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Inventing the U.S. Stove Industry, c.1815–1875: Making and Selling the First Universal Consumer Durable

This article examines the emergence of the American stove industry, detailing the complex interactions among changes in the product, the organization of production, and the methods of selling cast-iron heating and cooking equipment to consumers nationwide, particularly in the antebellum years. This highly competitive industry, composed of hundreds of proprietary firms, became a site of considerable innovation in marketing. Manufacturers integrated forward, controlling the sale and distribution of their goods through networks of small retailers nationwide. The article explains how and why.

Nearly forty years ago, Arthur H. Cole remarked in this journal that "economic and business historiographies" contained "surprisingly little on the means whereby [people] have kept warm," including "the evolution of heating apparatus for household or factory."[1] Not much has changed since then; his call to arms went unheeded. This article is a belated attempt to respond. It casts light into the most neglected corner of the history of one of nineteenth-century America's then significant, now almost forgotten, manufacturing industries—stovemaking.

This neglect deserves to be remedied, particularly in the light of the industry's economic importance at the time: in 1860, stoves made up almost a third of the value of cast-iron products and were responsible for all of the sector's growth in the 1850s; value added in stovemaking matched that in rail manufacturing, an industry whose significance probably requires less vigorous assertion before this journal's readers.[2]

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[1] Arthur H. Cole, "The Mystery of Fuel Wood Marketing in the United States," *Business History Review* 44 (Autumn 1970): 339.

[2] Peter Temin, *Iron and Steel in Nineteenth-Century America: An Economic Inquiry* (Cambridge, Mass., 1964), 39; Douglass C. North, *The Economic Growth of the United States, 1790–1860* (Englewood Cliffs, N.J., 1961), 164.

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We may know something about the development of its products and their reception within the home, the reasons for the growth in demand, and the distinctive labor process and pattern of labor relations in this skill-dependent trade, which was so strongly unionized at such an early date.[3] But we know almost nothing about how the makers of this pioneering and most durable of consumer goods, which achieved near universal penetration outside the South by the time of the Civil War, grew and served their market.[4]

This is regrettable, because distribution and selling were among stovemakers' major preoccupations. Thus the industry was a site of considerable innovation in marketing techniques, particularly during the antebellum years. Stovemakers developed methods of product differentiation, began to establish valuable brand identities, reached out to their consumers, and built their own direct-sales networks, at a time when few other manufacturers, particularly in the metalworking trades, saw any necessity to do likewise. Their efforts attracted sympathy at the time, rather than this article's respectful interest. The editors of the *Metal Worker*, the industry's leading trade journal, explained why:

> The position of stove manufacturers . . . is not one to be envied. In addition to making his goods he must sell them. . . . In the stove trade there is none of that smooth working machinery of distribution which enables manufacturers in other departments of productive industry to dispose of their products at small trouble and expense. He cannot consign his stoves to the commission merchant or the jobber, and draw against them. He . . . must himself set in motion the agencies by which to dispose of them. He thus incurs double burdens and a double risk.[5]

[3] Siegfried Giedion, *Mechanization Takes Command: A Contribution to Anonymous History* (New York, 1948), 527–36; Ruth S. Cowan, *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave* (New York, 1983), 53–62; Susan Strasser, *Never Done: A History of American Housework* (New York, 1982), chs. 2–3; Priscilla J. Brewer, *From Fireplace to Cookstove: Technology and the Domestic Ideal in America* (Syracuse, N.Y., 2000); Howell J. Harris, "Conquering Winter: U.S. Consumers and the Cast-Iron Stove," *Building Research and Information* 36 (July 2008): 337–50, and "The Rocky Road to Mass Production: Change and Continuity in the U.S. Foundry Industry, c.1890–1940," *Enterprise and Society* 1, no. 2 (2000): 391–437; Russell S. Bauder, "National Collective Bargaining in the Foundry Industry," *American Economic Review* 24, no. 3 (1934): 462–76.

[4] In 1860, one stove was sold for every five American households; by 1870, one for every four. Output data from industry veteran John S. Perry's presidential report to the inaugural meeting of the National Association of Stove Manufacturers [hereafter NASM] in 1872, cited in Jeremiah Dwyer, "Stoves and Heating Apparatus," in *One Hundred Years of American Commerce*, ed. Chauncey M. Depew (New York, 1895), vol. 2: ch. 51, 361; household numbers from *Historical Statistics of the United States: Earliest Times to the Present—Millennial Edition*, ed. Susan B. Carter et al. (New York, 2006), 1: ser. Ae79, 1–666. Ruth S. Cowan, "The Consumption Junction: A Proposal for Research Strategies in the Sociology of Technology," in *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, ed. Wiebe E. Bijker et al. (Cambridge, Mass., 1987), 272–76, is a partial exception to the general neglect of stove marketing in the literature.

[5] Editorial, "The Stove Manufacturers," *The Metal Worker* 5 (22 Jan. 1876): 6.

In this article, I will explain why those burdens and that risk were accepted—not willingly or without complaint, but in a context of no feasible alternatives—as the unavoidable price of building and maintaining a nationwide mass market. As Franklin L. Sheppard, a leading stovemaker, lamented to his colleagues in 1900, "Unfortunately we *have* to be merchants as well as manufacturers, which adds to the complexity of our business."[6]

* * *

The history of marketing is still a comparatively neglected area within the field of business history, but the secondary literature allowing us to understand common practice among nineteenth-century manufacturers of durable goods, though not abundant, is at least clear in its conclusions.[7] The argument of Glenn Porter and Harold Livesay's chapter on early-nineteenth-century marketing, published in 1971 but still the most thorough treatment, is summarized in its title, "The Merchant in Control." In the hardware trade, for example, the one most closely related to stovemaking, there was little forward integration by the makers of goods. Instead, they depended on networks of wholesalers and jobbers for buying and then distributing their products to the local storekeepers who sold them on to final consumers. "Retail generic goods . . . produced or imported in large quantities, available from many sources, and relatively inexpensive per unit" were these merchants' principal stock-in-trade. By mid-century, big-city wholesalers had developed means of servicing growing regional and national markets when the latter became too large for country jobbers and retailers to visit easily in person in order to settle accounts, inspect goods, and place orders. They opened "branch houses" in regional distribution centers to shorten customers' buying trips and speed up deliveries, and they employed traveling salesmen to maintain contact between trips, or even to spare customers the need to travel at all.[8] Few hardware manufacturers

[6] *Report of the Proceedings of the 29th Annual Meeting of the NASM*, 9 May 1900, 86 [emphasis added].

[7] Standard works—notably Susan Strasser, *Satisfaction Guaranteed: The Making of the American Mass Market* (New York, 1989) and Richard S. Tedlow, *New and Improved: The Story of Mass Marketing in America* (New York, 1990)—provide little context for this article, because they concentrate on a later period and on low-unit-cost perishable and/or immediate-consumption items. Roy Church, "New Perspectives on the History of Products, Firms, Marketing, and Consumers in Britain and the United States since the Mid-Nineteenth Century," *Economic History Review* 52, no. 3 (1999): 405–35, is the best literature review. Ronald A. Fullerton, "How Modern Is Modern Marketing? Marketing's Evolution and the Myth of the 'Production Era,'" *Journal of Marketing* 52, no. 1 (1988): 108–25, adopts a corrective approach that is in accord with my views on the subject.

[8] Glenn Porter and Harold C. Livesay, *Merchants and Manufacturers: Studies in the Changing Structure of Nineteenth-Century Marketing* (Baltimore, 1971), ch. 2, quotation from p. 35; see also Livesay, "Marketing Patterns in the Antebellum Iron Industry," *Business History Review* 45 (Autumn 1971): 269, 278, 286.

therefore saw much need to market their own goods, because the wholesalers did it for them, at the same time relieving them of the trouble and risk involved in assessing customers' creditworthiness and making collections. After the Civil War, the situation remained essentially the same: full-line, full-service wholesalers continued to be the dominant figures in hardware distribution.[9]

There were, of course, exceptions to the rule of minimal forward integration, even among manufacturers of metal goods. New England tinware manufacturers, suppliers of everyday utensils for household and farm, provide the leading example. They developed early in the century quite elaborate systems of peddling, which enabled them to grow and dominate the entire national market. Over time, some ex-peddlers, artisans, and other small entrepreneurs turned into specialized, sedentary tinware retailers, meeting the demand the peddling system had helped create. By mid-century, some of the manufacturers began to evolve into wholesalers, supplying their needs by using the same techniques as the hardware trade.[10] Other Yankee entrepreneurs did something similar at much the same time. Scovill, a Connecticut firm making buttons and other brass products, ended its earlier dependence on commission merchants and developed its own sales force in the late 1840s, establishing direct contact with wholesalers and retailers. This gave it no advantage, because its competitors followed suit. Thus, while traveling salesmen were rarely encountered in the brass trade in the 1830s, by the 1850s they were sufficiently numerous that even rural merchants could buy from a variety of competing suppliers.[11]

Among manufacturers of more costly, complex, and novel metal goods, sometimes designed for business rather than household use, we see similar patterns of mid-century innovation designed to close the gap between maker and market. Firms relied on relatives in other towns, on independent agents or branch offices in regional cities, or, occasionally, on traveling salesmen, to extend their sales reach. They also developed techniques to raise consumer and retailer awareness of their products: staging demonstrations at state and county fairs or national and international expositions; printing and distributing increasingly elaborate

[9] William H. Becker, "American Wholesale Hardware Trade Associations, 1870–1900," *Business History Review* 45 (Summer 1971): 180–82.

[10] Robert Friedel, "Piecing Together a Material Culture: Tinplate in Nineteenth-Century America," Hagley Research Seminar Paper no. 28, 12 Oct. 1995; David Jaffee, "Peddlers of Progress and the Transformation of the Rural North, 1760–1850," *Journal of American History* 78, no. 2 (1991): 533–35.

[11] Theodore Marburg, "Commission Agents in the Button and Brass Trade a Century Ago," *Bulletin of the Business Historical Society* 16 (Feb. 1942): 8–18, and "Manufacturer's Drummer, 1852, with Comments on Western and Southern Markets," *Bulletin of the Business Historical Society* 22 (June 1948): 106–14.

