hagley Museum and Library.

60. Callender Irvine to E. I. du Pont de Nemours & Co., June 11, 1805, in DuPont, *Life of Eleuthère Irénée du Pont*, 7:140; E. I. du Pont to Callender Irvine, June 13, 1805, in *ibid.*, 7:141.

racers.<sup>61</sup> During this time, the War Department continued to direct Irvine to manage the government's powder contracts with the firm, and the company's ability to consistently deliver large quantities of quality gunpowder supposedly led Dearborn to announce to a group of army officers on July 4, 1805 that DuPont "shall have all the government work."<sup>62</sup> Despite occasional quibbles over price and quality, production continued apace as both Secretaries Dearborn and Eustis continued to issue yearly orders of up to fifty thousand pounds of new powder in the period leading up to the War of 1812.<sup>63</sup> The government's steady orders proved fortuitous for the company's balance sheet. Between 1804 and 1814, federal sales represented between 40 percent and 60 percent of DuPont's annual production. Preparation for war during peace provided the Eleutherian Mills with a reliable source of income as the firm could count on a consistent demand from the government and that their friends would oversee the execution of contracts.<sup>64</sup>

In addition to these peacetime military contracts, DuPont was aided by a political economy that countenanced the export of munitions. As Table 1 demonstrates, between 1804 and 1811, the production of new gunpowder continued rapidly. Despite a dip in 1808 occasioned by Jefferson's export embargo, the firm increased both production and revenue year-on-year. Government business was certainly significant, especially the contracts to remanufacture damaged gunpowder. The company was also aided by the Republican Congress' willingness to let the ban on gunpowder exports expire in 1801 and to reimpose the 15 percent ad valorem tariff. Beginning in that year,

61. Callender Irvine to E. I. du Pont, September 29, 1810, in *ibid.*, 8:281–283; Peskin, *Manufacturing Revolution*, 276n18.

62. E. I. du Pont to Du Pont de Nemours, August 6, 1805, in DuPont, *Life of Eleuthère Irénée du Pont*, 7:155.

63. For the government's powder contracts with E. I. du Pont de Nemours & Company before the War of 1812, see Henry Dearborn to E. I. du Pont, December 30, 1808, Eleuthera Bradford du Pont Collection, Accession 146, Box 9, File 139; William Eustis to E. I. du Pont de Nemours & Company, December 12, 1809; William Eustis to E. I. du Pont de Nemours & Company, December 19, 1809; Benjamin Mifflin to E. I. du Pont de Nemours & Company, December 31, 1811. All citations from Hagley Museum and Library.

64. "Journal (Purveyor of Public Supplies)," August 13, 1803–May 30, 1812, vol. 20–22, *The Papers of Tench Coxe* microfilm edition, reel 6; "Purveyor of Public Supplies Ledger, 1803–1807," vol. 26, *The Papers of Tench Coxe* microfilm edition, reel 7; "Purveyor of Public Supplies Ledger, 1807–1812," vol. 27–28, *The Papers of Tench Coxe* microfilm edition, reel 8; all citations from the Historical Society of Pennsylvania. See also the yearly statements of contracts executed by the war department, such as "Statement of Contracts made of the War Department by Tench Coxe, Purveyor Public Supplies, in the year 1808," in Eustis, *Letter from the Secretary of War, Transmitting, In Obedience ...* and Eustis, *Letter from the Secretary of War, Transmitting Statements....*

Table 1 DuPont gunpowder production and revenues, 1804–1833

Year	Eagle Powder (lbs.)	Common Powder (lbs.)	Old Powder Remanufactured (lbs.)	Amount Sold to Government (lbs.)	Percentage of Powder Sold to Government	Revenue per Sales & Invoices Books
1804		38,525		10,200	26%	\$15,116.75
1805		77,210	75,000	95,000	62%	\$46,857.75
1806		107,219	67,200	77,150	44%	\$45,100.24
1807		129,076	32,950	47,200	29%	\$47,694.45
1808		104,400	93,900	124,000	63%	\$53,863.42
1809		163,006	40,300	60,900	30%	\$71,183.99
1810		184,975	400	40,600	22%	\$86,614.27
1811		204,056		12,200	6%	\$122,006.25
1812		299,788		91,700	31%	\$148,007.95
1813		335,677		157,000	47%	\$216,392.39
1814		519,551	825	234,875	45%	\$292,851.85
1815		461,700		94,575	20%	\$205,008.89
1816		551,250		96,875	18%	\$184,571.54
1817		703,831	33,600	48,300	7%	\$189,131.06
1818		350,896		29,800	8%	\$84,114.41
1819		491,964		61,900	13%	\$110,213.16
1820		477,179		91,050	19%	\$97,939.73
1821		614,086	38,625	94,425	14%	\$135,836.04
1822		514,540	15,187	42,187	8%	\$114,622.44
1823	5,037	628,029	23,048	23,048	4%	\$138,627.06
1824	10,521	668,128	25,435	202,085	29%	\$149,423.10
1825	10,584	650,611	58,741	97,591	14%	\$150,452.30
1826	9,391	569,611	28,072	100,497	17%	\$127,403.68
1827	11,742	676,620	20,561	138,861	20%	\$143,817.69
1828	16,189	700,197	22,058	127,558	18%	\$148,138.34
1829	16,025	677,578	18,908	30,208	4%	\$142,244.60
1830	14,705	828,142	10,246	26,746	3%	\$169,984.63
1831	17,076	767,814	4,866	11,166	2%	\$159,244.31
1832	17,529	887,137	6,265	40,265	5%	\$179,697.08
1833	22,481.5	1,023,544	14,001.50	182,602	18%	\$208,852.12
Totals:	151,280.5	14,405,780	630,188.50	2,490,564	N/A	\$3,985,011.43

Source: Data collated from "Work Done at DuPont's Powder Mills Since the Beginning of their Establishment, 1833," Longwood Manuscripts, Group 5, Series C, Box 49, Hagley Museum and Library; "Powder Made by E. I. du Pont de Nemours and Company, 1803–1856," Lammot du Pont Papers, Accession 384, Series B, Folder 48–27, Hagley Museum and Library.

as demonstrated by Figure 5, American powder exports rose precipitously, especially as the Haitian Revolution and Napoleonic Wars gripped the Caribbean and Europe. With the resumption of war between Britain and France, E. I. du Pont told his father that "the condition of war that exists in Europe is very promising for my enterprise. I will do all I can to profit by it."<sup>65</sup> What would allow the Eleutherian Mills to profit in the first place was Jefferson's noninterventionist foreign policy and tacit approval of the arms trade. Du Pont went on:

65. E. I. du Pont to Du Pont de Nemours, July 16, 1803, in DuPont, *Life of Eleuthère Irénée du Pont*, 6:251–254.

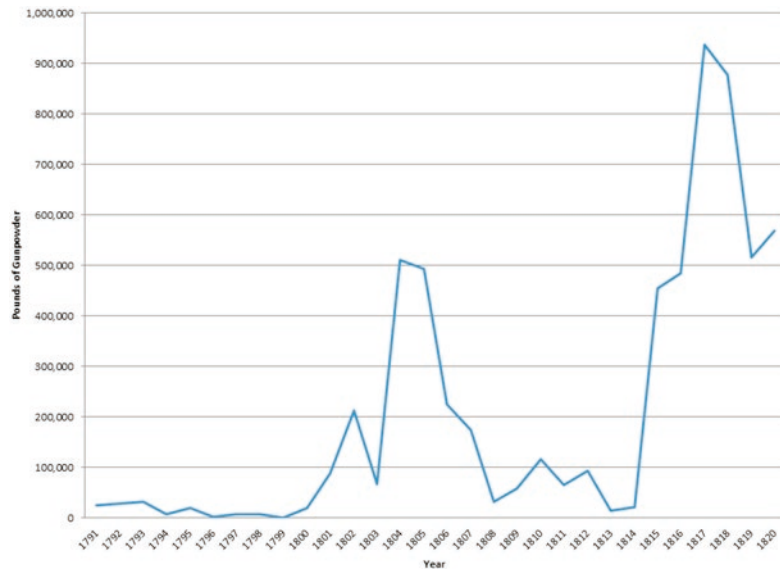


Figure 5 U.S. gunpowder exports, 1791–1820.

