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The Industrious Revolution in America

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*The Industrious Revolution* is an economic history landmark, restructuring the pre-Industrial Revolution landscape in terms at once both vivid and prosaic. Identifying the household as a primary economic unit, Jan de Vries argues that the “long eighteenth century” running from 1650 to 1850 marked a fundamental change in the terms of interaction between nuclear families and the market economy in Western Europe. The essence of the change was “a simultaneous rise in the percentage of household production sold to others and a rise in the percentage of household consumption purchased from others” (p. 71). “Simultaneous” in this usage should be understood in the economist’s sense that these phenomena were “jointly determined” as a goal-oriented behavioral pattern, not that all of the component changes occurred at a single historical instant. Consumer desires were triggered by new goods from abroad (such as tea, coffee, sugar and tobacco), and subsequently extended to such items as clothing and household furnishings valued for their style, workmanship and appearance (pp. 133-154). Households attracted by these consumption goods became more specialized in marketable products, devoted more hours to household manufacturing (sometimes called “proto-industry”), and increased time spent working for others in the labor market (pp. 92-113). De Vries’s essential historical point is that this behavioral transformation predated the technological breakthroughs of the Industrial Revolution, setting the stage for (though not “explaining”) that great supply-side event (pp. 110-113, 180).
The purpose of this essay is to consider what adaptations and amendments may be required in order to apply this analysis to the economic development of the United States. That North America is intended to be part of the *Industrious Revolution* sphere is evident from many examples provided in the book. De Vries writes: “From an early date colonists in British North America came to view their land-abundant environment not as a platform for self-sufficiency but as a resource with which to participate – through a flood of marketed tobacco, rice, indigo, wheat, fish, timber and tar – in the Atlantic economy’s consumer offerings” (p. 96). The author goes on to cite Gloria Main’s explanation for “the emergence of rural industrial activity where one would least expect it,” (land-abundant New England in the first half of the eighteenth century) as “a colonial adaptation to an expanding mercantile economy, a gendered variant of the intensification of labor” (p. 98). These colonial snapshots, and many others, fit the Vriesian template well. But at least three widely noted features of North American economic history may call for interpretive adjustments:

1. High Mobility. For many settlers, the very act of migrating to a new continent embodied an aspiration towards upward social and economic mobility, and thus could be taken as an additional indicator of Vriesian industriousness. Upon arrival, the land-abundant setting gave rise to continuing new opportunities for advancement via migration, and high geographic mobility thus became an enduring feature of American economic life. Mobility or potential mobility was clearly consequential for family life. Gloria Main writes: “…young people in New England had a choice that their counterparts in old England did not: They could move far away from home, work hard, and build a farm, or they could stay, seize the new opportunities afforded by expanding
markets, and, by controlling costs through sexual restraint, still hope to enjoy the high,
and interesting, standard of living enjoyed by their elders.”\textsuperscript{1}

2. Opportunities for Farm Ownership. Land abundance, high mobility, and active
markets in real estate generated greater opportunities for farm ownership in North
America than in most of Europe. For this reason, the same energies for household
advancement tracked by de Vries were often channeled in the New World towards
attaining or maintaining ownership status. Such aspirations were not (or at least not
intended to be) inconsistent with high levels of material consumption, but they gave rise
to norms and behavioral patterns that deserve special attention. As Thorstein Veblen
wrote in 1923: “Habitually and with singular uniformity, the American farmers have
aimed to acquire real estate at the same time that they have worked at their trade as
husbandmen…They have been cultivators of the main chance as well as the fertile soil.”\textsuperscript{2}

3. Slavery. Although slavery had been in decline in Western Europe for centuries,
replaced by nationalist ideologies boasting that the air of the country was “too pure to be
breathed by slaves,” the institution was revived and became entrenched in the Americas.
How did slavery affect the behavior of industrious households? Prior to the American
Revolution, as Jack P. Greene has emphasized, slavery was an integral and accepted part
of British American culture, and the southern colonies were in the mainstream in this
respect, epitomizing the vision of America as a place where “free people could pursue
their own individual happiness in safety and with a fair prospect of success.”\textsuperscript{3} After the

\textsuperscript{1} “Rocking the Cradle: Downsizing the New England Family,” \textit{Journal of Interdisciplinary History} 37
(Summer, 2006): p. 58.
\textsuperscript{2} \textit{Absentee Ownership and Business Enterprise in Recent Times} (New York: B.W. Huebsch, 1923): p. 135.
\textsuperscript{3} \textit{Pursuits of Happiness: The Social Development of Early Modern British Colonies and the Formation of
Revolution, however, slavery became confined to the southern half of the United States, with profound effects on patterns of settlement, markets, consumption and labor.