Detail of bank note, January 1, 1823. (Source: Box 9, folder 3, Samuel G. Wright papers, accession 1665, Hagley Museum and Library, Greenville, Del. Courtesy of Hagley Museum and Library.)

catalogs; and engaging in direct consumer advertising. In the celebrated cases of sewing machines and agricultural equipment, whose novel products had to be sold to individual customers, where instruction and after-sales support were essential, and—crucially—consumer credit had to be extended to consumers so that they could pay for the costly goods, companies like Singer and McCormick developed direct-sales forces, which were vital to their growth and market dominance.[12]

Stovemakers were prominent among these increasingly frequent exceptions to the normal rule of dependence on intermediaries for distribution and marketing. How and why they became so will be the focus of the rest of this article.

In the Beginning: The Blast-Furnace Era

Americans bought and used stoves in large numbers well before there was any distinct industry dedicated to their design, manufacture, and supply. Instead, stoves and stove plates were simply a major product of rural, charcoal-fueled iron furnaces, particularly those in southeast Pennsylvania and southwest New Jersey.[13] When sold in fully assembled

[12] Arthur H. Cole, "Marketing Nonconsumer Goods before 1917: An Exploration of Secondary Literature," *Business History Review* 33 (Autumn 1959): 420–28; Robert A. Lynn, "Installment Credit before 1870," *Business History Review* 31 (Winter 1957): 414–24; Andrew B. Jack, "The Channels of Distribution for an Innovation: The Sewing-Machine Industry in America, 1860–1865," *Explorations in Entrepreneurial History* 9 (Feb. 1957): 113–41; Pamela W. Laird, *Advertising Progress: American Business and the Rise of Consumer Marketing* (Baltimore, 1998), 33–37.

[13] According to Tench Coxe's *A Statement of the Arts and Manufactures of the United States of America, for the Year 1810* (Philadelphia, 1814), 23–24, these two states were responsible for 61 percent of total iron furnace output. See also Arthur D. Pierce, *Iron in the Pines: The Story of New Jersey's Ghost Towns and Bog Iron* (New Brunswick, N.J., 1984).

form, they found a strictly local market (because of the cost and difficulty of transporting heavy, bulky, and surprisingly fragile cast-iron items by wagon), but they gained much wider distribution to cities and towns on navigable waterways along the East Coast in the more convenient form of flat-packed plates for assembly, finishing, and marketing by local manufacturers and dealers.[14] In Philadelphia, the center of the district where most stove plate was made and stove use first became commonplace, there were just two pattern makers and three stove finishers recorded in the early 1820s. Another two firms made stoves alongside other metal products. However, even though the city was not a major production site, it was nevertheless the decentralized industry's mercantile and entrepreneurial heart—the most important place where capital was raised, decisions were taken, goods sold, and deals made. Three major furnace operators had their home offices there, including Samuel Wright, who ran the Delaware Furnace at Millsboro in southern Delaware and Dover Furnace, near Toms River, New Jersey, and David Wood, proprietor of the Cumberland Furnace, Millville, also in southern New Jersey. Fortunately, many of Wright's and Wood's records survive, so it is possible to reconstruct their pattern of operations quite accurately.[15]

At the start of the 1820s, Wright, for example, was already trading as far east as Portland, Maine, and as far north as Albany, New York. His Albany customers, in turn, began selling as far afield as Ohio and Michigan almost as soon as the Erie Canal opened for business in 1825, while his seaboard clients from Baltimore northward continued to serve their immediate hinterlands. Stove manufacturers and dealers placed annual bulk contracts at a fixed tonnage price and with stipulated delivery schedules designed to ensure that enough stock was available to meet highly seasonal demand. The largest contracts exceeded one hundred tons, or one thousand stoves a year. Most of these orders were for generic types, which had been in production almost unchanged for decades: the box or six-plate stove for room heating; the ten-plate stove (a box stove with a small oven for cooking); the Franklin stove for parlor heating and cooking; and the cannon stove, for space heating. Stove plates were usually made from the furnace's own patterns, but some were also cast from the manufacturers' or dealers' patterns that had

[14] Manufacturers were usually dealers too, i.e. they manufactured in order to trade, as retailers and jobbers combined; and dealers also had to engage in manufacturing unless they contracted it out or bought their finished stock from manufacturers. When manufacturer-dealers also took control of design and pattern-making, as they commonly had by the 1830s, then they, not furnacemen, became responsible for most of the value added in stovemaking, even before they became foundrymen too.

[15] *Philadelphia in 1824* (Philadelphia, 1824), 38; *Commercial Directory* (Philadelphia, 1823), 177–79.

been sent to the furnace to be molded, or from other makers' designs that were on deposit at the same furnace or were available for copying. Marketing depended on the manufacturers and dealers or on their retailer clients, rather than on the furnace operators themselves. Advertisements directed to local consumers were essentially invitations to come and inspect generic goods, which were barely described and rarely sold under the maker's name. Transactions between furnacemen and their customers were complex. Payments were sometimes made in agricultural commodities and scrap, or in miscellaneous business services. Stoves thus formed only a part of the trade with clients, who were usually general merchants (as indeed were Wood and Wright themselves) rather than specialists. Settling accounts was a laborious, uncertain affair: maintaining mutually profitable or at least tolerable business relationships depended on trust and a great deal of patience, because furnacemen and their customers were bound together by long and often indirect chains of credit rather than regular cash payments.

Customers, too, had reasons for complaint: their letters are full of protests about incomplete orders, late deliveries, and poor quality. Blast-furnace castings were typically crude and heavy, variable in shape and size, with poor surface finish, and thus hard to assemble and sometimes impossible to sell. Slow communications between customers and the Philadelphia offices, between the latter and the furnaces, and then back again, multiplied the possibilities for confusion, misunderstanding, and delay. Weather and the seasons also interposed obstacles to a smooth process of production and distribution: too little rain to drive the furnace's mill-wheel, then so much that floods destroyed the machinery; too hot to work in high summer, and then too cold in midwinter, when the molding sand froze solid in the casting-shed, and ice encrusted the mill-wheel and blocked the rivers, those vital transport arteries; storms and contrary winds keeping coastal shipping locked in port for weeks on end, or trapped out at sea unable to make landfall. Leading all the other difficulties were the chronic problems these rural furnaces faced in recruiting and retaining an adequate supply of skilled workers, which translated directly into high costs, undependable volume and quality of output, and unreliable delivery schedules.[16]

[16] Summarized from the Wright papers and the David C. Wood papers, Accession 1772, Hagley Museum and Library, Greenville, Del. Wright's span the years 1820–1837; Wood's, 1819–1846. Records of other similar mid-Atlantic furnaces also survive; see Joseph E. Walker, *Hopewell Village: A Social and Economic History of an Iron-Making Community* (Philadelphia, 1966), 153–64, and Donald A. Crownover, *Manufacturing and Marketing of Iron Stoves at Hopewell Furnace 1835–1844* (Washington, D.C., 1970), 94, 105–7, 109. John Bezis-Selfa, *Forging America: Ironworkers, Adventurers, and the Industrious Revolution* (Ithaca, N.Y., 2003), has made extensive use of the Wright papers, among others, but his

But despite its limitations, this distended system of production and trade was indispensable during the first stages in the growth of demand from a wide range of household, business, and institutional customers, and it continued to develop through the 1830s. The Philadelphia region remained the principal source of supply for dealers and manufacturers in towns and cities accessible by ship, while, beyond this coastal strip, country blast furnaces began to make stove plate and serve their local markets, combining two or more of the roles of manufacturer, retailer, and jobber (to neighboring retailers) from the outset.[17]

The central role of blast furnaces in the production of stoves and many other cast-iron consumer products continued to be protected by the high cost and difficulty of transporting raw materials more than a few miles. When Philadelphia entrepreneurs first tried to bring Lehigh Valley anthracite to market during the fuel shortage caused by the War of 1812, it cost them only one dollar per ton to mine the coal, but they had to spend at least four dollars to haul it a few miles to the water's edge, and then another nine dollars to float it to the city in crude "arks" down unimproved rivers.[18] Until transportation improved significantly, rural furnaces' urban customers had to have their stove plate cast at these remote locations, because the semifinished product, which was much higher in value and smaller in volume, could bear the cost of shipment, whereas the raw materials could not. In these circumstances, urban stove manufacturers and wholesalers were able to take control over the processes of design and invention, but they remained dependent on country furnaces for their castings supply. In the mid-1830s, a period of dramatic growth, they began to free themselves from these limitations on the industry's efficiency.

The Emergence of the Stove Foundry

Data on fast-rising stove output in the 1830s and 1840s are at best good approximations (see Figure 1), but fortunately other useful series are available that more accurately indicate key aspects of the early phases

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book is marred by his desire to see conflict rather than sheer intractability in the employment relationship. Thomas M. Doerflinger, "Rural Capitalism in Iron Country: Staffing a Forest Factory, 1808–1815," *William and Mary Quarterly* 59, no. 1 (2002): 3–38, on New Jersey's Martha Furnace, is a less tendentious and more trustworthy guide.

[17] U.S. Secretary of the Treasury, *Documents Relative to the Manufactures in the United States, Collected and Transmitted to the House of Representatives in Compliance with a Resolution of Jan. 19, 1832* (Washington, D.C., 1833), 1: 750, 760; 2: 101–2, 105–7, 267–8, 374, 668–71, 812–14.

[18] Charles Miner, letter to State Senator S. J. Packer, 17 Nov. 1833, Doc. 17 in *Report of the Committee of the Senate of Pennsylvania, Upon the Subject of the Coal Trade* (Harrisburg, 1834), 94, 96.