Data collected from Lowrie and Clarke, *American State Papers: Commerce and Navigation*, various pages.

“The merchants are delighted that continued neutrality will make it possible for them to profit by the new war. So everyone agrees in approving Jefferson’s policy and even has kind words for France and Bonaparte.”<sup>66</sup> Profit they did. In June 1805 Spain’s colonial agent in the United States entered into a contract with DuPont for forty thousand pounds of first-quality gunpowder for \$13,600, largely because the firm had prior experience producing military-grade munitions.<sup>67</sup> By October, the full amount of the contract was manufactured and loaded onboard a schooner engaged in trade with Vera Cruz.<sup>68</sup> Compared to the mercantile competition in New York City, the Du Pont brothers were in a strong position. A month after their contract with Spain, Victor reported to his brother that Samuel Ogden, a prosperous New York merchant, had purchased nearly two hundred thirty thousand pounds of “very poor quality” powder for just \$24,000.

66. E. I. du Pont to Du Pont de Nemours, July 16, 1805, in *ibid.*

67. Francis Breuil to E. I. du Pont, June 14, 1805, Longwood Manuscripts, Group 5, Series A, Box 3; Francis Breuil to E. I. du Pont, June 20, 1805, *ibid.*; Contract, Francis Breuil with the E. I. du Pont de Nemours & Co., June 24, 1805, *ibid.*, Series C, Box 49; Account, Francis Breuil with E. I. du Pont de Nemours and Co., August 13, 1805, Eleuthera Bradford du Pont Collection, File 46. All citations from Hagley Museum and Library.

68. *Federal Gazette*, August 24, 1805.

This powder would likely sell in the Caribbean for \$100,000 and “will by no means be sufficient for the demand.”<sup>69</sup> As long as they were able to produce a superior product, the operators of the Eleutherian Mills reasoned that they could command a significant place in the market.

While the Eleutherian Mills clearly benefitted from peacetime contracts, the War of 1812 acted as a test case for its business model. In the immediate lead-up to war, other firms entered the market to compete for government contracts. Some, like DuPont, were built on preexisting sources of capital, while others were able to obtain seed-money granted by the federal government. Gunpowder firms, like other manufacturers, were affected by the dual market forces of embargo and war. The 1807 *Chesapeake-Leopard* Affair, and the resulting embargo, greatly reduced the ability of American munitions makers to export their wares. However, the elimination of foreign competition through nonimportation, as well as the prospect of securing their own government contracts and supplying the domestic market, induced a number of firms to compete with DuPont. A brief analysis of three firms during the War of 1812 era—DuPont, the Franklin Powder Mill, and the Nitre Hall Powder Mill—demonstrates the mutually reinforcing relationship among capital investment, technology, and peacetime contracting for the development of the munitions industry.

As the War Department’s preferred peacetime firm, the Eleutherian Mills was one of two firms that received the greatest volume, and value, of the army’s wartime powder contracts. Their friend, Callender Irvine, ensured that the company was the first to receive lucrative contracts from his department as they had been a reliable supplier in the past.<sup>70</sup> Two contracts valued at nearly \$400,000 represented approximately half of the firm’s output for 1813 and 1814. Production jumped from a prewar high of 204,000 pounds in 1811, to 519,000 pounds in 1814. Revenues more than doubled in the same interval, while prices increased sixfold. The infusion of cash from the federal government, in both direct and indirect sales, allowed the firm to expand its operations to the Hagley Mills, a little downriver from the original site, purchase large quantities of raw materials, and ramp up overall production. Although the data presented in Table 1 show that less than half of the company’s sales went directly to the government, evidence indicates that federal and state purchasing agents acquired large amounts of DuPont powder on the open market. Before the declaration of war, tests at the Boston Navy Yard indicated that

69. Victor du Pont to E. I. du Pont, July 25, 1804, in DuPont, *Life of Eleuthère Irénée du Pont*, 6:320.

70. Callender Irvine to DuPont, February 18, 1812, Longwood Manuscripts, Group 5, Series A, Box 9, Hagley Museum and Library.

the vast majority of the gunpowder there was unfit for service.<sup>71</sup> The best solution, according to the local navy agent, was to purchase gunpowder from local merchants at retail prices, as many stocked DuPont powder.<sup>72</sup> Shortly after the navy expressed a need for their product, the firm forwarded 250 kegs to their commission merchant in that city.<sup>73</sup> By the end of the year, the Boston navy agent reported that his funds were exhausted “in the purchase of powder to supply the immediate demands of the station,” while the company eagerly expected to sell more at any time.<sup>74</sup> Despite mills operating in New England that sold a poorer quality product at half the price (profitable Connecticut firms continued to use labor-intensive mortar and pestle through the 1820s), the navy understandably rebuffed these companies in favor of more potent yet higher-priced products.<sup>75</sup> Between 1812 and 1814, DuPont proved that it was more than capable to supply a large portion of the country’s gunpowder.

While DuPont’s success demonstrates the importance of prior capitalization to meet the military’s needs in wartime, the Franklin Powder Mill shows how firms that relied on the federal government for capital improvements could easily fail, despite technological improvements and robust patronage networks. Immediately prior to the War of 1812, Dr. Thomas Ewell was the chief beneficiary of the navy’s plans to foster domestic gunpowder manufacturing. Unlike the Du Ponts, Ewell did not have an international network of investors with ready capital to invest in machinery, technology, construction, or labor. What he did have was a substantial network within the government and a technical mind. Ewell was a surgeon in the U.S. Navy attached to the Washington Navy Yard, the son-in-law of former Navy Secretary Benjamin Stoddert, and a frequent dinner guest of President Thomas Jefferson. With connections like these, he easily convinced Navy Secretary Paul Hamilton to loan him \$10,000 to begin a powder

71. William Bainbridge to Paul Hamilton, June 5, 1812, in Dudley and Crawford, *Naval War of 1812*, 1:130.

72. Amos Binney to Paul Hamilton, June 10, 1812, Amos Binney Letterbook, 1811–1814, American Antiquarian Society.

73. Peter Bauduy to John Hancock, June 21, 1812, DuPont Letterbook, 1810–1813, Hagley Museum and Library.

74. Binney to Hamilton, December 7, 1812, Binney Letterbook, American Antiquarian Society; E.I. du Pont de Nemours & Co. to John Hancock, October 21, 1812, Records of E. I. du Pont de Nemours & Co., Letterbook, 1810–1813, 187, Hagley Museum and Library.

75. East Hartford, Connecticut—John Mather’s Gunpowder factory, Records of 1820 Census of Manufactures, reel 4, National Archives and Records Administration. During the war, mostly privateers purchased the poor quality powder produced by the Connecticut firms. Edward and William Reynolds to Israel Whelen, March 31, 1813, Whelen Papers, Box 2, William L. Clements Library.



manufactory outside of Bladensburg, Maryland. Shortly thereafter, he obtained a very favorable contract from the navy that had a prewar price per pound double what was offered to DuPont by the army. This contract provided an ample advance, did not require that Ewell post security, and had no limit to the amount of powder that the navy would purchase from the doctor.<sup>76</sup> It was, in short, a sweetheart deal. Ewell's government funds were quickly allocated to construction, and in January 1812, the *National Intelligencer* reported that Ewell's Franklin Powder Mill was nearly completed and had the capacity to produce two thousand pounds per day.<sup>77</sup> Soon after construction of the mill, Ewell petitioned President Madison to help him garner further contracts with the federal government because the navy was "pleased to favor my undertaking."<sup>78</sup> Federal patronage and contracts allowed Ewell to quickly construct a mill that could rival that of E. I. du Pont in securing federal contracts.