The list of distinctive American features could easily be extended. But as these three are already not entirely independent of each other, it seems wiser to keep the number of “basic” items to a minimum, and turn instead to a de Vries-like schematic narrative intended to show how the American case differed, and with what consequences for economic history. Taken together, it will be argued, mobility, farm ownership and slavery altered the timing and shaped the geographic spread of the Industrious Revolution in America. The larger objective, it should be stressed, is neither to refute de Vries nor to promulgate yet another variation on the familiar theme of American exceptionalism. Rather, the purpose is appreciative, to show the rich character of the de Vries framework when adapted to the history of the United States, a prime example of intensified work effort and rising market orientation as wellsprings of economic growth.

The Rise of Atlantic Trade

The British settlers who came voluntarily to North America certainly intended to maintain or achieve a European standard of living, if not better. But this proved difficult in the early years, as frontier conditions and the absence of markets drove many farm households into extreme self-sufficiency. By the eighteenth century, however, improvements in material conditions plus declines in transportation and distribution costs generated a vast expansion of trans-Atlantic trade. Although colonial imports included some producer goods, such as wrought iron and nails, the great bulk of shipments were consumer goods, including salt, sugar, tea, rum, glassware, fustians, linen, silk, stockings, and cotton cloths. Thus, the rise of imports may be taken as an indicator of the
expanding consumer economy of colonial North America, the most rapidly growing market for British goods prior to the American Revolution.⁴

Figure 1 displays the rise of imports to the mainland colonies, divided into two regional groups according to their later decision as states on the slavery question. It is evident that import consumption grew throughout the colonies. In Vriesian fashion, this expansion was associated with innovation and growth in retail trade, adapted to the American setting. No formal system of market-towns developed, but merchants who handled cash crops began to hold and sell “stores” of consumer goods, a usage unfamiliar to the British, and bringing into being “a new person, the shopkeeper.” David Jaffee writes that beginning in the 1740s, “…newspaper advertisements, business documents, probate records, and other sources all indicate that an increasing volume of textiles, ceramics, glassware, and utensils was available to people at all social levels.” By the 1770s, the ratio of population to retail establishments in Massachusetts was comparable to that in England. Timothy Breen argues that the passion for “Baubles of Britain” served as a vehicle for standardization of taste across the colonies, contributing to the cultural cohesion that made the American Revolution possible.⁵

Whether the typical colonial household actually worked more total hours in response to these new incentives may be questionable, since (as Main writes) “work was

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what most people did most of the time” from the beginning. But the desire for consumer goods may have induced them to “work smarter” in the mid-eighteenth century, by orienting farm production towards markets, and by expanding indoor tasks to generate cash income. Winifred Rothenberg shows that after 1750, Massachusetts farmers intensified their efforts to produce goods for sale, keeping account books whose valuations reflected prices in accessible markets. Wives and daughters also contributed to household income, by making cheese and butter, by selling eggs and garden crops, or by spinning, knitting and sewing. The rise of consumption standards was often complementary to cottage industry. For example, the expansion of homes to include a second story was both a form of consumption and a means of increasing production, providing space for regular use of a spinning wheel.6

The demand for consumer goods was on the rise throughout the mainland, but Figure 1 also points to an emerging contrast between the northern and southern colonies. For the first half of the century, imports into the two regions were roughly equal. But after 1750, the North moved decisively ahead by this measure, importing 25 percent more than the South on average during these years. This difference is at first surprising, because exports to Britain from the southern colonies were far higher throughout the period. The contradiction is only apparent, however. Northerners were able to import more than they exported, because of the greater role of “invisibles” in their economy (noncommodity services such as shipping and finance), and because of intra-imperial

trade with the southern colonies and particularly with the West Indies. The volume of coastal commerce was nearly equal to overseas trade by the 1770s.

Behind these regional differences in structure lay deeper differences in economic geography and economic demography, ultimately traceable to slavery. The proximate cause of the import gap was the more rapid growth of the free population in the North. As early as 1760, Benjamin Franklin described the emerging pattern: “The trade to our Northern colonies, is not only greater, but is yearly increasing with the number of people: and even in a greater proportion, as the people increase in wealth and the ability of spending as well as in numbers.” In contrast, as observed by Rev. Jared Eliot of Connecticut in 1759: “Slaves spend but little…there will not be a proportionable demand for English goods…People of a free condition live at an higher rate, spend more, and consequently the demand for goods will be larger.”