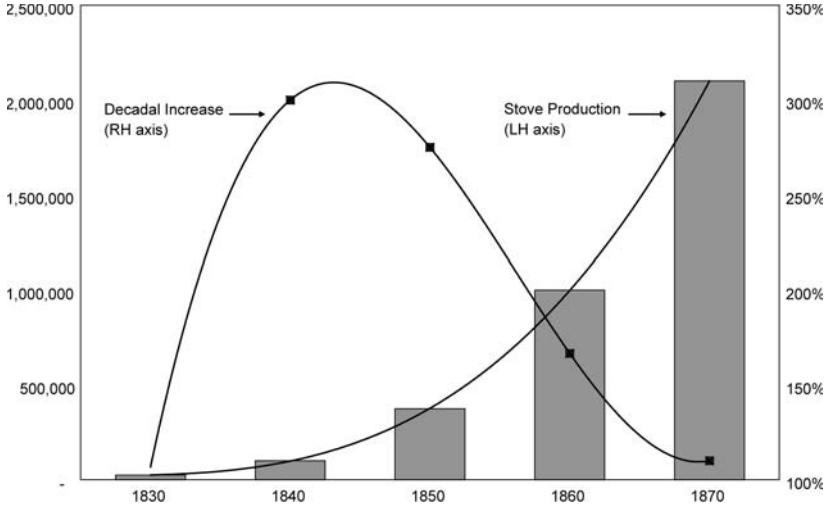

Figure 1. The output of stoves, 1830–1870: A contemporary estimate. Figures are for census years, not decadal totals. (Source: Jeremiah Dwyer, "Stoves and Heating Apparatus," in *One Hundred Years of American Commerce*, ed. Chauncey M. Depew [New York, 1895], vol. 2: ch. 51, p. 361.)

of growth.[19] The rising number of stove manufacturers in Albany and Troy, New York—the heart of the "Capital District"—is recorded in Figure 2. The District emerged as the new center of the industry because its uniquely favorable location at the head of tidal navigation on the Hudson and at the nexus of a growing canal system gave it inexpensive access to raw materials and to both the booming new western market and the established markets of the eastern seaboard. The opening of the Erie Canal in 1825, in particular, stimulated a wave of new business formation that continued, despite interruptions from the economic crises of the 1830s and 1840s, until it crested in the early 1850s. The foundations of firms that would lead the industry's growth through the 1870s, some of which would stay in business for decades longer, were laid during this period.

Another useful proxy for charting the rise of the stove industry is provided by the record of inventive activity. There had been a trickle of patents for heating and cooking appliances before the 1820s, but few were turned into saleable products—furnace operators' records barely mention them—and none had much impact on subsequent developments.

[19] Dwyer, "Stoves and Heating Apparatus," 361, offers figures for the 1840s and 1850s consistent with those cited in Victor S. Clark, *History of Manufactures in the United States*, vol. 1, *1607–1860* (Washington, D.C., 1929), 503–4.

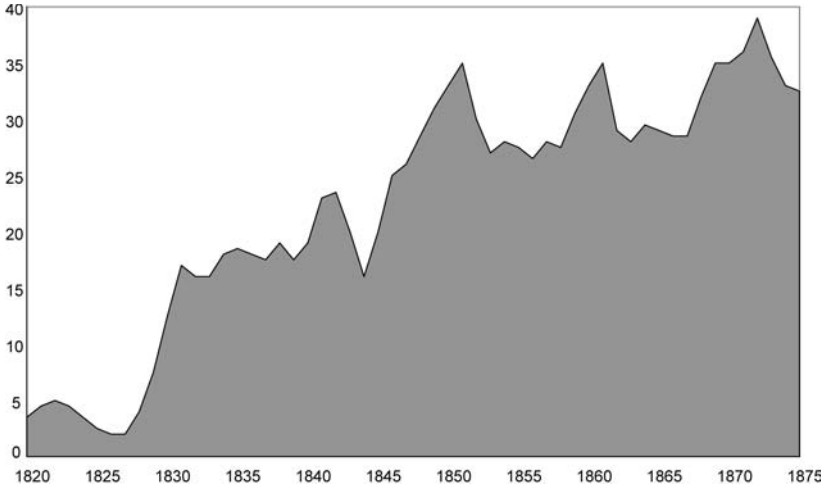

Figure 2. Stovemakers of Albany and Troy, N.Y.: Active firms, 1820–1875. (Sources: Tammis K. Groft, *Cast with Style: Nineteenth Century Cast Iron Stoves from the Albany Area* [Albany, 1984], 111–20; and John G. and Diana S. Waite, "Stovemakers of Troy, New York," *Antiques Magazine* [Jan. 1973], offprint.)

From the late 1820s through the mid-1830s, however, until the panic of 1837 interrupted the industry's growth, there was a surge of invention. (See Figure 3.) Much of this came from urban dealers and manufacturers, who were best placed to understand market expectations and what their competitors were doing, as well as from applied scientists, artisans, and others, who produced such an outpouring of stove patents that this category of products eventually comprised one-ninth of the entire volume of inventive activity recorded by the U.S. Patent Office. The panic killed the demand for stoves and thus stemmed the supply of new ideas, but when the economy boomed again in the mid-1840s, and stove production surged, patents once again increased in number, this time reaching nearly one-sixth of the U.S. total, counting patents for invention and the new category of design patents together.

This prodigious effort is evidence of the way in which a rapidly growing industry attracted entrepreneurial and other talents to try to satisfy some of the most basic needs of most American households and many businesses and public institutions, and (they hoped) to make their fortunes in the process. Many inventions were impractical, or derivative, or else their inventors were unable to overcome the hurdles they encountered on the path to achieving profitable production and sales. But among the successes were the foundation patents for generations of economical and efficient coal- and wood-fired cooking and heating stoves

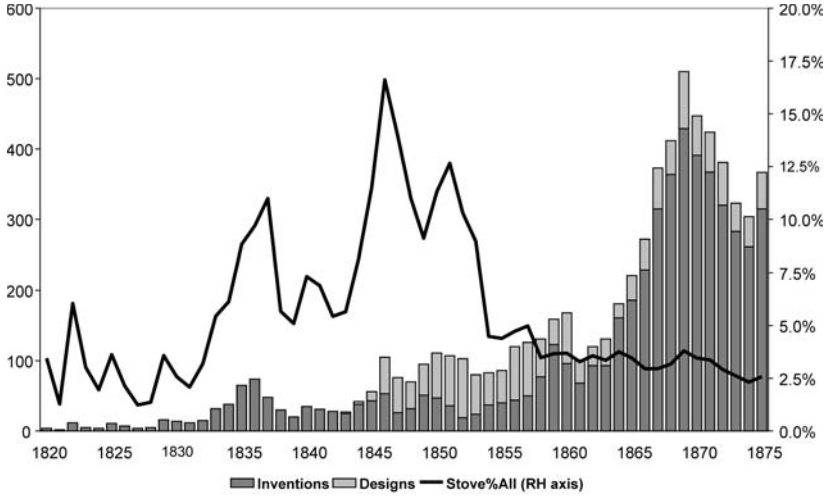

Figure 3. Inventive activity in heating and cooking appliances, 1820–1875. (Source: Database of c. 20,000 records, 1790–1920, compiled from the *Subject-Matter Index of Patents for Inventions Issued by the United States Patent Office From 1790 to 1873, Exclusive* [Washington, D.C., 1874] and the U.S. Patent and Trade Mark Office, Class 126 [Heating and Cooking Apparatus] invention patents, 1836 on, and design patents, 1843 on.)

and heating furnaces, which brought unprecedented levels of comfort and convenience to the American household. While they were imitated, pirated, modified, and improved over subsequent decades, they were not fundamentally changed.

* * *

Production was reorganized and relocated at the same time as the industry's product line developed. The men who pointed the industry toward its future, almost simultaneously but more or less independently of one another, were agents and offspring of the shift in its center of gravity toward the Hudson Valley corridor.

Jordan Mott (b. 1798), usually credited as a trailblazer in the industry's transformation, was a scion of a New York merchant elite family who had been forced to make his own way in the world when his father's fortune was wiped out in the financial crisis that occurred after the end of the War of 1812. Mott became first a grocer and then a coal dealer, helping to usher in the city's conversion to the efficient new fuel, Pennsylvania anthracite, which came onto the market in the late 1820s. In order to grow his business and, in particular, to create a demand for small sizes of broken coal that were sold cheaply because they did not

burn easily or well in existing appliances, Mott began, in about 1828, to develop effective cooking and heating stoves and open-fire grates that would utilize anthracite in this form. He took out numerous patents, pushed them into production, and defended them vigorously at law, using the profits of his mercantile business to underpin his new ventures.[20]

Mott's status as an outsider to the stove trade, free from the constraints of its customs, may help explain his innovativeness. As he reminisced a generation later, "I was looked upon by dealers of that day, as an interloper, I was so called, but few of them would commune with or deal with me." He also had a distinctive notion of the potential demand for a transformed product, which he envisioned as being not the narrow market that established producers served, but "the many." In stating his philosophy, he announced, "My object has ever been to make a stove that will meet the wants of the *mass* . . . not only economical and efficient, but so simple in management, that the girl who arrives from Europe one day may use it the next." However, Mott was not a "practical mechanic," so his first plan was to persuade existing firms to make goods according to his designs. But though he "offered the invention to some of the trade at their own or in fact without price, for a few years, . . . being unwilling to incur the expense of introducing a new article, or not appreciating its utilities, they declined to accept it upon any terms." So he had to make his stoves for himself. At first, he had his castings made the usual way: "at a blast furnace in Pennsylvania, rough and heavy." But when demand boomed in the mid-1830s, furnace operators advanced their prices, and Mott saw an opportunity to cut costs by bringing the work to New York.[21]

Another reason for the move was his complaint that furnacemen "would not manufacture from his patterns." Perhaps they could not: Mott had discovered by experiment a way to make his castings lighter, cheaper, *and* more durable by a fundamental redesign that reduced their thickness (previously equated with strength), and increased surface decoration both to improve structural integrity and to make the stoves more attractive to consumers. To achieve the quality he required, Mott had the castings molded in the city, contracting work out to jobbing foundries with versatile, skilled workforces, employing the relatively new British technology of the cupola furnace (which re-melted

[20] Benson J. Lossing, *History of New York City* (New York, 1884), 2: 707; Jordan L. Mott, *Description and Design of Mott's Patented Articles, Secured by 27 Patents* (New York, 1841).

[21] Jordan Mott to James R. Smith, 26 Nov. 1851, in New York State Legislature, *Documents of the Assembly of the State of New-York, 75th Session, 1852* (Albany, 1852), 7: 142, 145; Lossing, *History of New York City*, 2: 707.

pig iron and scrap, rather than smelting from the ore), and almost certainly casting in "flasks" (sand-filled wooden frames), rather than open sand. (Flask molding, already quite common at rural blast furnaces, would have been essential for the kind of heavily ornamented plates Mott wished to have cast.) The experiment worked: his castings came out "smooth and beautiful." Mott took the final step toward integrated production when he built his own foundry in 1839. Two years later, he built another, much larger, one on a new site. He had laid the foundation of a new family fortune, as well as of a new industry.[22]

Mott gained the pioneer's laurels at the time, but as with many good ideas it is difficult confidently to assign the prize for originality to any single person. This is not only because we are dependent on accounts that are partial and, at best, only roughly contemporary, but also because Mott and others were mostly just recombining existing practices.[23] They were adapting the common methods of the urban machinery foundry to the repetition production of consumer durables, rather than the custom manufacture of producers' goods, and applying hollowware molding techniques to larger, but simpler, shapes than pots, kettles, and pans.[24] They were responding to the inability of the blast-furnace production system to meet their demands for improved quality, lower cost, and reliable deliveries. And they were taking advantage of the improvement of water transportation and the resulting availability of an efficient, easily shipped new fuel—Pennsylvania anthracite—for their cupola furnaces and also for the steam engines that liberated the foundry from dependence on a waterpower site. Stove manufacturers could now afford to bring to the city the smaller quantities of pig iron and scrap, flux, and fuel needed for re-melting iron, rather than smelting from the ore. They could therefore concentrate previously separated manufacturing and distribution operations in the same place, easing problems of management and coordination, shortening links with suppliers and customers, and also, by being able to tap into well-supplied urban labor markets,

[22] J. Leander Bishop, *History of American Manufactures from 1608 to 1860* (Philadelphia, 1868), 2: 576–78; Lossing, *History of New York City*, 2: 707; "Jordan L. Mott Dies in 86th Year," *New York Times*, 27 July 1915, 9.

