CULTURAL FACTORS IN THE PERSISTENCE OF HAND TECHNOLOGY IN LANCASTER, PENNSYLVANIA

The contention that the rise of the factory system decimated the ranks of artisans and craftsmen and shattered their common culture and consciousness is rather commonplace—whether noted a half century ago by Norman Ware or recently by Susan Hirsch.

No doubt inspired by the work of E. Palmer Thompson, Hirsch studied the making of the working class in Newark, New Jersey between 1820 and 1860. She found that Newark and its industry grew very rapidly in this period—in large part at the expense of artisans in eight different crafts. In this transformation most master craftsmen became employers while most journeymen and apprentices were reduced to common factory hands whose frustration manifested itself in the rise of labor unions. Skilled hands diminished as a percentage of the labor force, suffered a loss in status, and also a loss of artisan consciousness or solidarity. By 1860 capital requirements were simply too great to allow artisans to play a significant role in Newark industry. In short, something jarring, disruptive, and painful had befallen those who had relied on hand technology for their livelihood.

The quiet and subtle implication in all of this is that wherever the modern factory system reared its head, artisans suffered. There is no serious effort to indicate that Newark may represent one of the more extreme cases. But, how representative is Newark? Would the story differ in another cultural milieu? What, for example, would the story look like in Lancaster, Pennsylvania? To study the question of persistence in Lancaster and make a comparison with Newark it seemed
necessary to define a term or two, construct a time series to reveal trends in the number of craftsmen working in Lancaster, and finally try to explain any differences between the two experiences.

In this consideration an artisan, craftsmen, or one employing hand technology is an individual relying primarily on a knowledge of technique, skilled hands, simple hand tools, a degree of creativity, and human strength to produce products generally lacking machine uniformity. Hand technology ignores heroic machinery, steam power, mass production, and other trappings of the modern factory system. This is not to suggest that all artisans functioned without machinery as potter's wheels and printing presses were understood to be part of their traditional milieu.

Twenty-two craft occupations were examined to provide a broad picture of hand technology in Lancaster (Hirsch studied eight.) An effort was made to determine the number in each occupation for 1819 (clearly pre-industrial), 1850 (early industrial), and 1880 (mature industrial.) Numbers could be gleaned from the U.S. Population Manuscript Census, the U.S. Manufactures Manuscript Census, Lancaster County Tax Assessment Lists, City Directories, and a special compilation of craftsmen in the files of the Lancaster County Historical Society. This last source, unfortunately, covered only six occupations. For the year 1819 the most reliable broad enumeration is provided by tax assessment lists. Admittedly, this guarantees some undercounting as some journeymen would be missed. For 1850 and 1880 a choice had to be made between the population census (with its guaranteed undercount) and the manufactures census (with its even greater potential for fiction.) The population census data were selected. Thus it is assumed that the data for 1819, 1850, and 1880 are the best available and represent, in each case, undercounting. (Evidence of persistence is not intended to demonstrate that absolutely nothing changed in the business practices or work techniques of these artisans. For example, a decline in custom work is assumed.)

Though admittedly this table lends itself to more than one interpretation, the following observations are advanced for consideration. (1) In the transition from a pre-industrial to an early industrial economy, and also from the early to the mature industrial economy there was considerable growth in the number of artisans working in Lancaster. (2) The increase in artisans in absolute terms is at least as important or meaningful as change measured in relative terms. Put another way, it is at least as important to know that the number of artisans increased from 631 in 1819 to 929 in 1850 as it is to know that their rate of growth was
Table 1:
Artisans—City of Lancaster, Pennsylvania