Economists may object to the Franklin-Eliot diagnosis, on the grounds that the total value of spending must equal the total value of product, whether that product is produced by free or slave labor – a version of Say’s Law applied to a regional economy. This is where the Vriesian dynamic helps to clarify the issue. Demand patterns in the southern colonies differed from those in the northern colonies, not because slave labor failed to generate purchasing power, but because the slave-based economy altered the relationship between the producing unit and the suppliers of credit and consumer goods, between town and country. Breen notes the “strikingly different” networks of exchange in the Chesapeake compared to New England and the middle colonies. Initially, elite planters consigned their tobacco crops to merchants in London, who provided a variety of

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business services as well as supplies of English goods. In the eighteenth century, Scottish merchants offered a market for tobacco, as well as generous credit terms and a variety of imported goods, at chains of stores stretching far into the navigable waterways of the Chesapeake area. This innovative method of bringing the goods virtually to the farm itself extended the consumer revolution well down the social scale. But crop finance and consumer supplies remained integrated in the southern colonies, in contrast to the North, where retailing became an independent, highly entrepreneurial pursuit.9

In their study of wheat-growing areas in backcountry Virginia, Warren Hofstra and Robert Mitchell found that the effects of free farming versus slavery on town-country interaction could be observed even within a single county. The key role for an emerging center like Winchester was not mainly to market wheat and flour but to serve as a hub for import distribution to a rural clientele. As Winchester expanded, its merchant community became actively involved in local land speculation and promotion, and in political agitation for internal improvements. The town was also a way station and staging point for waves of migrants, and all of these functions attracted a cluster of artisans performing diverse functions for both rural and urban customers. In contrast, the plantation sections of the county traded at long distances and had little contact with Winchester.10

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The Market Revolution: One or Many?

If market and consumer values were so pervasive so early in colonial history, why is it that American historians continue to chronicle moments of “transition to capitalism” or “market revolution” for American farming households? One possible explanation is that these historians are themselves critical of market and consumer values, and so approach their research predisposed to identify societies in which community and family values were paramount. Jan de Vries seems inclined to this interpretation: “This is an illusion – the Jeffersonian myth – to which American historians even now remain astonishingly loyal, supposing, as many of them still do, that colonial Americans condemned the modern commercial mentality and that a ‘market revolution,’ like the serpent in the garden, expelled Americans from their paradise only in the Jacksonian era, circa 1830.”11 The fact that numerous alternative transition dates have been advocated may be taken as support for the view that an ideological impulse has been at work.

But historians draw upon the contemporary record of social and political commentary, and however much their readings may be shaped by their own values, they are usually not making it up out of whole cloth. It may be rewarding, therefore, to dig somewhat deeper and ask why American farmers and their advocates have found such recurring resonance with the theme of conflict between family values and the market.

One reason is that the transition from production for on-farm consumption to production for the market was not a one-time, either-or event, but a long-term trend that stretched across centuries. Figure 2 displays Thomas Weiss’s estimates of gross agricultural output per worker for the nineteenth century, distinguishing between a “broad” output measure that includes home manufactures and improvements and a

11 Industrious Revolution, p. 95.
“narrow” alternative that counts only the market value of farm products. In 1800, the gap between the two was 17.5%, and by 1900 it had virtually disappeared. In reality, this gap substantially understates the trend towards commercialization across the century, because it does not include the crops and livestock products that were not sold but consumed on the farm. James Lemon found that late eighteenth-century “middling” farmers in southeastern Pennsylvania sold between one-third and one-half of total farm production.\textsuperscript{12} By 1900, production for on-farm consumption was minor in most parts of the country, but southerners were still in transition from “living at home” to “living out of bags” (or “living out of the smokehouse and henhouse”) in the 1950s.\textsuperscript{13} Commercialization thus stretched across the better part of three centuries.