[23] See Edwin T. Freedley, *Philadelphia and Its Manufactures: A Hand-Book Exhibiting the Development, Variety, and Statistics of the Manufacturing Industry of Philadelphia in 1857* (Philadelphia, 1859), 97, 290–1; "Stove Trade Notes: William L. McDowell," *The Metal Worker* 47 (6 Mar. 1897): 41; Bishop, *History of American Manufactures*, 3: 290–92; David R. Meyer, *Networked Machinists: High-Technology Industries in Antebellum America* (Baltimore, 2006), 131–32. Meyer's recognition of the stove industry's importance is as welcome as it is unusual.

[24] John D. Tyler, "Technological Development: Agent of Change in Style and Form of Domestic Iron Castings," in *Technological Innovation and the Decorative Arts*, ed. Ian M. G. Quimby and Polly Anne Earl (Charlottesville, 1974), 151, 157, 158, 161.

escaping from the chronic difficulties faced by rural furnaces in recruiting and retaining skilled workers.[25]

At the same time as Mott was experimenting and then building New York City's first integrated stove works, entrepreneurs in Albany 150 miles north were doing much the same. Stove manufacturers in the Capital District, which was further from supplier blast furnaces, had done some of their own casting for years, or had it done for them by local foundries employing air furnaces, which were comparatively costly, inflexible, and inefficient melting devices. Then, in the mid- to late 1830s, a couple of these manufacturers, notably Joel Rathbone (b. 1806), reputedly the country's largest stove merchant, adopted the cupola, and, like Mott, began to make lighter, smoother, cheaper products as a result.[26]

Stovemakers in the interior were similarly innovative, or imitative. William Resor of Cincinnati, until then principally a tinsmith and dealer dependent on rural furnaces in the Ohio Valley for his stove castings, was inspired by a trip to New York that he made in 1837 to attempt to duplicate at home the quality of work he was able to buy there. He recruited a manager and skilled craftsmen from the East who worked out how to use the pig iron available locally, rather than depending on the imported Scotch pig iron that Eastern foundrymen believed was essential to their success.[27] That same year a Yankee tinner, Hudson Bridge, arrived in St. Louis, the emerging distribution center for the Mississippi Valley and the overland trade west. He started out selling Cincinnati and Louisville stoves, and then began to manufacture them with plates bought from Tennessee blast furnaces. In the early 1840s, he and his brother acquired a bankrupt foundry, bought some stove patterns, hired skilled men, and started making their own stoves. Like Mott's, Rath-

[25] George Rogers Taylor, *The Transportation Revolution, 1815–1860* (New York, 1951); Alfred D. Chandler Jr., "Anthracite Coal and the Beginnings of the Industrial Revolution in the United States," *Business History Review* 46 (Summer 1972): 159, 165; Walter R. Johnson, *Notes on the Use of Anthracite in the Manufacture of Iron* (Boston, 1841), 3.

[26] George R. Howell and Jonathan Tenney, eds., *Bi-Centennial History of Albany: History of the County of Albany, N.Y., from 1609 to 1886* (New York, 1886), 566–67. A.P., "Our State Institutions, XIV: The Albany Iron Foundries," *New York Times* 2 Jan. 1872, 5, says that Rathbone began to get his plates cast at an Albany air furnace in 1828, but *S. H. Ransom & Co., Manufacturers of Heating and Cooking Stoves, Portable Ranges, etc.* (Albany, 1874), broadside, gives 1838 as the crucial date when he erected his own foundry, "recognizing the necessity of an entire change in the method of manufacture," thereby agreeing with Bishop's *A History of American Manufactures*, 3: 241–42. Albert S. Bolles, *Industrial History of the United States: From the Earliest Settlements to the Present Time* (Norwich, Conn., 1881 ed.), 277, offers a slightly different chronology, and is explicit, though not necessarily correct, that Mott's success was Rathbone's inspiration.

[27] Charles Cist, *Cincinnati in 1841: Its Early Annals and Future Prospects* (Cincinnati, 1841), 245–47 and unpaginated advertisements; Chamberlain, "Death of William Resor" and "Obituary," in NASM, *Convention Proceedings* (24 June 1874): 113, 149.

bone's, and Resor's, the firm they established would remain one of the industry's major players until the First World War.[28]

* * *

These stories tell us a good deal about the reasons why the first generation of stove foundrymen would also be pioneers in marketing. The stove foundry was a new business type, and its creative entrepreneurs were directly connected with wholesale and retail markets even before they embarked on what would become the industry's core activity: casting, as well as designing and assembling, their stoves for themselves. The stove foundry was mostly a result of *backward* integration, displacing the blast furnace and tightening up the sector's decentralized, distended production system: its architects did not need to integrate forward into selling their goods, because that was *already* their business.

Competition and Product Differentiation

There was a further reason why these market-oriented entrepreneurs were so determined to take control of the entire production process. The way stoves were presented, sold to, and perceived by consumers changed radically in the 1830s. Before then, few stove manufacturers or dealers were in direct competition with one another, nor were many attempting to differentiate themselves and their products from those of other makers. Either their markets were too small and local, or their products were too similar and generic. But as the industry grew and transportation improved, local monopolies declined, and some fiercely competitive markets (especially New York, the biggest) were created, where manufacturers had to be able to distinguish their products from others' by price, quality, functionality, or reputation.[29] The major East Coast cities also provided some of the incentives and the means for them to do so: journals publicizing and assessing new inventions; mechanics'

[28] James Green, *Green's Saint Louis Directory (No. 1) for 1845* (St. Louis, 1844), 26; "The First Manufacturer of Stoves in St. Louis," *The Metal Worker* 3 (13 Mar. 1875): 3; "Semi-Centennial of the Bridge & Beach Manufacturing Company," *Stoves and Hardware* 9 (15 Jan. 1887): 14–15; Sherman S. Jewett, "President's Address," *The Metal Worker* 3 (12 June 1875): 3; Walter B. Stevens, *Centennial History of Missouri* (St. Louis, 1921), 53. W. G. Lyford, *The Western Address Directory* (Baltimore, 1837), 99, 143, 166, 218, 309, 331–32, 399–403, 423, details the beginnings of stove manufacture and sale by general foundries in the river towns from Pittsburgh to St. Louis—including Wheeling, Zanesville, and particularly Cincinnati.

[29] Edwin Williams, *New-York As It Is, in 1837* (New York, 1837), 106–7, records fifteen stove manufacturers and dealers, all situated within a few blocks of one another on the Lower East Side (mostly Water and Canal Streets); more are known to have existed. Mott's 1841 catalog is a product of the market leader's response to the resulting competitive challenge.

institutions offering awards for the best products; and trade shows providing yet more publicity and prizes by way of endorsement, as well as access to tens of thousands of visiting potential buyers.[30]

In this new environment, full of challenge and possibility, one of the most attractive strategies was to turn to the patent law. A new idea or feature for a stove could be translated into a unique selling proposition with a period (fourteen years in the first instance) of legally protected monopoly in its manufacture and sale, or the sale of the right to make and sell, often within a delimited territory (a state, county, or even city), thereby enabling an inventor to maximize his possibilities of income and to disseminate his product among widely scattered, noncompeting markets.[31]

William T. James, a Capital District inventor, had pointed the way to this future back in the late 'teens and early 1820s. His 1815 patent "saddlebag" stove (a Franklin adapted for cooking, with a small oven behind the fire and two "boiling holes," one on either side above it) was made on a large scale (five thousand sales were claimed by 1823) in the "factories" owned by James and his partner Cornell in New York, Boston, and Troy. Their stove was advertised extensively, and sold on the strength of its patent-protected features and its maker's name. What became of the partnership after 1823 is not known, but the product lived on as one of the staples of the trade for decades, endlessly pirated and finally becoming known generically as simply the "Baltimore cook."[32]

[30] Philadelphia's Franklin Institute, with its *Journal*, was the most important medium for the circulation of patent information, before *Scientific American* began, and it provided expert critiques as well as publicity and plaudits; see e.g. [Thomas P. Jones, the editor], "American Patents," *Journal of the Franklin Institute* 17 (Jan. 1836): 40, 45, 54, 56; "Seventh Annual Fair of the American Institute," *Mechanics' Magazine, and Register of Inventions and Improvements* 4 (25 Oct. 1834): 242. Other major regular trade exhibitions included those of the New York Mechanics' Institute (e.g. "First Annual Fair of the Mechanics' Institute," *Mechanics' Magazine* 6 [Nov. 1835]: 263), and, for New England, the Massachusetts Charitable Mechanic Association (e.g. *The Fourth Exhibition of the Massachusetts Charitable Mechanic Association, at Quincy Hall, in the City of Boston, September 16, 1844* [Boston, 1844], 44–47). Mott's 1841 catalog cited the ten awards and nine diplomas he had received from the American Institute since 1836, together with contented (high-status) customers' testimonials, in support of his claims on behalf of his products (*Description and Design*, 14–17), evidence of the value of these independent validating agencies in building buyer confidence in market-leading goods at a time when the product was developing fast and consumers lacked experience of it.

[31] Mott, *Description and Design*, 17, 31–32, emphasizes the role of his patents in Mott's competitive strategy.

[32] Edmund M. Blunt, *The American Coast Pilot* (New York, 1822), unpaginated advertisement; Howell and Tenney, *Bi-Centennial History of Albany*, 566. Unfortunately neither of James's patents (2296X of 1815, or 3854X of 1824) survived the 1836 Patent Office fire, but good examples of his stove live on in museum collections, notably at Old Sturbridge Village. Leibrandt & McDowell, *Philadelphia Stove Works and Hollow-Ware Foundries: Catalogue and Price List* (Philadelphia, 1861), 17, still included the James Cook (by name) in its product range.