<table>
<thead>
<tr>
<th></th>
<th>1819</th>
<th>1850</th>
<th>1880</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blacksmiths</td>
<td>53</td>
<td>79</td>
<td>136</td>
</tr>
<tr>
<td>Bookbinders</td>
<td>5</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Cabinetmakers</td>
<td>27</td>
<td>56</td>
<td>55</td>
</tr>
<tr>
<td>Carpenters &amp; Joiners</td>
<td>90</td>
<td>199</td>
<td>287</td>
</tr>
<tr>
<td>Chairmakers</td>
<td>7</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>Coachmakers</td>
<td>32</td>
<td>34</td>
<td>154</td>
</tr>
<tr>
<td>Coopers</td>
<td>22</td>
<td>17</td>
<td>21</td>
</tr>
<tr>
<td>Coppersmiths</td>
<td>13</td>
<td>25</td>
<td>8</td>
</tr>
<tr>
<td>Gunsmiths</td>
<td>19</td>
<td>32</td>
<td>14</td>
</tr>
<tr>
<td>Hatters</td>
<td>34</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Piano &amp; Organmakers</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Potters</td>
<td>8</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Printers</td>
<td>15</td>
<td>45</td>
<td>129</td>
</tr>
<tr>
<td>Saddlers</td>
<td>48</td>
<td>30</td>
<td>38</td>
</tr>
<tr>
<td>Shoemakers</td>
<td>121</td>
<td>193</td>
<td>151</td>
</tr>
<tr>
<td>Silver &amp; Gold Work</td>
<td>7</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Tailors</td>
<td>63</td>
<td>93</td>
<td>63</td>
</tr>
<tr>
<td>Tanners &amp; Curriers</td>
<td>28</td>
<td>19</td>
<td>71</td>
</tr>
<tr>
<td>Tinsmiths</td>
<td>17</td>
<td>29</td>
<td>59</td>
</tr>
<tr>
<td>Turners</td>
<td>11</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Watch &amp; Clockmakers</td>
<td>7</td>
<td>14</td>
<td>47</td>
</tr>
<tr>
<td>Wheelwrights</td>
<td>3</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>631</td>
<td>929</td>
<td>1,297</td>
</tr>
<tr>
<td></td>
<td>+298</td>
<td>+368</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(+47.2%)</td>
<td>(+39.6%)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Many of the 154 coachmakers and 47 watchmakers listed in the 1880 count—and perhaps some others—are most accurately described as quasi-artisans. That is, they are highly skilled individuals employing traditional craft know-how in a factory setting. They have an employer who pays wages and provides tools, and yet they still identify decidedly with earlier craft traditions. Given the high degree of skill and knowledge they bring to the workplace, it seems unreasonable to call them factory hands. The quasi-artisan, according to Anthony F. C. Wallace, represents an oft-overlooked but important transitional stage in the evolution of production methods. They are included in the enumeration because they represent the perpetuation of artisanal qualities and characteristics.

less than the rate of growth for the general population. This methodological issue is crucial for in both Lancaster and Newark the artisan community exhibited healthy numerical growth throughout the periods studied. This is strange behavior for hand crafters that are supposed to be disappearing. It is tempting to observe that "reports of the death of the artisan are greatly exaggerated." In one sense the problem of the "disappearing artisan" is analogous to the glass that is both half empty and half full. Both statements are correct and potentially useful. Why, then, have historians been willing to see only the half that is empty? (3) Where there are twenty-two different crafts mentioned, there are
Hand Technology

Twenty-two different stories to be told. The most significant would treat those occupations that either expanded or contracted sharply during the years in question.

Expanding Craft Occupations

Carpenters flourished in 19th century Lancaster and displayed their now famous resiliency to technological obsolescence. The existence of several small firms manufacturing sashes and doors\(^5\) constituted a modest threat that clearly reduced some of the demand for traditional carpentry work, but abundant opportunity remained—particularly in the residential building booms of the 1850s and 1870s.\(^6\) Commercial, industrial, and institutional construction provided yet additional opportunity. The threat to the well-being of the carpenters resided not in the industrial revolution (that generated so much building), but in the endless peaks and valleys of the volatile construction industry.