Although Ewell obtained an investment from the government to finance his factory, he ultimately lacked the expertise to construct and manage it. Thus, he sought the help of DuPont and rightfully claimed that the military had provided "assurances of support."<sup>79</sup> When E. I. du Pont refused to aid Ewell, the doctor quickly resorted to attacks against his French heritage and connection with Thomas Jefferson.<sup>80</sup> Du Pont was predictably livid that federal agents created competition for his product. In early June, he cautioned Madison that the navy had placed all private powder mills in danger by doing business with a "shamefull" individual "who has succeeded in drawing upon

76. VanGelder and Schlatter, *Explosives Industry*, 74. The Senate report found that Ewell was granted \$5,000, while his chief opponent within the Navy Department, Charles W. Goldsborough, reported that it was \$10,000. See *Report of the Committee of Claims...*, 2; Charles W. Goldsborough to E. I. du Pont, October 7, 1812, Eleuthera Bradford du Pont Collection, Accession 146, Box 9, File 124, Hagley Museum and Library; E. I. du Pont to Charles W. Goldsborough, October 15, 1812, Hagley Museum and Library.

77. *National Intelligencer*, January 14, 1812.

78. Ewell to Madison, April 15, 1812, in Rutland et al., *Papers of James Madison, Presidential Series*, 4:322–323.

79. Stephen Decatur Sr. to E. I. du Pont, July 17, 1812, Eleuthera Bradford du Pont Collection, Accession 146, Box 2, File 13, Hagley Museum and Library; Thomas Ewell to E. I. du Pont de Nemours & Co., December 8, 1811, in E. I. du Pont, *Villany Detected*, 4. For Ewell's attempts to steal away DuPont's skilled workmen, see Hensley, "Brandywine Examples," 73–85.

80. Such attacks were common among the Federalist press, which often alleged that Republican Francophiles was pushing the United States into war. As one Federalist paper noted, it was "Thus with *French* powder, *French* cloths and *French* BRANDY, our country is traveling post haste to ruin"; this Federalist attack against the Du Ponts was reprinted in the Republican-leaning *Niles' Weekly Register*, July 30, 1812.

himself the attention and the favors of the government.”<sup>81</sup> Two days before the declaration of war on Great Britain, E. I. du Pont published a pamphlet intending to expose Ewell’s untrustworthy nature. His argument was essentially that the federal government should only contract with privately capitalized firms. Those companies directly financed by the federal government would be unable to compete in the market once the country returned to peace. Ewell’s favorable contract distorted the market by allowing the doctor to lure workers away from the Eleutherian Mills by offering higher wages, which were ultimately subsidized by taxpayer money. Du Pont denied the doctor’s claim that the Eleutherian Mills benefited from government contracts and disingenuously argued, “Since the establishment of our factory, we have received but a small share of the government’s patronage.”<sup>82</sup> If federal agents choose to do business with an unreliable individual with no capital, then the public stood to lose considerable funds and perhaps the war.

Du Pont’s concerns aside, the Franklin Mills benefited from the doctor’s technical mind, even if the firm lacked privately sourced capital and skilled labor. On December 7, 1813, Ewell received three patents for inventions related to “manufacturing gun powder.”<sup>83</sup> Later that month, he advertised to his competitors that he was willing to lease his inventions for as little as \$3,000 per machine and a portion of the firm’s profits.<sup>84</sup> The technology included the application of steam to purify and incorporate the raw materials, as well as granulate corned powder. His success with these labor saving machines was so great, he reported, that he was able to “discharge half of his workmen from his manufactory.”<sup>85</sup> Given the real usefulness of these improvements, it might be surprising that Ewell’s gunpowder mill failed by the end of the war. Built by very generous navy contracts, the Franklin Powder Mill was also destroyed when the government withdrew its support.

81. E. I. du Pont to Madison, [ca. June 1], 1812, in Rutland et al., *Papers of James Madison, Presidential Series*, 4:439–440.

82. E. I. du Pont to Thomas Ewell, December 16, 1811, in E. I. du Pont, *Villany Detected*, 1. Philadelphia powder manufacturer Stephen Decatur Sr. would write to E. I. du Pont that while he agreed with him regarding “the ungentlemanly liberties in which your chimerical correspondent has indulged himself,” when it came to the federal patronage of his firm, the claims of du Pont were “founded in misinformation, I never consulted its officers, nor solicited its favour, when I established the gun powder manufactory at Bellville.” Decatur to E. I. du Pont, July 17, 1812, Eleuthera Bradford du Pont Collection, Accession 146, Box 2, File 13, Hagley Museum and Library.

83. *List of Patents*, 130.

84. Cooper, *Emporium of Arts and Sciences*, 2:317–318.

85. *Ibid.*, 2:318.

At the end of December 1812, outgoing Navy Secretary Paul Hamilton awarded Ewell an additional contract that would prove to be the Franklin Powder Mill's downfall. The contract ostensibly specified that for every one hundred pounds of saltpeter supplied by the navy, the Franklin Mill would return the same weight in gunpowder and receive 1.5 cents per pound to refine the nitre, 6.25 cents to produce the powder, and 20 cents portage for each barrel delivered to the navy yard.<sup>86</sup> The problem for the government was that they never specified the quantity to be produced by Ewell, and awarded the firm extra expenses. Charles W. Goldsborough, the chief clerk of the navy department (and interim head) read through the contract on January 7, 1813, and immediately wrote to President Madison with his concern that Ewell was defrauding the country.<sup>87</sup> After receiving approval from Madison, Goldsborough placed a stop on the shipment of saltpeter and sulfur to the Franklin Powder Mill.<sup>88</sup> A bitter war of words then emerged between Ewell and Goldsborough in the city's print media. The decisive factor in shaping institutional perceptions of the debate arrived when Goldsborough provided proof that Ewell's powder was, in fact, far inferior to that produced by other firms for lower prices. Although the commandant of the navy yard initially ordered the acceptance of the substandard powder as it could be used for gunnery practice, incoming Navy Secretary William Jones resolved the matter by refusing to accept any more produced by the Franklin Powder Mill and cancelled their contract. Because Ewell lacked the funds to procure raw materials, and largely relied on the navy for shipments, his business quickly fell behind its competitors. Despite his advanced technology, network, and access to government capital, Ewell was finished as a manufacturer because he failed to meet the government's requirements on quality.<sup>89</sup>

While the Eleutherian Mills and the Franklin Powder Mill present stark contrasts on the relative importance of capital, technology, networking, and contracting, the Nitre Hall Powder Mill outside Philadelphia offers a middle ground between the two. Two merchants—Israel Whelen and William Rogers—who desired to shift some of their capital into manufacturing started it in 1810 as a venture. Although the firm's sources of direct funding are unknown, they were certainly

86. *Letter from the Secretary of the Navy...*

87. Goldsborough to Madison, January 7, 1813, in Rutland et al., *Papers of James Madison, Presidential Series*, 5:562.

88. Ewell to Madison, January 12, 1813, in *ibid.*, 5:565–566.

89. The dispute between Goldsborough and Ewell was long, wordy, and drawn out. For a summation of the charges against Ewell, and the navy's decision to act on them, see Goldsborough, *To the Public*, 22–25; Ewell to Madison, May 21, 1813, in Rutland et al., *Papers of James Madison, Presidential Series*, 6:327–328.

aided by European connections. Whelen was the U.S. representative of the Phoenix Fire Insurance Company of London, while Rogers had longstanding ties to British and French mercantile firms (and had even smuggled gunpowder to Saint-Domingue in the 1790s). Because of his position with the Phoenix Company, Whelen was able to parlay his connections to take out a \$120,000 insurance policy on the Nitre Hall Powder Mill after deleting the language in the standard printed contract forbidding just such an agreement.<sup>90</sup> Insurance allowed Nitre Hall to expand without having to stock away cash to cover the unexpected expense of an explosion. By 1812, the firm was in full production and manufactured a product that matched the quality of DuPont.

Nitre Hall's equivalent product, and its proximity to Philadelphia, garnered them a contract in the same amount as DuPont, as well as notice across the country. One group of Boston merchants explained that in their local market "the prejudice of the purchasers have been strongly in favour of Duponts, but they are generally convinced that yours is as good."<sup>91</sup> The company's success was evident when Callender Irvine wrote to the proprietors on December 10, 1813, informing them to stop shipments to the Schuylkill Arsenal as the government's storehouse was at its capacity.<sup>92</sup> The Nitre Hall Powder Mill was a reliable supplier to the War Department throughout the conflict (Table 2 and Table 3). Although the receipt evidence indicates that they did not deliver the full amount of gunpowder for which it was contracted, the Irvine letter indicates that this was simply because the army had more powder than it could actually use.