Subsequent inventor-entrepreneurs took much better care of their intellectual property. The Reverend Dr. Eliphalet Nott, for example—president of Union College, Schenectady, and from 1829 of Rensselaer Institute, Troy, also—secured twenty-eight patents between 1819 and 1839, all but two of them between 1826 and 1835, when he, like Jordan Mott and several others, was focused on the problem of adapting and designing appliances to make the most efficient use of anthracite. Nott made sure to get the maximum value from his inventions by establishing a company in Albany in 1827, technically owned and run by his young sons but actually backed by his own money and Union College's (it was known variously as H. Nott & Co. and the Union Furnace), to manufacture and sell them, capitalizing on his name and national reputation as an orator and educator. The company succeeded handsomely until it went bankrupt in the panic of 1837, but even after that the sale of Nott's patent rights continued to net the college a good income for years.[33]

There was big money to be made from successful stove inventions by the 1830s. Henry Stanley of Poulteney, Vermont, for example, patented a (literally) revolutionary as well as prize-winning cooking stove, whose circular hot plate rotated on a pivot, enabling the cook to control cooking temperatures by moving the pots closer to, or further from, the center of the fire. Stanley manufactured these stoves himself and sold them through family-run agencies in New York, Philadelphia, and Baltimore, as well as licensing others to make and sell them in more remote markets for a royalty of five dollars per stove. The money did not roll in without effort: policing the patent took time and trouble. Stanley had to go all the way to the Supreme Court to collect his royalties on three thousand stoves one licensee, Emor Whipple of Cincinnati, had sold over three years after reneging on their deal when the validity of Stanley's patent came into question in 1836. But the labor seems to have been worthwhile. The stove commanded a premium price, and twenty years later it still found a market through dealers, and was sold and recognized by name.[34]

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[33] Harold C. Martin, "Nott, Eliphalet," 513, and "Nott Stoves," 523–24, in *Encyclopaedia of Union College History*, comp. and ed. Wayne Somers (Schenectady, 2003); John C. Spencer, *Argument in Defence of the Rev. Eliphalet Nott, D. D., President of Union College* (Albany, 1853), 63–64, 81, 84 and *Reply of the Trustees of Union College, to Charges Brought Before the Assembly of New York* (Albany, 1853), 88–90, detail the confused financing of Nott's enterprises.

[34] Stanley's key patents were 7333X, 1832, 9282X, 1835, and 91, 1836—their novelty is examined in "Decision of the Circuit Court of the United States, for the Eastern District of New York, in a patent case [Henry Stanley vs. Henry Hewitt] involving some important principles," *Journal of the Franklin Institute* 17 (Mar. 1836): 165–70; "First Annual Fair of the Mechanics Institute," *Mechanics' Magazine, and Register of Inventions and Improvements*

Thus, between the late 1820s and early 1840s, stoves were transformed from generic but costly products, made in fairly small numbers for narrow markets, into somewhat cheaper and better goods that were differentiated from one another by their makers' and model names, as well as by patent-protected features, and made in much larger volumes for broader markets. Heavy reliance on the patent system offered the infant industry a defense against any temptation to take the low road toward commodity production.

Stoves actually did become much more similar to one another, in terms of general appearance, layout, and functionality, as the product line matured and overall output boomed. This kind of "standardization via imitation" (the stove industry's version of Robert Allen's idea of "collective invention") meant that stoves became more satisfactory in performing their utilitarian tasks conventionally and efficiently, which helped overcome initial consumer resistance.[35] But at the same time they became *more* different from one another in design details, externals, and added features—on which competition and innovation came to concentrate.

After the passage of the 1842 Design Patents Act, which also required makers of patented goods to mark them with the patent date, it became possible to gain seven years' protection for a stove's outward shape and decoration as well as, or instead of, the existing fourteen years granted for an "improvement." Stovemakers made this law very much their own: they were responsible for four-fifths of all design patents issued in the 1840s and two-thirds in the 1850s. Unlike many other everyday goods, it was easy to cast the maker's and/or the model name, as well as the fact of being covered by patent, prominently and indelibly onto the surface of the stove itself. In this way, the name and the patent mark became key features of the stove's appearance, a permanent advertisement, and a deterrent, however imperfect, to counterfeiting.[36]

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6 (Nov. 1835): 293; Stanley v. Whipple [2 McLean 35, December Term 1839] in James B. Robb, comp., *A Collection of Patent Cases Decided in the Circuit and Supreme Courts of the United States* (Boston, 1854), 2: 1–10; Stanley & Co., *Remarks and Directions for using Stanley's Patented Rotary Cooking Stove* (Baltimore, 1834)—the first surviving manual for stove users; *The Worcester Almanac, Directory and Business Advertiser, for 1855* (Worcester, 1855), 23. For an entertaining and enlightening account of the purchase by a farm family of its first stove, a Stanley rotary, bought for $65 in Cincinnati, see T. M. Eddy ("Ronald, of Indiana"), "The Pioneer Cooking Stove," *The Ladies' Repository* 17 (Jan. 1857): 40.

[35] Robert C. Allen, "Collective Invention," *Journal of Economic Behavior and Organization* 1 (1983): 1–24.

[36] Henry L. Ellsworth, *A Digest of Patents, Issued by the United States, Including the Years 1839, 1840, and 1841* (Washington, D.C., 1842), xix–xx; figures as in Figure 2; H. Howson, "Proposed Remedial Alterations of, and Additions to, the Present Law Regulating the Grant of Letters Patent for Designs," *Journal of the Franklin Institute*, 3rd ser. 39, 69, no. 4 (Apr. 1860): 265–70.

Stovemakers strove to get the maximum value from all their inventive effort, not simply by vigorous patent management, but also by controlling, and profiting from, every stage of manufacture and sale. As stovemakers incorporated the foundry into their businesses, there was no longer much room for ironmasters to supply them. David Wood, for example, had a business relationship with veteran New York stove designer Charles Postley that lasted through the 1830s, even surviving Postley's bankruptcy. But in the new environment of the early 1840s, Wood finally came unstuck: Jordan Mott claimed that some of the patterns Postley got Wood to cast violated his patents. This was not hard for him to discover: their stores were next-door neighbors on Water Street. Wood responded that he did

> not consider it the duty of Furnace masters, when a pattern is sent to him to cast from—that he is bound to consult the Patent Office to know whether the castings are intended in any way to infringe on any other persons patents or not. Neither do I consider myself accountable in Law for making any castings from such patterns as any one may feel disposed to give me an order for.[37]

But by that time the old free-and-easy approach to intellectual property of the 1820s was well and truly over. The case dragged on from 1841 until 1846, requiring from Wood a great deal of attention and considerable expense, until it ended with a two-thousand-dollar judgment in Mott's favor. The outcome probably contributed to Wood's bankruptcy and loss of control of his furnace, which ceased producing stove plate and focused thereafter on gas and water pipe.[38] In this new litigious environment, the old furnace-based production system, and the network of relational contracts on which stovemaking had depended through the 1830s, finally died. Henceforth, the integrated manufacturer, defending his market position with an endless succession of minor patent-protected functional and design improvements, would rule the roost.

* * *

What has all this to do with the history of marketing? Plenty. Recall Porter and Livesay's description of the kinds of hardware that formed the stock in trade of the great wholesaling houses emerging at this time:

[37] David Wood to Messrs Mills & Taggart [attorneys], 6 Nov. 1841, in Millville Furnace: Jordan L. Mott Suit, 1841–46, David C. Wood papers, box 1.

[38] Millville Furnace Legal: Wood v. Postley, 1831–40 and Millville Furnace: Jordan L. Mott Suit, 1841–46, in David C. Wood papers, box 1. Postley's first stove patent, 2074X, dated back to 1814; his last, 3128, was taken out in 1843, i.e., his career spanned the entire first period of the industry.

"retail generic goods . . . produced or imported in large quantities, available from many sources, and relatively inexpensive per unit."[39] But stoves became much *more* superficially differentiated and *less* generic as time went on. The proliferation of types, models, and sizes that manufacturers produced in order to satisfy a heterogeneous market's complex needs meant that most individual stove models were produced in large batches, at best. Since stoves were a distinctively American product, there were no low-cost imports to sell in bulk. The strictures of patent law meant that some of the most attractive types were only safely available, at a premium, from the patentee or his licensees. And finally, stoves were also among the most costly and valuable items ordinary households would ever buy.[40] For all these reasons, the direction in which the industry and its products had developed would mean that the easy option—disposing of their output via wholesalers—would be closed to them, and that stove foundrymen, many of whose origins were in any case in the stove trade, rather than in stovemaking per se, would find themselves compelled, as well as inclined, to keep a firm grip on the sale and distribution of their goods while taking complete control of their design and manufacture.

Building Brands as Well as Stoves

A further development in strategy was one in which relatively few firms participated before the Civil War. However, since they included many companies that went on to become the industry's largest, most successful, long-lasting, and influential, it deserves attention. Some manufacturers began to build brand identities, rather than simply adding to their ever-lengthening lists of stove types, models, sizes, and patent-protected features. They seem to have appreciated the value of being able to sell customers a full line of stoves covered by a unifying

[39] Porter and Livesay, *Merchants and Manufacturers*, 35.