Blacksmiths also proved to be quite resilient. This is particularly interesting in light of the strength of local secondary metals industries—especially machine shops and tool makers.\(^7\) The persistence of smiths indicates that they did not have to compete directly with local machinists and edge tool makers. Smiths made a variety of hinges, latches, and locks, and thrived on an endless stream of repair work such as putting new faces on edge tools or forge welding or riveting broken metal tools or household objects. Industrialization made horsehoes available in any hardware store, but that did not eliminate the healthy trade in shoeing.\(^8\)

Printers, whether specializing in “book and job” or putting out a daily or weekly newspaper, generally benefited from the onslaught of modernity. On the supply side of the equation improved paper making and the introduction and refinement of the double cylinder rotary press reduced costs and contributed to the rise of the famed penny press. On the demand side there was an expanding population, gains in literacy, and the growing needs of businessmen and industrialists to advertise. Competition in the newspaper business was intense as German language newspapers were published throughout the 19th century as well as at least two papers in English—to represent competing political viewpoints. Printers often found it necessary to supplement their incomes through such activities as book binding and the sale of paper.\(^9\)

From the vantage point of the artisan technological advances in printing opened the door to the use of some child labor—perhaps thinly disguised as “apprentices”—and yet opportunities for skilled hands continued to
Tinsmiths constitute yet another group of artisans apparently unscathed by the 19th century factory system. “Tinsmith” was often too narrow a title for someone who was likely to work with copper and sheet iron as well, and yet a surprising number did assume a specific label. The explanation for the tinsmith’s well-being is rather straightforward: he produced a wide variety of attractive and inexpensive household items such as coffee pots, funnels, and lanterns for a growing population with more and more discretionary income. It is also clear that some tinsmiths applied their talent to less artistic endeavors such as down spouts and tin roofs though it is less clear what percentage of the market they captured.

The preceding paragraphs serve as important reminders that carpenters, blacksmiths, printers, and tinsmiths are excellent examples of those who engaged in handcrafting in a maturing industrial economy. The same could be said for bookbinders, coachmakers, curriers, tanners, watchmakers, and wheelwrights. At the same time, it is clear that some crafts faced contraction. Cabinetmakers were hurt, in part, by the introduction of factory-made furniture, but also by a major shift in consumer taste: the demand for tall clocks plummeted sharply in the 19th century. Both shoemakers and tailors lost ground to the industrial sewing machine while Lancaster gunsmiths and hatters became less numerous—the production of guns and hats being concentrated elsewhere. Coppersmiths and turners also became less numerous. Nevertheless, the aggregate figures for all twenty-two artisan categories show healthy advances between 1819 and 1850, and between 1850 and 1880 suggesting that hand technology not only coexisted with Lancaster’s factory system but during the period in question expanded with it. The assumption that one mode of production must contract if another expands need only be true if one assumes the economic pie to be constant. If, in contrast, the economic pie is growing, there is nothing conceptually awkward about conceiving of two modes of production expanding simultaneously—at least for several decades, which was the case in Lancaster.

Accepting Hirsch’s analysis that the coming of the factory system decimated artisan ranks in Newark and analysis in this paper regarding the persistence of hand technology in Lancaster, how can the difference be explained? Some promising possibilities reside in an examination of cultural factors influencing persistence.
Tradition. To begin, hand crafting was a far more important tradition in Lancaster than it was in Newark. Although Newark is considerably older (founded in 1666 vs. 1730 for Lancaster), and although Newark had a variety of hand crafters from the beginning as most any community did, artisan activity appears to have been something other than a dominant influence in the community. Newarkers in the 17th and 18th centuries focused their attention elsewhere. For example, there were opportunities provided by the existence of a port—importing, exporting, whaling, ferrying, etc. The town was well known for the orchards that were maintained and the vast quantities of cider produced. Nearby quarries made it possible to export stone. Timber production was important in the early history as was farming—some of the latter taking place within town limits as lots were unusually large for an urban setting. Newark was also a market center for the surrounding hinterland. These are the activities that dominated the life of colonial Newark. Shoemaking was not important until the end of the 18th century, there was no Newark newspaper until 1791, and carriage building did not appear until the 19th century.