As the fates of these three firms indicate, peacetime military contracts let by the agents of the War Department continued to play a substantial role in the fortunes of the Du Pont family after the war. The first instance was in a rather unexpected location: the woolen industry. E. I. du Pont had long been a key player in the "Merino Mania" of the early nineteenth century, whereby agriculturalists and manufacturers united to introduce European-bred Merino sheep, and their fine wool,

90. Policy for \$120,000 on Nitre Hall Powder Mills with the Lancaster and Susquehanna Insurance Company, January 5, 1812, Whelen Papers, Box 1, William L. Clements Library.

91. Edward and William Reynolds to Israel Whelen, March 31, 1813, Whelen Papers, Box 2. The Alexandria, Virginia, mercantile firm of Jonah Thompson & Son likewise reported that the Nitre Hall Powder Mill's powder matched DuPont's in quality; however, the customers "are not willing to give up Dupont unless your powder come at a less price." Jonah Thompson & Son to Israel Whelen, September 23, 1811, Whelen Papers, Box 3. Both citations from William L. Clements Library.

92. Irvine to Whelen and Rogers, December 10, 1813, Whelen Papers, Box 1, William L. Clements Library.

Table 2 Gunpowder delivered by the Nitre Hall Mill to the Schuylkill Arsenal, 1812–1814

Month	# of Deliveries per Month	Gunpowder (lbs.)	Average Gunpowder per Delivery (lbs.)
August 1812*	2	2,000	1,000
March 1813**	1	1,700	1,700
April 1813	13	31,300	2,408
May 1813	12	41,700	3,475
June 1813***	13	50,200	3,862
July 1813	10	34,700	3,470
August 1813	13	62,700	4,823
September 1813	13	36,700	2,823
October, 1813	10	34,300	3,430
November 1813	11	43,800	3,981
December 1813	6	25,000	4,167
January 1814	2	8,400	4,200
February 1814	1	4,200	4,200
March 1814	8	28,300	3,538
April 1814	6	25,800	4,300
Totals (Average):	119 (8.5)	428,800 (30,628)	(3,598)

Sources: Receipts of Whelen and Rogers' Nitre Hall Gunpowder Mill with the U.S. Arsenal in Philadelphia 1812–1814, Israel Whelen Papers, Box 5, Receipts (1809–1812) and Box 6, Receipts (1813–undated), William L. Clements Library.

\* Prior to the issue of the first contract, not included in final summations and averages. First contract issued October 10, 1812, for 200,000 lbs. of gunpowder within twelve months (ended October 10, 1812).

\*\* Second contract issued by Callender Irvine, March 1, 1813, with duration of eighteen months (ended September 1, 1814).

\*\*\* First contract for 200,000 lbs. completed June 3, 1813, four months ahead of schedule.

into the American market.<sup>93</sup> In 1810, E. I., Victor, and Victor's son, Charles I. du Pont, used profits from the gunpowder mill to construct a water-powered factory to spin woolen yarn and weave fine Merino cloth.<sup>94</sup> Despite courting patronage for their fine cloth from figures as diverse as the influential Philadelphia legislator and son of the editor of the *Aurora General Advertiser*, William J. Duane, and rising Republican Congressman William H. Crawford, the woolen company's principle source of revenue came from military contracts.<sup>95</sup> Beginning in 1812, Callender Irvine approached the firm to produce

93. Peskin, *Manufacturing Revolution*, 173–181.

94. The firm began under the name DuPont, Bauduy & Co., but changed its name to Victor and Charles I. du Pont & Co. after Bauduy fled the United States for Cuba in 1816. After Victor du Pont's death in 1827, the firm's name changed to Charles I. du Pont & Co.

95. William J. Duane to Victor du Pont, October 25, 1813, Victor du Pont Papers, Group 3, Series A, Box 16; William Crawford to DuPont, Bauduy & Co., December 5, 1813; March 13, 1814; March 30, 1814; April 10, 1814; July 1, 1814. All citations from Hagley Museum and Library.

Table 3 War Department contracts for gunpowder, 1811–1815

Date	Contractor	Amount in lbs.	Price per 100 lbs.	Value	Destination
Aug. 21, 1811	E. I. du Pont	50,000	\$10.75	\$5,375	Schuylkill Arsenal (PA)
Oct. 9, 1812	E. I. du Pont	200,000	\$58	\$116,000	Schuylkill Arsenal
Oct. 10, 1812	Whelen & Rogers	200,000	\$58	\$116,000	Schuylkill Arsenal
Nov. 27, 1812	George Bendleman	62,000	\$60	\$37,200	Fort Columbus (NY)
Feb. 26, 1813	E. I. du Pont	500,000	\$56	\$280,000	Schuylkill Arsenal
Mar. 1, 1813	Whelen & Rogers	500,000	\$56	\$280,000	Schuylkill Arsenal
Apr. 5, 1813	Samuel & George Trotter	60,000	\$55	\$33,000	Pittsburgh (PA)
Apr. 2, 1814	Morrison, Taylor & Co.	60,000	\$49	\$29,400	Pittsburgh
Apr. 2, 1814	Samuel & George Trotter	60,000	\$49	\$29,400	Pittsburgh
Oct. 24, 1814	Unknown CT Firm	2,100	\$64	\$1,344	Norwich (CT)
Feb. 4, 1815	Randolph Ross	200,000	\$55	\$110,000	Richmond (VA)

Sources: Accurate data concerning governmental contracts for gunpowder before 1811 is spotty with regards to total gunpowder contracts on the part of government. See the War Department *Statement of Contracts...in the year 1811, 1812, 1813, 1814, and 1815*.

woolens because “[i]t is the desire of those who administer the Government to have the army clothed with domestic manufactured articles.”<sup>96</sup> Despite massive British imports following the resumption of peace in 1815, the firm remained in business because Irvine issued it annual contracts for army broadcloth and regularly advised the Du Pont brothers of the highest possible bid prices that the army could accept for domestically produced cloth.<sup>97</sup>

The government’s relationship with the Du Pont woolen venture, like their relationship with the gunpowder mill, was mutually beneficial. According to Irvine, the army had never had finer uniforms since they had started working with Victor and Charles I. du Pont & Co. After Congress downsized the army in 1821, and reduced the annual appropriation for uniforms, Irvine made sure that the Du Ponts continued to receive textile contracts. In February 1822, Irvine warned E. I. du Pont that the proprietors of factories in Cincinnati, Ohio, and Lexington, Kentucky, were making a concerted push for the government’s clothing contracts. One of these firms, the Cincinnati Manufacturing Company, was well connected as it counted William Henry Harrison among its owners and had previously been “engaged entirely in work for the United States.” Irvine suggested that du Pont “explain this matter to one of your friends in Congress” and emphasize that if

96. Callender Irvine to Du Pont, Bauduy & Co., August 30, 1812, Victor du Pont Papers, Group 3, Series A, Box 15, Hagley Museum and Library.

97. Callender Irvine to E. I. du Pont, April 30, 1816, E. I. du Pont de Nemours & Co. Series I, Part 1, Series B, Box 159, Hagley Museum and Library.

contracts were made with persons “having little more than three looms the government must make advances of money, a portion of which must be lost.”<sup>98</sup> Because the army now totaled 6,000 men, the proper interest of government required that all textiles should be “made in one factory.” Victor du Pont soon sent a letter to Congressman Louis McLane using Irvine’s exact recommendations.<sup>99</sup> Irvine and du Pont’s intervention in the political realm was apparently successful given that, despite the push of western Congressmen to get federal funds for producers in their states, DuPont remained the principle textile supplier. Victor and Charles du Pont & Co. did a brisk business with the army from the 1810s to the 1830s (Table 4).<sup>100</sup>

In the late 1820s, E. I. du Pont gave testimony to the Congressional Committee on Manufactures on the state of their textile firm. While they made some satinets out of Merino wool, and a little linsey for the clothing of enslaved persons, the firm mostly produced rough cloth for the army’s uniforms and blankets. Du Pont was sparing in his specifics on the finances of the firm, and mostly used this opportunity to defend ideological principles underlying tariffs in a liberal and capitalistic society. Despite the preferential treatment shown to the DuPont woolen factory by agents of the federal government, the business was a “losing one.”<sup>101</sup> The only reason why the firm continued to produce was because they were “carrying on other business, which enabled us to sustain our losses.”