[40] The diversity of stove types and models is the clearest message of any stove catalog, a genre of publication which acquired a stable format in the early 1850s—e.g., *Rathbone & Kennedy, Stove Manufacturers* (Albany: Rathbone & Kennedy, 1854), http://pds.lib.harvard.edu/pds/view/2839128. In 1875, twenty-seven stove manufacturers of Albany and Troy and 150 NASM members, who also reported, each produced on average thirty-two named models, implying a mean annual output of c.300 to 350 stoves per model. "Albany and Troy Stoves: Alphabetical Index of Manufacturers, and of the Stoves Made By Them," *The Metal Worker* 3 (22 May 1875): 3; "New Publications: Josiah Jewett [Sec.], *Names of Stoves, Ranges and Furnaces*," *The Metal Worker* 6 (2 Dec. 1876): 6; output estimates computed from Thomas Dunlap, comp. and ed., *Wiley's American Iron Trade Manual* (New York, 1874), 335–52. Aggregate output, of firms and the industry as a whole, was large, in terms of units made and sold; but this kind of mass consumption does *not* imply mass production, as conventionally understood. See Philip Scranton, *Endless Novelty: Specialty Production and American Industrialization, 1865–1925* (Princeton, 1997).

brand name that conveyed a promise of common quality. Jewett & Root of Buffalo, for example, had certainly done this by the early 1850s, thereby establishing "Jewett" as the oldest trademark in the business. In 1853 the company advertised that its stoves were "all . . . got up by us," and that "the style of Stoves, their originality of design, the quality of our wares, unite in giving them a high character, which we are determined to maintain at any expense."[41]

Another of the oldest trademarks, Charter Oak, started as the name that Giles Franklin Filley, owner of Excelsior Stove Works of St. Louis, gave to a cooking stove that he patented and introduced in 1852 and that eventually became its greatest success. Filley (b. 1815), who was a member of a family of Connecticut tinsmiths and merchants, followed an older brother, Oliver Dwight, and the family's long-distance peddling network, to St. Louis in 1834. He worked in his brother's tinware shop until 1841, first as apprentice, later as partner, and then in his own business, making and selling earthenware (a complementary but noncompetitive product line). In 1849, a year of disasters in St. Louis (the Great Fire and a cholera epidemic) but also opportunity (the California Gold Rush, resulting in a flood of travelers heading west), he sold out to cousins and moved his capital into the growing stove trade. After building his own foundry, he went back east to Troy, where his uncle Augustus had run a branch of the family tinware business, to recruit skilled workmen and gather stove patterns.[42]

At first, Giles's stove-naming habits were uninspired: the St. Louis Air-Tight was his leading product. However, the name he chose for his venture, Excelsior, proclaimed itself as a fragment of New York skill and enterprise transplanted to the heart of the Mississippi Valley, and also as an aspiration to excellence. The "Charter Oak" name similarly emphasized his product's New England roots, as it referred to the ancient tree in Hartford, capital of Filley's home state, in which the colony's charter had been hidden and protected from royal authority in the 1680s during King James II's attack on his American subjects' liberties. It was a popular patriotic symbol of solid, enduring, Yankee virtue.[43]

[41] "Trade Marks," NASM *Proceedings* 34 (11 May 1905): 234; *1853: The Commercial Advertiser Directory for the City of Buffalo* (Buffalo, 1853), 72.

[42] Jacob N. Taylor and M. O. Crooks, *Sketch Book of St. Louis* (St. Louis, 1858), 6, 75, 77, 82, 88–89, 326, 391; J. A. Dacus and James W. Buel, *A Tour of St. Louis* (St. Louis, 1878), 231–34; John F. Darby, *Personal Recollections* (St. Louis, 1880), 429–30, 434, 443–44; Rutherford Hayner, *Troy and Rensselaer County New York: A History* (New York, 1925), 3: 179; Randy Baehr, "Giles F. Filley: A Brief Biography (1995)," online, http://home.earthlink.net/~turnerbrigade/filley.htm, Donald G. Southerton, *The Filleys: Three Hundred Fifty Years of American Entrepreneurial Spirit* (Lincoln, Neb., 2005), 63, 69–70, 83–86.

[43] R. Butcher advertisement, *Galena City Directory, 1854* (Galena, 1854), 32; Gayle B. Samuels, *Enduring Roots: Encounters with Trees, History, and the American Landscape* (New Brunswick, N.J., 1999), ch. 1.

Like the name Excelsior, it created associations between the products of his newly established business on the manufacturing frontier and the East Coast stovemakers' reputation for quality. But probably more important than either the model or the company names was the simple fact that Filley's design innovations significantly improved his stoves' performance. He raised his output by 50 percent from 1852 to 1853, and Charter Oaks made up about a quarter of the total in the firm's first year alone. Continuing rapid growth through the 1850s forced him to add repeatedly to his production capacity as the Charter Oak contributed an increasing share of his booming trade.

In the beginning, Filley treated the Charter Oak as just another model name and pattern. He attempted to defray his product development costs by the common practice of selling to other manufacturers the right to make and sell the stoves in markets in which he did not intend to compete. However, the name rapidly became what we would now recognize as a brand, which could be continued through a succession of improved models and extend its aura of quality to other new products. On the back of his brand-building, Excelsior rose to become the largest firm in the industry by the early 1870s. Filley went to court repeatedly to defend the Charter Oak against imitators; by so doing, he helped to lay the foundations of U.S. trademark law. When Excelsior went bankrupt in 1896 and Giles and his sons lost control, the brand lived on: reborn as the Charter Oak Stove Co., the St. Louis stove foundry stayed in the business until the Great Depression finally closed its doors.[44]

* * *

Brand-building was a strategy that only a few of the industry's larger firms could attempt. Size and determination were required to produce a full product line like that created by Jewett & Root. Or, on the other hand, firms needed an original, distinctive, and winning design, like Giles Filley's, which could serve as the foundation for an ever-broadening product family. But if a firm possessed or managed to acquire these assets, it gained the nearest thing to first-mover advantages that the stove industry provided. The firms that built brands, encapsulated in trademarks, rather than simply constructing stoves bearing one of the bewildering variety of names by which stovemakers designated their many models, were by the end of the 1860s among the industry's

[44] "Supreme Court of Missouri. Giles F. Filley, Respondent, v. A. D. Fassett et al., Appellants [Filley v. Fassett]," *American Law Register* 17 (July 1869): 402–11; "Big Failure in St. Louis," *New York Times*, 7 Feb. 1896, 8; "Charter Oak Stove and Range Company's Jubilee," *Atlanta Constitution*, 19 Nov. 1899, 17.

leading and enduring players and the strategic models for the midwestern upstarts that became their rivals in the next generation.[45]

But most stovemakers, even by the end of the period considered here, were too small, too limited in design, manufacturing, and managerial capacity, and simply too short-lived to pursue long-term strategies of any kind. In the New York Capital District, for example, which was responsible for between a fifth and a quarter of production capacity by the early 1870s, the median life expectancy of the 250 firms founded over the previous half-century was about three years (mean: five years), before they went out of business or, at the least, were forced by a change of partners to adopt a new name. There was no clear trend toward increasing stability and longevity as the industry matured.[46] Thus the best that most stovemakers could manage, in a very competitive nationwide industry composed of a circulating population of a couple of hundred participant firms, was to keep a close eye on costs and quality, engage in product differentiation, either through the patent system or in other ways, and then market their goods—hard.

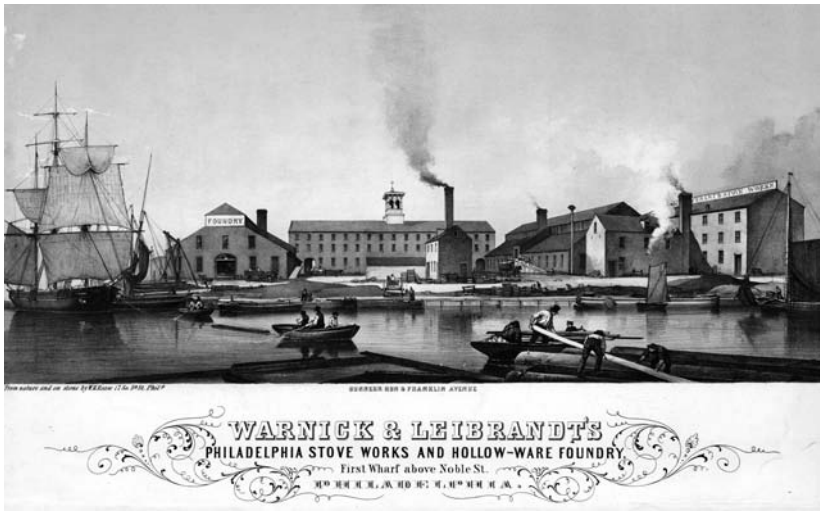
Stove Foundrymen Develop as Stove Merchants

Stove foundrymen, partly because of the merchant background many of them shared, but also because, initially, local markets were most important to them, often conducted a retail as well as a wholesale business, either from their works or from a downtown shop. The most convenient locations for foundries were underpopulated waterfronts, where heavy raw materials could be shipped in most easily and cheaply and real estate was inexpensive. (See lithograph.) Salesrooms, on the other hand, were best situated on streets thronging with commerce but also reasonably close to the waterfront, because stoves, too, needed to be shipped into or out of the city. New York, Philadelphia, and Boston quickly acquired "stove districts" that met these locational requirements, and that lasted into the early twentieth century: on Water Street on the Lower East Side, along Second Street near the Delaware River, and on Union Street, respectively.

Customers could easily compare prices and products within a few blocks, and stovemakers could keep abreast of the competition and the market's requirements, simply by walking from store to store to look and talk, buy or sell. Retail trade had much to recommend it. Particularly

[45] Conclusion based on comparing firms with pre–Civil War trademarks in "Trade Marks," NASM *Proceedings* 34 (11 May 1905), 231–37, with data on the size distribution of firms in the early 1870s from *Wiley's American Iron Trade Manual*, 335–52, and on firm survival and influence within the industry from the *Proceedings* of the NASM from 1872 until 1915.

[46] Waite and Waite, "Stovemakers of Troy" and Groft, *Cast with Style*, 111–20.



The Philadelphia Stove Works and Hollow-ware Foundry. Lithograph by W. H. Rease, 1850. (Source: Accession No. P.2267, The Library Company of Philadelphia.)

appealing was the fact that (in major towns and cities) it was largely a cash or short-credit business, so the chronic cash-flow problems encountered in the industry would be eased for a stove foundry with its own store. Sometimes direct contact with the final consumer was essential: a new, profitable, high-value product for middle-class and institutional buyers coming into the market in the 1840s was the hot-air furnace, which needed a customized installation and after-sales service.[47]

But however lucrative it was, the retail business—even of New York, Philadelphia, Boston, or Baltimore and their immediate hinterlands—could not have sustained the industry's growth and the concentration of production in a comparatively few urban centers that occurred by mid-century. Most northern consumers, and the largest untapped stove-marketing opportunities, were to be found in rural America, particularly in the great arc of Yankee and immigrant settlement sweeping across western New York State and progressing as far as the Midwest. There were also the consumers of Atlantic and Gulf Coast towns and cities to cater to, and after the Gold Rush, there was California as well.

[47] The best source for understanding the city retail trade, albeit a generation later, is the correspondence from managers of Marcus Filley's Water Street store to Filley and others in the home office at the Green Island Stove Works in Troy, in the Filley papers at the New York State Library, Albany [hereafter NYSL], box 16, folders 1–2 esp. (1873), and 11, folders 4–11 esp. (1881), plus a scattering throughout; and at Rensselaer Polytechnic, Troy, boxes 2–3 (1869–70 and 1881).