Lancaster, by the way of contrast, was a community in which craft activity overshadowed other activity in the 18th century. Over thirty years ago Carl Bridenbaugh in a slender volume *The Colonial Craftsman* devoted six pages to the artisans of Lancaster—including the compliment “residents of Lancaster and its environs . . . evolved from imported articles two pieces of intricate craftsmanship representing not a recession from Old World standards of quality and beauty, but a marked improvement upon them in all respects.” (He was referring to the Pennsylvania Rifle and the Conestoga wagon.) A decade ago James Lemon writing in *The Best Poor Man’s Country* noted the importance of hand crafts in 18th century Lancaster, with particular notice being given to gunsmiths, saddlers, and weavers. It is noteworthy that entire books have been devoted to the riflemakers, silversmiths, and clockmakers of Lancaster. Two Winterthur theses of recent vintage draw additional attention to the town’s 18th century craftsmen: John Snyder chronicled the emergence of a regional style of cabinetmaking or Lancaster Chippendale while Doris Fanelli studied carpenters, joiners, turners, and cabinetmakers. Two years ago Jerome Wood’s book on the 18th century town entitled *Conestoga Crossroads* devoted an entire chapter to handcrafts. James A. Mulholland’s recent *History of
Metals in Colonial America cites the wheelwrights and gunsmiths of Lancaster.

To make the same point statistically, on the eve of the American Revolution sixty-six percent of Lancaster taxables were identified as artisans.\textsuperscript{20} Available evidence also reveals a high degree of specialization among Lancaster artisans with 104 different occupations listed in 1800 versus 72 for Reading and 69 for York—neighboring cities.\textsuperscript{21} Gunmaker and inventor William Henry became famous as did portrait painter Jacob Eicholtz. Several others such as pewterer Johann Heyne, clockmakers John Eberman, Jr. and John Hoff, silversmith Peter Getz, and organ builder David Tanneberger are certainly noteworthy. Several of the local artisans produced for a wider market. What really matters in this instance, however, is that a deeply rooted and recognized craft tradition had been established by the time of the French and Indian War. In brief, Lancaster produced more than its share of rifles, silver, pewter, highboys, tall clocks, wagons, and copper products in the 18th century, and this tradition was not readily abandoned. It has been said that Lancastrians came to see themselves as a community of artisans and took pride in the designation.

Ethnic Tradition. As a footnote to the influence of tradition on persistence it should be noted that Lancaster's 18th century craft tradition was also an ethnic craft tradition. Dramatic evidence of this can be seen in Doris Fanelli's study of 134 woodworkers who spent anywhere from 1 to 37 years working in the town between 1750 and 1800. Fanelli determined that 85 percent of these artisans were Germans.\textsuperscript{22} Most of Lancaster's Germans came from Baden, Hesse-Darmstadt, Bavaria, and Wurtenberg—or southern and western Germany.\textsuperscript{23} To no one's surprise they celebrated their ethnicity through the establishment of German language churches, singing societies, and German language newspapers such as the Lancaster Zeitung or Lancaster Volksfreund.\textsuperscript{24} Germanic flourishes became a common part of local hand crafting. For example, a regional style of cabinetmaking known as Lancaster Chippendale was most commonly characterized as "Philadelphia style with Germanic variations."\textsuperscript{25} Thus, Lancaster's 18th century craft tradition was reinforced by a common ethnic bond. This Germanic influence spilled over into the 19th century. For example, in 1850 although only 23.7 percent of the town's artisans were foreign born, 78.4 percent of the foreign born were German.\textsuperscript{26}

The Pace of Urban-Industrial Change. While the winds of modern industrialization and urban growth blew across both Lancaster and Newark in the 19th century, the gusts in north Jersey were far stronger
than the gusts in south-central Pennsylvania. Put another way, urban industrial growth came to Newark with a vengeance while, in contrast, it proceeded at a less staggering pace in the Red Rose City. All of this is readily supportable with data on the introduction of steam power, value added in manufacturing, etc., but what is even more dramatic here is the relative pace of urban growth. In 1820 the two cities were the same size (Lancaster, 6,633; Newark 6,507.) Over the next thirty years Lancaster fell a bit short of doubling in size (12,369 in 1850) while Newark in a quantum leap forward became six times larger (38,894 in 1850). Between 1850 and 1880 Lancaster doubled in size (25,769 in 1880) while Newark became 3½ times larger (136,508 in 1880). Over the entire sixty year period in question Lancaster grew by a factor of 4 (3.89) and Newark by a factor of 21 (20.98.)