The “other business” that E. I. du Pont referred to was, of course, his Mills of Liberty. Following the war there was a serious question as to whether or not DuPont would continue to hold a large share of the market as numerous other firms, such as the Nitre Hall Powder Mill, offered a product at a similar price and quality. Fortunately for DuPont, the War Department valued its long-standing relationship with the firm. In order to ensure that the company remained profitable despite limited government contracts for the foreseeable

98. Callender Irvine to E. I. du Pont, February 28, 1822, Winterthur Manuscripts, Accession Group 4, Series A, Box 5, Hagley Museum and Library.

99. Victor du Pont to Louis McLane, March 21, 1822, Victor du Pont Correspondence, Group 3, Series A, Box 5, Hagley Museum and Library.

100. For the attempts of western Congressmen to gain federal patronage for local contractors, see the speeches of John Telemachus Johnson, of Kentucky, and John Cocke, of Tennessee, *Annals of Congress, House of Representatives*, 17th Congress—1st Session, 624–625, 630, 1591–1593. In 1824 and 1825 Irvine again headed off attempts by New England firms to produce woolen goods for the army by warning the du Ponts; see Callender Irvine to Victor du Pont, December 3, 1824, Victor du Pont Correspondence, Group 3, Series A, Box 18; John Gethen to Victor du Pont, December 4, 1824, *ibid.* Both citations from Hagley Museum and Library.

101. E. I. du Pont testimony, in *Minutes of Evidence Taken Before the Committee on Manufactures...*, 122–125.

Table 4 Value of DuPont woolen contracts with the War Department, 1816–1833

Year	Value
1816	\$41,974
1817	\$55,232
1818	\$31,090
1819	\$37,830
1820	\$25,550
1821	\$29,710
1822	\$16,225
1823	\$15,475
1824	\$19,245
1825	\$16,600
1826	\$27,860
1827	\$21,600
1828	\$17,130
1829	\$15,750
1830	\$15,000
1831	\$12,720
1832	\$11,500
1833	\$20,796

Data for the years 1816–1818 collated from the War Department *Statement of Contracts... in the year 1816, 1817, and 1818*. Data for the years 1819–1833 collated from the annual contracts made by the War Department found in ProQuest Congressional U.S. Serial Set Digital Collection, H.R. Doc. No. 47, 16th Cong., 1st Sess.; H.R. Doc. No. 80, 16th Cong., 2nd Sess.; H.R. Doc. No. 41, 17th Cong., 1st Sess.; H.R. Doc. No. 60, 17th Cong., 2nd Sess.; H.R. Doc. No. 59, 18th Cong., 1st Sess.; H.R. Doc. No. 56, 18th Cong., 2nd Sess.; H.R. Doc. No. 101, 19th Cong., 1st Sess.; H.R. Doc. No. 181, 19th Cong., 2nd Sess.; H.R. Doc. No. 221, 20th Cong., 1st Sess.; H.R. Doc. No. 105, 20th Cong., 2nd Sess.; H.R. Doc. No. 86, 21st Cong., 1st Sess.; H.R. Doc. No. 73, 21st Cong., 2nd Sess.; H.R. Doc. No. 89, 22nd Cong., 1st Sess.; H.R. Doc. No. 118, 22nd Cong., 2nd Sess.; H.R. Doc. No. 99, 23rd Cong., 1st Sess.

future, George Bomford, the acting head of the Ordnance Department, decided to loan federally owned gunpowder back to the firm. In return, DuPont would supply the same amount at a future date. Because the government had gunpowder in its arsenals “far exceeding any probable demand for a considerable period of time,” it was a mutually advantageous loan for both parties.<sup>102</sup> It is doubtful that Bomford’s plan would have existed had it not been for E. I. du Pont’s direct intervention. In June 1816 he voiced his concerns on the state of the market directly to the Ordnance Department and complained that the competition “paid more mention to [gunpowder manufacturing] as an object of speculation than with any view of improving the art.”<sup>103</sup> Du Pont was right to be worried as other firms, which boasted French-trained powder manufacturers, had recently applied for contracts

102. Alexander J. Dallas to James Madison, May 29, 1815, Founders Online, National Archives (<http://founders.archives.gov/documents/Madison/99-01-02-4414>).

103. E. I. du Pont to George Bomford, June 17, 1816, Eleuthera Bradford Du Pont Collection, Accession 146, File 5, Hagley Museum and Library.



to get their own businesses off the ground.<sup>104</sup> Realizing that his company could lose market share if the competition offered a lower price, E. I. du Pont offered Bomford a deal: if the federal government would loan him poor quality or damaged gunpowder, he could sell that powder on the open market and produce a high-quality product for the government at a future date. Du Pont warned that only the continued patronage of the federal government during the postwar “general stagnation of business” would allow him to produce munitions for future conflicts. Swayed by du Pont’s reasoning, Bomford authorized loans of gunpowder to the Eleutherian Mills in order to ensure the long-term survival of the company. Agents of the Ordnance Department reasoned:

It is considered advisable (by the War & this Department) to spare the Powder belonging to the U. States, on Loan, which may not be of the very first quality, or which might be liable to deteriorate from long keeping in the stores or magazines in which it may be deposited; and to receive in Return Powder of the *best quality & proof*, as a kind of *Interest* for the accommodation afforded to the borrower. The Interest of our Manufactoires can also be promoted by such accommodation; enabling the proprietors to anticipate, & increase their sales.<sup>105</sup>

Over the course of the next year, the army loaned more than two hundred thirty thousand pounds of gunpowder to DuPont, which made up roughly one-third of the firm’s total sales for 1817.<sup>106</sup>

The loan of gunpowder greatly strengthened the firm’s finances in the postwar era. Following the termination of hostilities, the Caribbean market’s demand for arms and munitions provided the company with an outlet for wartime surplus. Between 1815 and 1819, U.S. gunpowder exports surged from a wartime low of less than ten thousand pounds in 1814 to greater than nine hundred thousand pounds in 1817. Despite this strong international demand, prices plummeted from the wartime high of 65 cents per pound to 25 cents.<sup>107</sup> DuPont, however, made up for potential lost revenues through the sheer volume afforded by the government’s loan of substandard powder. In the month of August 1816 alone, the company sold one hundred twenty

104. Jacques-Donatien Le Ray du Chaumont to Jacob Brown, March 25, 1816, Jacob Brown Papers, Box 1, Folder 9, William L. Clements Library.

105. John Morton to Nehemiah Baden, June 5, 1817, Nehemiah Baden Collection, Box 1, Folder 12, William L. Clements Library.

106. Lowrie and Clark, *American State Papers: Military Affairs*, 2:71.

107. E. I. du Pont de Nemours & Co. to Antoine Charles Cazenove, September 16, 1816, Records of E. I. du Pont de Nemours & Co., Letterbook 1815–1817, 160–161, Hagley Museum and Library.

thousand pounds of gunpowder “for export to Spanish America” through merchants in Baltimore.<sup>108</sup>

The government’s commitment to DuPont, and vice versa, proved important for the long-term geo-strategic interest of the United States. Supporting domestic gunpowder manufacturers in periods of peace ensured that they would be able to produce munitions during periods of war. When the Eleutherian Mills suffered a catastrophic explosion in 1818, E. I. du Pont reinvested his personal wealth back into the company because he had bright prospects for consistent business (Figure 6).<sup>109</sup> Within a year of the blast, peacetime production of the firm *exceeded* even that of wartime. Such an event in American business history was unthinkable two decades prior. By the 1820s, du Pont made frequent reference in his applications for government contracts to the fact that he had kept his company producing powder despite the literal destruction of his skilled labor pool and capital improvements.<sup>110</sup> The Ordnance Department agreed, and although E. I. du Pont de Nemours & Co. was never able to monopolize government contracts in the antebellum period and Civil War era the way they had during the early decades of the nineteenth century, the firm persisted as one of the country’s principal gunpowder suppliers.<sup>111</sup>



Figure 6 The Mills of Liberty, 1806.