To reach these customers, the stove districts of Water Street and Second Street, or River Street in Troy, fulfilled another need. Stores doubled as warehouses and display rooms where country retailers and inland stove jobbers could inspect goods and place their orders on their annual or semiannual buying trips to the big city. These were serious affairs: according to John B. Jones, writing in 1849, the "western merchant" (his experience was in Missouri) could expect to spend "one-fourth of his life . . . traveling to and from the east."[48] They went where they could expect the largest ranges and stocks of goods, the best prices, and the most favorable terms. Edwin Freedley exulted in 1859 over Philadelphia's advantages as a pilgrimage destination: "a purchaser of a miscellaneous stock, adapted to the wants of a rural, town or city population, must be, when in Philadelphia, as near the fountain head . . . as it is possible for him to get."[49] The merchants of Water Street had further advantages, notably the low freight costs their New York location gave them, and the fact that major Albany, Troy, and other Hudson Valley manufacturers opened their own city stores, too, thus enabling visiting buyers to deal with a large proportion of the state's (and the nation's) stove industry without having to travel upriver.

Store managers acted as shipping and insurance agents, securing the best deals on transportation and liaising with city-based providers of the other business services (metal brokers, banks, attorneys, patent agents, credit-reference services) on which the stove trade's spreading commercial networks increasingly depended. The foundries concentrated on making, the stores on selling. Partners and officers within stove foundries, too, began to specialize by function, depending on whether they focused on the "inside" or the "outside" of the business. Sometimes the two operations were not spatially separated: foundries often maintained "warerooms" as well as warehouses at their plants, conducted a profitable retail and "repair" (spare-part) trade locally and by correspondence, and welcomed trade visitors. But in terms of the language, customs, and management structure of the trade, the distinction between making and selling, the "inside" (the pattern, foundry, and mounting shops) and the "outside" (the market, the suppliers, and the competition), became entrenched.

To look at only the makers' end of the distribution chain is to consider just half of the story. Equally as important to the development of a nationwide stove market was the fact that there were traders in the hinterland who were eager to become stove foundrymen's customers and

[48] Jones [Luke Shortfield, pseud.], *The Western Merchant: A Narrative* (Philadelphia, 1849), vi.

[49] Freedley, *Philadelphia and Its Manufactures*, 97.

to find buyers for their stoves. This reflected the general process from the 1830s onward of the emergence of specialized retailers, who replaced country stores in the rural market's growing commercial centers.[50] The stove industry's retailer clients were largely recruited from one particular group of traders and artisans: traveling tinsmiths and tinware or hardware peddlers who put down roots and opened shops. For hardware and tinware, they relied on wholesalers, and when some of them began to deal in stoves—a new, profitable, and closely connected product line—they looked toward local jobbers and more distant manufacturers to meet their needs.[51]

The emergence of the far end of the distribution chain is a more elusive subject than the beginnings of major urban stove foundries. While both ends of the chain are equally lacking in firm-level primary-sources, there are far fewer good, near-contemporary substitutes—biographical studies or obituaries of major entrepreneurs—to compensate for the sparseness of materials on the distribution network. However, it is possible to track its development through a close reading of mid-century commercial directories. From the early 1840s onward, the directories for towns and cities in the Northeast listed more stove dealers, even in small towns, than those published for major cities in the 1820s or early 1830s.[52] And by the 1850s, even midwestern states barely but rapidly emerging from frontier conditions began to look the same. In Wisconsin in 1853, for example, Beloit and Fond du Lac, with populations of about three thousand to four thousand, supported three stove and tinware stores apiece; even tiny Lancaster, with just four hundred people, had two. The region's stove-distribution system improved markedly in that decade as railroads developed to complement the river, canal, and lake network on which the industry still depended. By the start of the Civil War, the entire region was saturated with stove and tinware dealers, so that no consumer was far from a source of supply, and most communities of any size were offered a choice. The larger (brand-name) manufacturers—for example, Rathbone & Sard of Albany—began to respond by negotiating sole-agency contracts with just one dealer in every major town, protecting the dealer (and their goods) against exact, like-

[50] See Martin Bruegel, *Farm, Shop, Landing: The Rise of a Market Society in the Hudson Valley, 1780–1860* (Durham, N.C., 2002), 164; Timothy R. Mahoney, *River Towns in the Great West: The Structure of Provincial Urbanization* (New York, 2003), 209, 211–12.

[51] Elva Tooker, *Nathan Trotter, Philadelphia Merchant, 1787–1853* (Cambridge, Mass., 1955), 114–24.

[52] Cf. Charles Varle, *A Complete View of Baltimore* (Baltimore, 1833), 161 with *The Massachusetts State Record and Year Book of General Information, 1848*, vol. 2, ed. Nahum Capen (Boston, 1848), 215. *The New York Mercantile Union Business Directory for 1850–51* (New York, 1850), 364–66, 384–87, describes a state with stove and tinware dealers everywhere. See also *W.W. Reilly & Co.'s Ohio State Business Directory for 1853–4* (Cincinnati, 1853), 374–76.

for-like competition and acquiring a local collaborator with an interest in pushing their particular goods, rather than just growing his own trade.[53]

Manufacturer-wholesalers and their retail customers well understood their mutual interdependence. Tinware dealers formed a necessary and natural link in the chain from maker to consumer. Even when stoves became light enough, and the transport network efficient enough, to allow them to be shipped a long way without a prohibitive markup, and to be delivered almost anywhere packed and ready to be assembled, stoves still required specialized dealer services to get them into salable condition—polishing to cover up rust and scratches suffered en route; fitting the most fragile and easily damaged pieces, which were transported separately; identifying breakages; and making repairs. Tinsmiths, with their metal-working skills and tools, were ideally suited to these tasks, and they already sold the kitchen utensils customers were likely to buy at the same time as a stove itself. They were also able to manufacture and install the iron flue pipes connecting a stove to an existing chimney or permitting the customer to do without any chimney at all. The tinsmiths could also construct and fit the hot-air ducts essential for furnace users.

Because stoves were comparatively expensive goods, they had to be displayed attractively, demonstrated, and sold by face-to-face persuasion as well as by regular advertising in the local press. To enable rural customers to afford them, a sale would generally require a long credit period and sometimes barter or trade-in arrangements. Stoves also represented a new technology: few customers knew as little about it as the Georgia farmers in the industry's last frontier, the post–Civil War southern up-country, who had to be told to light their fire *inside* the stove's firebox, rather than on the stone hearth underneath it. Catering to them represented just an extreme case of the kind of after-sales support only a local retailer could offer.[54] Much more common were spare-part and repair services: customers would not entrust basic household tasks—and, in midwinter, their sheer survival—to a new technology without the confidence that breakdowns could be quickly remedied. This confidence depended partly on the retailer, partly on the

[53] John W. Hunt, *Wisconsin Gazetteer* (Madison, 1853), 49, 247, 127; E. J. Montague, *A Directory, Business Mirror, and Historical Sketches of Alton County* (Alton, Ill., 1859), 120, 137, 157, 159, 161, 163, 166; Charles F. Clark, *Michigan State Gazetteer and Business Directory for 1863–4* (Detroit, 1863); James D. Johnston & Co., *Johnston's Detroit City Directory and Advertising Gazetteer of Michigan* (Detroit, 1861), 336.

[54] D. L. Fullerton (Augusta, Ga.) to Marcus L. Filley, 24 Nov. 1868, box 6, folder 3, NYSL. The antebellum South had few stove dealers or users outside of its coastal and river cities, and even there the distribution network by the 1850s was barely comparable to that in the Northeast a generation earlier. See John P. Campbell, *The Southern Business Directory and General Commercial Advertiser,* vol. 1 (Charleston, S.C., 1854); *Nashville City and Business Directory, for 1860–61,* vol. 5 (Nashville, 1860).

manufacturer's readiness to stock and supply spares for years, even after a stove went out of production, and partly on the U.S. Postal Service and the private express companies that facilitated the rapid movement of information, payments, and relatively small or high-value, time-sensitive consignments.[55]

Understanding the emergence of a mass market for stoves right across the northern states, and even as far as the Pacific Coast by the end of the 1850s, requires us to appreciate that, to contemporaries, "the trade" necessarily embraced everybody from the "Stove Kings" of Troy right down to the local tinner.[56] Of course, tensions arose among its constituent elements, bound together by long credits and relational contracts, yet divided by the ceaseless struggle to appropriate the lion's share of the difference between manufacturing cost and final sales price. But the language of a trade community was not mere rhetoric. This was particularly the case because many of the entrepreneurs of major new stove foundries continued to emerge from the retail trade right through the later nineteenth century. The process by which merchants incorporated manufacture into their businesses was endlessly repeated as the industry gradually moved away from the Hudson-Mohawk axis and closer to its midwestern and southern consumers.[57]

* * *

The final links in the chain between maker and seller were devised in the late 1840s and early 1850s, and they were both designed to cope with the increase in the geographic extent of the market, in the number and remoteness of the retail outlets requiring to be serviced, and in the severity of competition among rival stove foundrymen.

The first innovation occurred in the context of the cyclical downturn in the market in the late 1840s, at a time when new stove foundries were springing up in the river cities of the interior (notably St. Louis, Cincinnati, and Louisville), replicating the industry's existing trade practices and offering local merchants a shorter buying trip, instead of the usual pilgrimage east. At some point, one of the more enterprising Troy stovemakers decided not to wait for his customers to come to him

[55] As early as 1841, Jordan Mott promised to keep old patterns in his inventory so that he could always supply replacement parts even for discontinued models, giving buyers confidence to invest in goods which, with care and repair, could last a generation; *Description and Design*, 22.

[56] D. S. Cutter & Co., *Sacramento City Directory for the Year A.D. 1860* (Sacramento, 1859); John S. Hittell, *The Resources of California* (San Francisco, 1863), 400; "Aleph," "The Stove Business: A Look through the Foundries of Troy, N.Y.—Their Factors in Chicago," *Chicago Tribune*, 28 Sept. 1867, 4.