The significance of this for craft persistence is, in part, that artisans in Lancaster had more time—and therefore more opportunity—to react to new competitive forces and give serious thought and effort to enhancing their own efficiency and competitiveness.\footnote{Local Conservatism. The less frantic pace of urban-industrial expansion in Lancaster and the tenacity of hand crafting are characteristic of a deeply ingrained local conservatism.\footnote{The business and community leaders who were responsible for bringing factories to 19th century Lancaster did so with caution. For example, when a cadre of merchants considered the introduction of steam-powered cotton mills in the mid 1840s (characteristically a bit late), they engaged the services of a consulting engineer, toured several New England towns to gain first hand knowledge of cotton mill operations, and then proceeded to build mills considerably smaller than the consulting engineer Charles Til-linghast James was accustomed to building.\footnote{Repeatedly in Lancaster’s industrial endeavors caution remained the byword. “Has the idea already been tried somewhere else?” “Does it work?” “Is there a danger of overbuilding?” “Is there really anything to be gained from growth for growth’s sake?” This conservative outlook is also apparent to Dun and Bradstreet credit reports in which Lancaster firms were often judged to be worthy of considerably more credit than they sought.\footnote{In many instances, however, they simply chose not to expand. The authors of Gritty Cities got it right when they noted that Lancaster “has the air of having grown up reluctantly and accepted industry with some measure of skepticism.”\footnote{With a few notable exceptions, they are correct. In such a cultural setting hand crafting had more than a decent chance to coexist. This same caution and conservatism helps to explain the ongoing}}}}
local patronage of hand-made products. To claim that many Lancastrians had a reverence for "the old ways" and more traditional technology would be to engage in overstatement. (Though it might accurately describe the attitudes of their Amish and Mennonite neighbors in the surrounding countryside.) Reverence is too strong a concept here. The whole thing is really quite a bit simpler. Lancastrians knew what they were used to, they knew what they liked, they knew what worked, and they generally preferred to stick with the familiar. Consider, for example, the case of the Lancaster clockmakers. These craftsmen successfully built tall clocks from the middle of the 18th century through the third quarter of the 19th; however, they never made the transition to the production of mantel clocks when mantel clocks became all the rage across America. Why not? It is entirely possible that Lancaster's clockmakers (who were actually responsible for the elaborate and sophisticated time-keeping mechanisms) and local cabinetmakers (who built the block cases as high-styled and expensive furniture) both found the prospect of building far smaller mantel clocks less challenging and less interesting—even less profitable. At the same time, the ability to make the transition assumes a certain strength in local demand, which surely includes local taste, and this is a precarious assumption at best. Put another way, conservative Lancastrians did not readily change their buying habits. There is no reason to believe that a comparable aura of conservatism shrouded Newark.

Here, then, are the major cultural factors that contributed to the persistence of hand technology in Lancaster: (1) a deeply ingrained and highly specialized 18th century craft tradition, (2) an established craft tradition that was also an ethnic craft tradition, (3) a rate of urban industrial growth that did not overwhelm the artisan community, and (4) a profoundly conservative outlook that served as a brake on change in general. In each instance what was true for Lancaster was not true for Newark.