Painting, No. 1 Eleutherian Mills 1806, by Charles Dalmas, Hagley Museum collections, G54.1.P17-6. Courtesy of the Hagley Museum and Library.

108. E. I. du Pont de Nemours & Co. to Peter Paul Francis Degrand, September 16, 1816, Letterbook 1815–1817, 165–166, Hagley Museum and Library.

109. Gilbert, “Gunpowder Production.”

110. E. I. du Pont to Decius Wadsworth, December 5, 1820, Eleuthera Bradford du Pont Collection, Accession 146, Box 9, File 139, Hagley Museum and Library.

111. Wilson, “Gentlemanly Price-Fixing and Its Limits.”

That E. I. du Pont de Nemours & Co. was the undisputed leader of the gunpowder industry can be seen in the Manufacturing Census of 1820. That year, DuPont introduced a specially formulated blasting powder designed to aid in the fracturing of rock, which would soon turn it from a company that was largely interested in government business to that of the civilian market. The firm reported to the census taker a total capital of \$240,000 invested in six water-powered mills and assorted outbuildings. The previous years' raw materials cost \$55,670, and ninety-five men were paid \$36,000 in wages.<sup>112</sup> These figures, taken alongside the firm's revenues for 1819 during the midst of a financial panic and collapse in commodity prices, gave the company a greater than 7 percent return on its capital investment for that year.

In comparison, the other gunpowder mills that DuPont had competed with during the War of 1812 did not fare as well. The Nitre Hall Powder Mill, which had supplied at least as much as DuPont during the war, now employed only twenty men between two mills.<sup>113</sup> Although the firm produced a similar quality product that was priced the same as its competitor, and received wide distribution in the American market, its output according to the 1820 Manufacturing Census was only two hundred thousand pounds per year. This was less than half of what DuPont produced. Despite explosions at the Nitre Hall Powder Mill in 1826 and 1831, it was able to remain in business until its proprietor died in 1841 and the property sold the following year.<sup>114</sup> Thomas Ewell's Franklin Powder Mill, on the other hand, was not recorded in the census because it no longer existed. In 1815 the doctor took a position as the professor of chemistry at Dickinson College and retired from the industry, defeated when the fostering hand of the state pulled back.<sup>115</sup> His mill was subsequently auctioned off in 1817 after Congress refused a petition to pay him for the powder that he had failed to deliver.<sup>116</sup>

The divergent outcomes of DuPont, Nitre Hall, and the Franklin Mill demonstrate the importance of both foreign capital and sustained

112. New Castle County, Christiana hundred, Delaware—Gun Powder manufactory on the Brandywine, Records of 1820 Census of Manufactures, reel 17, National Archives and Records Administration.

113. Delaware County, Haverford Township, Pennsylvania—Nitre Hall Powder Mills, Records of 1820 Census of Manufactures, reel 14, National Archives and Records Administration.

114. *Poulson's American Daily Advertiser*, July 7, 1826; *New York Evening Post*, July 20, 1831; *North American and Daily Advertiser*, November 18, 1840 and July 21, 1842.

115. *Weekly Aurora*, December 26, 1815.

116. *Daily National Intelligencer*, July 9, 1817; *Report of the Committee of Claims...*, 1–3.

peacetime government support for the gunpowder industry in the early republic and suggest the importance of military contracting for the nature of state–firm relations in the early republic. As a firm initially organized on the French *société en commandite simple*, DuPont was able to raise significant foreign capital and parlay that into advanced technology and sustained military contracts. By 1820, it was *the* largest gunpowder firm in the United States, with a market that penetrated into every state and the wider Atlantic world. DuPont's early focus on government sales would shape its long future with the federal government, a relationship that would last well through the Cold War. The firm produced munitions for the Civil War, Spanish–American War, both World Wars, and even managed the government's Savannah River nuclear facility until the late 1980s. In comparison, the Nitre Hall Powder Mill also benefited from access to foreign capital through the connections of proprietor Israel Whelen. His company also produced a product that was similar to that of DuPont, and was able to garner equal contracts during wartime. However, he ultimately lacked the connections to the country's military bureaucracy necessary to continue supplying the War Department. Despite Nitre Hall's ability to produce gunpowder on time and on budget, the company received no contracts after the War of 1812. Thomas Ewell, the proprietor of the Franklin Mill, was connected to the navy through professional and familial connections, and was able to obtain three patents from the federal government for his industrial improvements. However, the mill was completely dependent on the federal government for its capital. When federal funding was withdrawn, the company collapsed. As the case of DuPont demonstrates, foreign capital, with its ability to readily procure advanced technology—coupled with the ability to garner peacetime military contracts—were essential features for the success of firms engaging with the federal government to produce munitions during the early republic.

### Bibliography of Works Cited

#### *Books*

- Aber, Israel. *The Art of Manufacturing Saltpetre, by Cheap, Easy, and Expeditious Methods*. Newark, NJ: J. Woods, 1796.
- Adams Jr., Donald R. *Finance and Enterprise in Early America: A Study of Stephen Girard's Bank, 1812–1831*. Philadelphia: University of Pennsylvania Press, 1978.
- Appleby, Joyce. *Capitalism and a New Social Order: The Republican Vision of the 1790s*. New York: New York University Press, 1984.

- Balogh, Brian. *A Government Out of Sight: The Mystery of National Authority in Nineteenth-Century America*. Cambridge: Cambridge University Press, 2009.
- Ben-Atar, Doron S. *Trade Secrets: Intellectual Piracy and the Origins of American Industrial Power*. New Haven, CT: Yale University Press, 2004.
- Bodenhorn, Howard. *A History of Banking in Antebellum America: Financial Markets and Economic Development in an Era of Nation-Building*. Cambridge: Cambridge University Press, 2000.
- Boyd, Julian P., Charles T. Cullen, John Catanzariti, Barbara B. Oberg, and James P. McClure, eds. *The Papers of Thomas Jefferson*, 41 vols. (to date). Princeton, NJ: Princeton University Press, 1950–.
- Brown, Howard. *Ending the French Revolution: Violence, Justice, and Repression from the Terror to Napoleon*. Charlottesville: University of Virginia Press, 2006.
- Chandler Jr., Alfred D. *The Visible Hand: The Managerial Revolution in American Business*. Cambridge, MA: Harvard University Press, 1977.
- Chandler Jr., Alfred D., and Stephen Salsbury. *Pierre S. du Pont and the Making of the Modern Corporation*. New York: Harper & Row, 1971.
- Cooke, Jacob E. *Tench Coxe and the Early Republic*. Chapel Hill: University of North Carolina Press, 1978.
- Cooper, Thomas, ed. *The Emporium of Arts and Sciences*, new series, 2 vols. Philadelphia: Kimber & Richardson, 1813–1814.
- Coxe, Tench. *A View of the United States of America*. New York: Augustus M. Kelley, 1965.
- Cressy, David. *Saltpeter: The Mother of Gunpowder*. Oxford: Oxford University Press, 2013.
- Dalzell, Jr., Robert F. *Enterprising Elite: The Boston Associates and the World They Made*. Cambridge, MA: Harvard University Press, 1987.
- Doerflinger, Thomas M. *A Vigorous Spirit of Enterprise: Merchants and Economic Development in Revolutionary Philadelphia*. New York: W. W. Norton & Co., 1986.
- Donovan, Arthur. *Antoine Lavoisier: Science, Administration, and Revolution*. Cambridge: Cambridge University Press, 1993.
- Dudley, William S., and Michael J. Crawford, eds. *The Naval War of 1812: A Documentary History*, 3 vols. Washington, DC: Naval Historical Center, 1985–2002.
- DuPont, Bessie G., ed. *Life of Eleuthère Irénée du Pont from Contemporary Correspondence, 1778-1834*, 11 vols. Newark: University of Delaware Press, 1926.
- Du Pont, E. I. *Villany Detected*. Wilmington, DE: James Wilson, 1812.
- Dutton, William S. *Du Pont: One Hundred and Forty Years*. New York: Charles Scribner's Sons, 1942.
- Elbow, Matthew H. *French Corporative Theory, 1789–1948*. New York: Columbia University Press, 1952.
- Eustis, William. *Letter from the Secretary of War, Transmitting, In Obedience to the Act of the 21st April, 1808, Three Statements, Marked, A, B, C, of Contracts made by the Secretary of War, and the Purveyor of Public*