[57] For stovemakers in Detroit, see James J. Mitchell, *Detroit in History and Commerce* (Detroit, 1891), 40–44.

from this increasingly diffuse market, but instead hit the road to go to them. As an industry veteran reminisced thirty years later, this nameless pioneer "went out and sold his stoves, and came back and filled his orders. He succeeded remarkably well."[58]

In this most competitive and imitative business, where one led everybody else felt compelled to follow. The traveling salesman or "stove drummer" turned out to be such a useful and versatile, if costly and sometimes problematic, link between manufacturer and retailer that, despite endless complaints from the more traditionally minded manufacturers, who wished their customers would continue to come to them, travelers' numbers only grew. By the start of the Civil War, there were so many of these drummers that they even rated a mention in the 1862 Revenue Act, which imposed a federal excise tax on peddlers. "Manufacturers and producers of agricultural tools and implements, garden seeds, stoves and hollow-ware, brooms, wooden ware, and powder, delivering and selling at wholesale any of said articles, by themselves or their authorized agents at places other than the place of manufacture," were not "required, for any sale thus made, to take out any additional license." They already paid federal taxes under the Act (to engage in business, and on their total sales), so they should not be taxed again. Thus, the federal government had recognized that some manufacturers, generally those satisfying a decentralized, nonurban demand, had integrated forward into distribution and marketing. Among this select list of innovators, the stove industry ranked high.[59]

The second development, which took place a little later, only involved the larger firms and was less significant: the creation of "branch houses" in emerging regional distribution centers (notably Chicago, heart of the midwestern railway network but without much of a stove-manufacturing industry of its own). This seemed like an innovation to contemporaries, but, with the perspective of 150 years, it is clear that all that was taking place was the re-creation, at a longer distance and on a much larger scale, of the kind of relation between, for example, a Hudson Valley foundry and its Water Street wareroom that had been common since the 1830s.[60]

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[58] William H. Whitehead in *NASM* 6 (17 Jan. 1877): 63, 64.

[59] "Excise Tax," *Merchants' Magazine and Commercial Review* 47 (1862): 252.

[60] Newberry, Filley, & Wiswell [the junior partner]'s "Troy Stove Store" advertised in E. H. Hall, *1855–6: The Chicago Directory, and Business Advertiser* (Chicago, 1855), 116, along with three other Eastern branch houses including Jewett & Root (Buffalo) and Treadwell, Perry & Norton (Albany). There were also at least thirteen local dealers, but only one stove foundry, for a city of eighty thousand people.

Decisions to take these further steps to close the gap between maker and market seem to have come readily to stovemakers. Hardware wholesalers and a range of specialized metal-products manufacturers were, after all, doing much the same thing at the same time, so there were plenty of precedents from which to draw. The life stories of first-generation stovemakers also often highlight periods of itinerancy in their early careers, particularly among those with a background in the tinner's trade. So taking to the road, whether to drum up new business or to attempt to collect outstanding debts, was an obvious response to market stringency.

Stove drummers were recruited from among younger family members, ambitious clerks and skilled workmen, and experienced retailers and tinsmiths. They had to know the business, have the confidence of its principals, and understand the product and the market. Unlike many other travelers, they were spared the trouble of carrying samples, because their goods were too heavy, and they were therefore not tied to commercial hotels or hired display rooms in the towns they visited. They traveled light, carrying trade gossip, catalogs, and not much else, visiting retailers in their own premises. They took and forwarded orders, made reports and on-the-spot decisions about creditworthiness, collected bills (if they could), and deducted their expenses from any cash payments before forwarding the rest. They gave retailers point-of-sale support: advice on products' "selling points," effective sales patter, attractive display techniques, and "knocking copy" about rival products. They helped with local advertising, both by supplying printed material for the merchant to distribute or stereotype plates for him to use in printing his own publications, and by, for example, staging competitive open-air cookery demonstrations at county fairs, stunts combining popular entertainment with customer "education." They dealt with customer complaints. And they kept the foundry well acquainted with how the products were performing for the customers, what problems needed fixing, and what the competition was offering. Without intending to, stovemakers had thus acquired an invaluable way of gaining the market intelligence that was so critical in a competitive, continuously innovating, and increasingly style-dependent business.[61]

[61] Summarized from correspondence with traveling salesmen in the Filley papers, notably Ira J. Wood (Midwest and Texas, esp. 1864–1872) and George Meriwether (Texas, principally 1879–1881); Minute Book, Detroit Stove Works, 1866–1894, Detroit Public Library; Minutes of the Meetings of the Board of Directors of the Reading Stove Works, Orr, Painter & Co., 1891–1903, Accession 1828, Hagley Museum and Library; extensive reading of the trade press (*The Metal Worker* and *Stoves and Hardware*) for the 1870s to 1900s; and comprehensive study of the NASM *Proceedings*, 1872 to 1915. Most of this evidence is post–Civil War, but the little that is available for the 1850s points to a basic continuity. See also Timothy B.

Conclusion

By the start of the Civil War, the stove industry's structure and organization, product line, and distribution system had been transformed through a long generation of headlong growth, which continued until the depression of the 1870s and then ground almost to a halt. For the next half-century, as the industry encountered a mature market and faced increased competition from new fuels (manufactured and natural gas, petroleum, and eventually electricity) and the appliances devised to use them, and the resulting chronic problems of cyclical overcapacity and low profitability, it became a site of continuity rather than innovation in business practices. New firms still entered the industry, especially in new producing regions (the Midwest and upper South), but they usually replicated the structure and strategies of the ones already present. There was little business consolidation, and the industry continued to include a couple of hundred firms, none of which enjoyed significant market power. Stovemakers held to the strategy of model proliferation and continuous superficial innovation that had emerged in the 1840s, and by the 1870s led to the introduction of regular annual styling changes. Their aim was to maximize market coverage, minimize competition on price alone, and stimulate replacement-stove sales at a faster rate than breakdowns and obsolescence alone could guarantee.[62] The larger firms also invested in the development and defense of strong brands, which they came to consider their greatest assets, and some began to engage in direct consumer advertising. But all firms increased their sales efforts, using essentially the same palette of techniques developed by the 1850s: a marketing strategy concentrated on the retail dealer rather than the final customer, relying on traveling salesmen, and, among the larger firms, branch-house networks.

Continuity, failure to adapt to competition, and relative and then absolute decline, raise interesting questions for the historian of an industry whose forty-year growth phase had been so markedly innovative. But one of the consequences of the timing of its innovations is that the industry seems to have become almost invisible, even to the historians who have contributed the most to our understanding of the development

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Spears, *One Hundred Years on the Road: The Traveling Salesman in American Culture* (New Haven, 1995); Strasser, *Satisfaction Guaranteed*, 61–63; and especially Walter A. Friedman, *Birth of a Salesman: The Transformation of Selling in America* (Cambridge, Mass., 2004), ch. 3.

[62] Howell J. Harris, "'The Stove Trade Needs Change Continually': Designing the First Mass-Market Consumer Durable, c.1830–1900," *Winterthur Portfolio*, forthcoming, preprint at http://www.dur.ac.uk/h.j.harris/stoves/0804-Designing_Stoves.pdf

of marketing. These innovations occurred during a period when, according to those operating within the framework of the Chandler paradigm, nothing much is supposed to have happened. Everything I have described in this article took place in Richard Tedlow's "era of market fragmentation," dictated by "the absence of a transportation and communication infrastructure spanning the continent." But this does not seem to have barred Albany and Troy stovemakers, for example, from profitably selling their costly durable products weighing upward of two hundredweight to customers several hundred (in the 1820s) or even (from the 1840s) thousands of miles distant. "National brands" may indeed have been "few in number," but Eliphalet Nott achieved *international* name recognition and sales by the early 1830s, though the first real national stove brands only emerged in the 1850s. Anybody reading print media from midcentury onward can only conclude that stovemakers' brand-building efforts were sustained and successful. This may have been "an era of vertical and horizontal nonintegration," but the stove industry had found its own way toward vertical integration by the end of the 1830s and demonstrated thereafter an ability to build and sustain nationwide marketing and service networks incorporating hundreds, eventually thousands, of other independent businesses at the far end of the distribution chain. "Firms" in general may have been "small, and exercised limited control over the market," but what does "small" mean? By the 1870s, the largest stovemakers were heavily capitalized, had workforces in the several hundreds, and achieved annual output figures of around fifty thousand units of diversified products. Although they could not control the overall market for stoves, they were certainly able to pursue deliberate strategies for protecting their own market share. Average-sized firms employed about a hundred workers and produced around ten thousand units a year. Only by comparison with a later generation's corporations could the industry's constituents be considered small, powerless, or managerially unsophisticated. Their principal business strategy was not "to make profits by charging high prices and thus making high margins but at the expense of low volume." Instead they set out to find a balance point between a (falling) price level, enabling them to achieve universal market penetration, and the cost of a host of features other than price that they considered equally essential for transforming stoves into objects bought as consumption items, on grounds of their style, and even beauty, as well as their functional utility. The result was that they achieved mass consumption and a nationwide market *without* standardization. They also made their major and distinctive material contribution to the "American way of life" without participating in building the "American system of mass production," conventionally

assumed to be a precondition for the construction of an economy of abundance.[63]

The very clarity of Tedlow's stage theory of growth and institutional change turns his work into a useful foil for my presentation of an alternative reality. Other marketing historians' versions are less explicit, more nuanced, but generally similar. My aim in exploring and setting out this neglected but far from trivial exception to the Chandlerian rule is not especially revisionist: Walter Friedman, Pamela Laird, Susan Strasser, Richard Tedlow, and indeed Alfred Chandler himself were surely essentially correct in their emphases and explanations. It is, rather, to fill in a gap in our knowledge and understanding, to complicate matters slightly, and in particular to offer another reminder of the creative and adaptive capabilities of entrepreneurial businesses and personal or family capitalism in an era too easily written off, or skipped over, as merely a preface to modernity.

[63] Tedlow, *New and Improved*, 5. Luke Hebert, *The Engineer's and Mechanic's Encyclopaedia* (London, 1836), 1: 535, illustrates the impact of Nott's stoves in the United Kingdom, where Nott made sure to have his patent registered ("List of New Patents Sealed in 1830," *Mechanics' Magazine* [London] 424 (24 Sept. 1831): 477). Walter W. Powell, "Neither Market nor Hierarchy: Network Forms of Organization," in *Research in Organizational Behavior* 12, ed. B. M. Staw and L. L. Cummings (Greenwich, Conn., 1990), 295–336. John R. Chapin, *The Historical Picture Gallery of Scenes and Incidents in American History*, vol. 5 (Boston, 1856), an advertising compendium, contains major stovemakers' entries at pp. 17, 265, 266, 270, 273, 274.