Are there yet other cultural differences that might be cited? There are, but they are advanced only tentatively. (1) Assuming for a moment that wealth is a cultural rather than an economic factor, it is entirely possible that 19th century Lancaster was a wealthier community and thus better able to patronize artisans than 19th century Newark. Available data make it possible to argue the point either way; nevertheless, Lancaster probably enjoyed a broad-based affluence unmatched in Newark. (2) As a community in the immediate orbit of New York City (only 8 miles to the west), Newark had only limited control over its 19th century destiny as New York City forged ahead. Lancaster, in contrast, though something of a satellite of Philadelphia, was situated 60 miles
west of Philadelphia and thus had greater independence. (3) Newark is a port and Lancaster is not, and perhaps more should be made of this. Conceivably, artisans in a port town were a bit more vulnerable to the competition offered by imported goods. (4) Finally, it has been said that well-to-do people living in the hinterland—and not trusting what passed for a local "banking system"—often felt safer maintaining their wealth in their homes, furniture, and silver. Recognizing that Lancaster banking was not comparable to New York banking identifies one more reason Lancastrians patronized local artisans to the extent they did.

In conclusion, it has been easy to grow comfortable with the idea that whenever and wherever the modern factory system reared its head artisans and hand technology were rather hastily and decisively driven into oblivion. This argument tends to obscure a healthy and extended period of coexistence on the part of the artisan and the modern factory, and also the extent to which the artisan community often expanded in the face of the industrial challenge. Lancaster is an excellent example of this coexistence and expansion. The cultural milieu of the Red Rose City was highly conductive to the persistence of hand technology. Given the endless variations in cultural settings, there is no reason to suppose that all the world is Newark!

This research was first presented as a paper before the Society for the History of Technology in Philadelphia on October 29, 1982. I am indebted to Professor Anthony F. C. Wallace who served as commentator and made several helpful suggestions.

NOTES

1. Norman Ware, The Industrial Worker, 1840–1860 (Boston, 1924.)
4. See Hirsch p. 25. In Newark the number of artisans grew from 8,017 in 1826 to 71,941 in 1860.
5. U.S., Bureau of the Census, Seventh through Tenth Census, 1850–1880, Manufactures, manuscript.
6. Accounts of these building booms, including applications for building permits and advertisements for individual properties, can be found in Lancaster newspapers of the period.
7. U.S., Census, Manufactures, manuscript.
8. Beyond the manufactures census, two relatively recent works shed additional light on blacksmithing in the Lancaster area: Carroll Hopf and John Tyler, The Blacksmiths (Harrisburg: PH&MC, 1972) and Jeanette Lasansky, To Draw, Upset, and Weld (Lewisburg, 1980.) An excellent broader view of the world of the blacksmith can be found in James A. Mulholland's A History of Metals in Colonial America (Birmingham, Alabama, 1981.)

10. See U.S., Census, Manufactures, manuscript.

11. A discussion of the world of the 19th century tinsmith can be found in Jeanette Lasansky, *To Cut, Piece, and Solder* (Lewisburg, 1982.) See also, A. Mulholland, *History of Metals*.


16. The most useful of these for this particular study is by Stacey B. C. Wood and Stephen E. Kramer, *Clockmakers of Lancaster County and Their Clocks, 1750-1850*. Vivian Gerstall, *The Silversmiths of Lancaster* (Lancaster, 1972) is primarily a descriptive work. Samuel E. Dyke has written extensively on guns and gunmakers of Lancaster.

17. For a summary of this research see John Snyder, “Carved Chippendale Case Furniture from Lancaster, Pennsylvania,” *Antiques*, May, 1975.


20. See *Tax Assessment Records*, Lancaster County Historical Society.


22. Fanelli.

23. This information was gathered by the author from the U.S., Bureau of the Census, *Population*, manuscript.

24. The *Lancaster Zeitung*, first printed in 1752, was the town's first newspaper.

25. For a detailed discussion or illustrations of this style see the previously cited works of John Snyder, Doris Fanelli, or Stacey Wood.


29. For a discussion of Lancaster’s conservatism see Winpenny, *Industrial Progress*.


31. These invaluable credit reports can be found in the Eleutherian Mills Historical Library, Greenville, Delaware.


33. See Wood and Kramer, *Clockmakers of Lancaster*. 