- Supplies, in the year one thousand eight hundred and eight, S&S# 18952.* Washington, DC: Roger Chew Weightman, 1809.
- . *Letter from the Secretary of War, Transmitting Statements of Contracts Made by him, and by the Purveyor of Public Supplies, during the year 1809, in obedience to an act of April 21, 1809, S&S# 21723.* Washington, DC: A. & G. Way, Printers, 1810.
- Frederickson, Kari. *Cold War Dixie: Militarization and Modernization in the American South.* Athens: University of Georgia Press, 2013.
- Furstenberg, François. *When the United States Spoke French: Five Refugees Who Shaped a Nation.* New York: Penguin Press, 2014.
- Gallatin, Albert. *Report of the Secretary of the Treasury on American Manufactures.* Brooklyn, NY: Thomas Kirk, 1810.
- Goldsborough, Charles W. *To the Public.* Washington, DC, 1813.
- Ha, Songho. *The Rise and Fall of the American System: Nationalism and the Development of the American Economy, 1790–1837.* London: Pickering & Chatto, 2009.
- Hounshell, David A. *From the American System to Mass Production, 1800–1932: The Development of Manufacturing Technology in the United States.* Baltimore, MD: The Johns Hopkins University Press, 1984.
- Hounshell, David A, and John Kenley Smith Jr. *Science and Corporate Strategy: Du Pont R&D, 1902–1980.* New York: Cambridge University Press, 1988.
- Johnson, Roxanne Therese. *An Analysis of the Early Record Keeping in the Du Pont Company, 1800–1818.* New York: Garland Publishing, 1989.
- Johnson, Walter. *River of Dark Dreams: Slavery and Empire in the Cotton Kingdom,* Cambridge, MA: Harvard University Press, 2013.
- Kasson, John F. *Civilizing the Machine: Technology and Republican Values in America, 1776–1900.* New York: Grossman Publishers, 1976.
- Larson, John L. *Internal Improvement: National Public Works and the Promise of Popular Government in the Early United States.* Chapel Hill: University of North Carolina Press, 2001.
- Lowrie, Walter, and Matthew Clarke. *American State Papers: Commerce and Navigation,* 2 vols. Washington, DC: Gales and Seaton, 1832.
- . *American State Papers: Military Affairs,* 7 vols. Washington, DC: Gales and Seaton, 1832.
- Madison, James. *Political Observations.* Philadelphia, 1795.
- Marcus, Maeva, and James R. Perry, eds. *The Documentary History of the Supreme Court of the United States, 1789–1800,* 8 vols. New York: Columbia University Press, 1985–2007.
- Marshall, James F., trans. and ed. *De Staël–Du Pont Letters: Correspondence of Madame de Staël and Pierre Samuel du Pont de Nemours and of Other Members of the Necker and du Pont Families.* Madison: University of Wisconsin Press, 1968.
- Martello, Robert. *Midnight Ride, Industrial Dawn: Paul Revere and the Growth of American Enterprise.* Baltimore, MD: The Johns Hopkins University Press, 2010.

- Meyer, David R. *The Roots of American Industrialization*. Baltimore, MD: The Johns Hopkins University Press, 2003.
- . *Networked Machinists: High-Technology Industries in Antebellum America*. Baltimore, MD: The Johns Hopkins University Press, 2006.
- McCoy, Drew R. *The Elusive Republic: Political Economy in Jeffersonian America*, Chapel Hill: University of North Carolina Press, 1980.
- Murphy, Brian Phillips. *Building the Empire State: Political Economy in the Early Republic*. Philadelphia: University of Pennsylvania Press, 2015.
- Nelson Jr., John R. *Liberty and Property: Political Economy and Policymaking in the New Nation, 1789–1812*. Baltimore, MD: The Johns Hopkins University Press, 1987.
- Ndiaye, Pap. *Nylon and Bombs: DuPont and the March of Modern America*. Translated by Elborg Forster. Baltimore, MD: The Johns Hopkins University Press, 2007.
- Novak, William J. *The People's Welfare: Law and Regulation in Nineteenth-Century America*. Chapel Hill: University of North Carolina Press, 1996.
- Partington, J. R. *A History of Greek Fire and Gunpowder*. Baltimore, MD: The Johns Hopkins University Press, 1999.
- Peskin, Lawrence A. *Manufacturing Revolution: The Intellectual Origins of Early American Industry*. Baltimore, MD: The Johns Hopkins University Press, 2003.
- Peters, Richard, ed. *The Public Statutes at Large of the United States... 1789 to March 3, 1845*, 8 vols. Boston: Little, Brown and Company, 1855–1856.
- Priest, William. *Travels in the United States of America: Commencing in the Year 1793, and Ending in 1797*. London: J. Johnson, 1802.
- Rutland, Robert A., and J. C. A. Stagg, Jeanne Kerr Cross, and Susan Holbrook Perdue, eds. *The Papers of James Madison: Presidential Series*, 8 vols. (to date). Charlottesville: University Press of Virginia, 1984–.
- Saricks, Ambrose. *Pierre Samuel Du Pont de Nemours*. Lawrence: University of Kansas Press, 1965.
- Schocket, Andrew M. *Founding Corporate Power in Early National Philadelphia*, DeKalb: Northern Illinois University Press, 2007.
- Sellers, Charles. *The Market Revolution: Jacksonian America, 1815–1846*. Oxford: Oxford University Press, 1991.
- Shankman, Andrew. *Crucible of American Democracy: The Struggle to Fuse Egalitarianism & Capitalism in Jeffersonian Pennsylvania*. Lawrence: University Press of Kansas, 2004.
- Smith, Adam. *An Enquiry into the Nature and Causes of the Wealth of Nations*. New York: Modern Library (1776) 2000.
- Smith, Merritt Roe. *Harpers Ferry Armory and the New Technology: The Challenge of Change*. Ithaca, NY: Cornell University Press, 1977.
- Syrett, Harold C., and Jacob E. Cooke. *The Papers of Alexander Hamilton*. New York: Columbia University Press, 1961–1987.
- Thomson, Ross. *Structures of Change in the Mechanical Age: Technological Innovation in the United States, 1790–1865*. Baltimore, MD: The Johns Hopkins University Press, 2009.

- Trumbull, J. Hammond. *The Memorial History of Hartford County Connecticut, 1633-1884*, 2 vols. Boston: Edward L. Osgood, 1886.
- VanGelder, Arthur P., and Hugo Schlatter. *History of the Explosives Industry in America*. New York: Columbia University Press, 1927.
- Wilkinson, Norman B. *Lammot Du Pont and the American Explosives Industry, 1850-1884*. Charlottesville: University Press of Virginia, 1984.
- Wright, Robert E. *One Nation Under Debt: Hamilton, Jefferson, and the History of What We Owe*. New York: McGraw Hill, 2008.

#### *Articles and Chapters in Books*

- Blaszczyk, Regina Lee. "Styling Synthetics: Du Pont's Marketing of Fabrics and Fashions in Postwar America." *Business History Review* 80 (Autumn, 2006): 485-528.
- . "Synthetics for the Shah: DuPont and the Challenges to Multinationals in 1970s Iran." *Enterprise & Society* 9 (December 2008): 670-723.
- Bret, Patrice. "The Organization of Gunpowder Production in France, 1775-1830." In *Gunpowder: The History of an International Technology*, edited by Brenda J. Buchanan, 261-274. Bath, UK: Bath University Press, 1996.
- Duveen, Denis I., and Herbert S Klickstein. "The 'American' Edition of Lavoisier's *L'art de fabriquer le salin et la potasse*." *The William and Mary Quarterly* 13 (October 1956): 493-498.
- Elzinga, Kenneth G. "Predatory Pricing: The Case of the Gunpowder Trust." *Journal of Law & Economics* 13 (April 1970): 223-40.
- Fujimura, Daijiro. "The Old Du Pont Company's Accounting System Lasting A Hundred Years: An Overlooked Accounting System." *Accounting Historians Journal* (June 2012): 53-88.
- Fagal, Andrew J. B. "American Arms Manufacturing and the Onset of the War of 1812." *New England Quarterly* 87 (September 2014): 526-537.
- Gilbert, Arlan K. "Gunpowder Production in Post-Revolutionary Maryland." *Maryland Historical Magazine* 52 (September 1957): 187-201.
- Gillispie, Charles Coulston. "Science and Secret Weapons Development in Revolutionary France, 1792-1804: A Documentary History." *Historical Studies in the Physical and Biological Sciences* 23 (1992): 35-152.
- Hensley, John R. "The Brandywine Examples: Case Studies in Industrial Espionage in Early Nineteenth-Century Delaware." *Delaware History* 21 (Fall-Winter 1984): 73-85.
- Hounshell, David A. "Interpreting the History of Industrial Research and Development: The Case of E. I. du Pont de Nemours & Co." *Proceedings of the American Philosophical Society* 134 (December 1990): 387-407.
- Johnson, H. Thomas. "Management Accounting in an Early Integrated Industrial: E. I. DuPont de Nemours Powder Company, 1903-1912." *Business History Review* 49 (Summer 1975): 184-204.
- Kessler, Amalia D. "Limited Liability in Context: Lessons from the French Origins of the American Limited Partnership." *Journal of Legal Studies* 32 (June 2003): 511-548.
- McNamee, Stephen J. "DuPont-State Relations." *Social Problems* 34 (February 1987): 1-17.



- Mullin, Richard P. "What Can Be Learned from DuPont and the Freon Ban: A Case Study." *Journal of Business Ethics* 40 (October 2002): 207–218.
- Murphy, Brian Philips. "'A Very Convenient Instrument': The Manhattan Company, Aaron Burr, and the Election of 1800." *The William and Mary Quarterly, Third Series* 65 (April 2008): 233–266.
- Öhman, Martin. "Perfecting Independence: Tench Coxe and the Political Economy of Western Development." *Journal of the Early Republic* 31 (Fall 2011): 397–433.
- Peskin, Lawrence A. "How the Republicans Learned to Love Manufacturing: The First Parties and the 'New Economy.'" *Journal of the Early Republic* 22 (Summer 2002): 235–262.
- Schakenbach, Lindsay. "From Discontented Bostonians to Patriotic Industrialists: The Boston Associates and the Transcontinental Treaty, 1790–1825." *New England Quarterly* 84 (Summer 2011): 377–401.
- Shankman, Andrew. "'A New Thing on Earth': Alexander Hamilton, Pro-Manufacturing Republicans, and the Democratization of American Political Economy." *Journal of the Early Republic* 23 (Autumn 2003): 323–352.
- Stapleton, Darwin H. "Élève des Poudres: E. I. du Pont's Multiple Transfers of French Technology." In *Gunpowder, Explosives and the State: A Technological History*, edited by Brenda J. Buchanan, 230–238. Burlington, VT: Ashgate, 2006.
- Thompson, Mack. "Causes and Circumstances of the Du Pont Family's Emigration," *French Historical Studies* 6 (Spring 1969): 59–77.
- Wilson, Mark R. "Gentlemanly Price-Fixing and Its Limits: Collusion and Competition in the U.S. Explosives Industry during the Civil War Era." *Business History Review* 77 (Summer 2003): 207–234.
- Wright, Robert E. "The Pivotal Role of Private Enterprise in America's Transportation Age, 1790–1860." *Journal of Private Enterprise* 29 (Spring 2014): 1–20.

#### *Newspapers and Magazines*

- Aurora General Advertiser* (Philadelphia, PA)  
*Daily National Intelligencer* (Washington, DC)  
*Federal Gazette* (Baltimore, MD)  
*National Intelligencer* (Washington, DC)  
*New York Evening Post* (New York, NY)  
*Niles' Weekly Register* (Baltimore, MD)  
*North American and Daily Advertiser* (Philadelphia, PA)  
*Pennsylvania Packet* (Philadelphia, PA)  
*Poulson's American Daily Advertiser* (Philadelphia, PA)  
*Weekly Aurora* (Philadelphia, PA)

#### *Misc.*

- Encyclopedia of Diderot & d'Alembert Collaborative Translation Project. "Natural History–Mineralogy—Manufacture of Powder." Ann Arbor: Michigan Publishing, University of Michigan Library, 2010. <http://hdl.handle.net/2027/spo.did2222.0001.549>.

- . “Natural History—Saltpetre—Manufacture or Extraction of Saltpetre.” Ann Arbor: Michigan Publishing, University of Michigan Library, 2010. <http://hdl.handle.net/2027/spo.did2222.0001.547>.
- Letter from the Acting Secretary of War, Transmitting Statements of Contracts Made at the War Department in the Year 1816*. Washington, DC: William A. Davis, 1817.
- Letter from the Secretary of the Navy, Transmitting a Statement of Contracts made by that department in the year 1812*. Washington, DC: 1813.
- Letter From the Secretary of War, Transmitting a Statement of Contracts for the Supply of Rations to the Army of the United States*. Washington, DC: A. & G. Way, 1814.
- Letter From the Secretary of War, Transmitting A Statement of the Contracts which have been Made During the Year 1812, for Supplying Rations to the Army of the United States, and A Statement Shewing the Contracts which have been Made During the Same Time by The Purveyor of Public Supplies and the Commissary General of Purchases at Philadelphia*. Washington, DC: A. & G. Way, 1813.
- Letter From the Secretary of War, Transmitting Statements of Contracts Made by Him, and The Purveyor of Public Supplies in the Year 1811*. Washington, DC: Roger Chew, 1812.
- Letter from the Secretary of War, Transmitting Statements of Contracts, made by the Commissary General of Subsistence, the Ordnance Department, the Commissary General of Purchases, and the Engineer Department, in the Year 1818*. Washington, DC: E. De Krafft, 1819.
- Letter from the Secretary of War, Transmitting Statements of Contracts made by the War Department, during the year 1814, and by the Commissary General of Purchases, from the First of January, 1814, to the First of November Following*. Washington, DC: Roger Chew Weightman, 1815.
- Letter from the Secretary of War, Transmitting Statements of Contracts made in the Year 1817, for Supplying the Army of the United States with rations; and the contracts made during the same year, by the Ordnance Department, and the Commissary General of Purchases*. Washington, DC: E. De Krafft, 1818.
- Letter from the Secretary of War, Transmitting the Annual Statement of Contracts made by the War Department for the Year 1815*. Washington, DC: William A. Davis, 1816.
- List of Patents Granted by the United States from April 10, 1790, to December 31, 1836*. Washington, DC: 1872.
- Minutes of Evidence Taken Before the Committee on Manufactures, First Session of the Twentieth Congress*. Washington, DC: 1828.
- Report of the Committee of Claims, to whom has been referred the petition of Thomas Ewell, February 19, 1817, S&S# 42550*. Washington, DC: 1817.

#### *Archival Sources*

American Antiquarian Society, Worcester, MA  
 Founders Online, National Archives, [www.founders.archives.gov](http://www.founders.archives.gov)

Hagley Museum and Library, Wilmington, DE  
Historical Society of Pennsylvania, Philadelphia  
Library of Congress, Washington, DC  
National Archives and Records Administration, Washington, DC  
Papers of the War Department, 1784 to 1800, [www.wardepartmentpapers.org](http://www.wardepartmentpapers.org)  
ProQuest Congressional U.S. Serial Set Digital Collection, <https://congressional.proquest.com>  
William, L. Clements Library, University of Michigan, Ann Arbor