Why was the diffusion of commercial agriculture so protracted? One important reason is that the extension of markets was uneven across time and space. Although southerners were growing export staples virtually from the beginning, in the northeast the sale of food crops began on farms that were close to towns. With urban growth came roads into the interior, fostering the two-way commerce at the heart of the de Vries narrative. David Hancock writes that the elaboration of a distributional infrastructure in the eighteenth century is “one of the great, as yet largely untold stories about the economic development of British America and later the United States.”\textsuperscript{14} But eighteenth-century roads were notoriously slow and costly. Even after the burst of road-building during the early decades of nationhood, freight rates did not really fall substantially until

\textsuperscript{12} The Best Poor Man’s Country: A Geographical Study of Early Southeastern Pennsylvania (Baltimore: Johns Hopkins University Press, 1972), pp. 27, 180-183.
the water-based Transportation Revolution of 1815-1840, centered around the steamboat and construction of canals. The opening of the Erie Canal in 1825 sparked a dramatic change in household resource allocation along its route, as farms moved into cash crops to exchange for manufactured goods, largely abandoning homespun production. True enough, these farmers may well have harbored commercial motivations all along, specifically in their decision to migrate to the anticipated canal zone. But their capacity to carry out these plans waited on the canal itself, and for many other areas the transition came decades later. Thus Richard Bushman argues that “the market can be envisioned as a rising tide that gradually inundated more and more regions, not as a switch turned on at some moment for the entire continent.”

But even when markets were available, many farmers were reluctant to rely on the market for the basic necessities of the household: food, clothing and shelter. One way to interpret these choices is as behavior towards risk, by no means synonymous with distaste for modern consumer goods. Most American farmers were owners, and maintaining farm ownership was high and perhaps their highest priority. To rely on uncertain crop yields and fluctuating commodity prices for consumption items that the farmer was bound to provide whatever the outcome, might amount to “betting the farm” imprudently. The risk was particularly acute at a time when credit markets were poorly developed, and (then as now) the likelihood of qualifying for a loan was inversely related to the desperation of the need for one. Although one could interpret such behavior as an irrational concern for ownership status, a more plausible reading in the American context is that farm

ownership was seen as central to a lifetime accumulation strategy, not as a preference for status over consumption standards.\footnote{Richard Bushman, “Family Security in the Transition from Farm to City, 1750-1850,” \textit{Journal of Family History} 6 (Fall 1981).}

Thus American farmers wrestled with the market-nonmarket decision at the margin, and in a literate society, they often put their doubts into print. As late as the 1850s, a New England farmer wrote: “As a general rule, however, it is better that the farmer should produce what he needs for home consumption…He may obtain more money from tobacco or broom corn, than from breadstuffs, but taking all things into consideration, will he be better off?”\footnote{Quoted in Clarence Danhof, \textit{Change in Agriculture: The Northern United States, 1820-1870} Cambridge: Harvard University Press, 1969), p. 23.} The wistful and moralistic tone is what attracts social historians. Their mistake is to presume that the transition occurred at a single point in historical time. But they are not wrong to believe that choices between market and nonmarket activities encompassed elements of financial prudence, family values, intra-household bargaining, and community relationships.

In 1975, Howard Kunreuther and I proposed an analysis of crop choices by nineteenth-century southern farmers along these lines, invoking the managerial precept known as the “safety-first” principle: plant enough corn to meet the farm’s needs with a high degree of confidence, then allocate the remaining acreage to the cash crop cotton.\footnote{“Cotton, Corn and Risk in the Nineteenth Century,” \textit{Journal of Economic History} 35 (September 1975): 526-551.} In the northern states, most cash crops were also consumed on the farm, so that “production for use and production for exchange blended imperceptibly”;\footnote{Bushman, “Markets and Composite Farms,” pp. 363, 367.} farmers had the luxury of a post-harvest decision on how much of the product was a “surplus” to be exchanged for cash, supplies and consumer goods. The shift from (in de Vries’s terms)
“market contact” to “market orientation” could be incremental and gradual. In the South, however, food crops and cash crops were distinct, forcing a sharper pre-harvest decision. Corn was essential for the farm’s survival, and had to be either grown or purchased. Characterizing the decision in this way, as a choice between two alternative methods for obtaining corn, the postbellum price and yield data clearly show that relying on cotton was by far the riskier option. This was the logic of the steady flow of advice to southern farmers to “diversify their crops so as to raise their own supplies, and then raise all the cotton they can as a surplus crop.”

The southern case brings out another aspect of commercialization, which is that although the desire for consumer goods may be energizing and progressive going in, the same phenomena may be experienced as coercive and oppressive when markets sour. In the antebellum period, participation by small southern farmers in market exchange was limited, both because they were risk-averse and because the upcountry was largely isolated from transportation and retail facilities. These conditions changed rapidly after the Civil War, as railroads spread and country stores proliferated, offering fertilizer, consumer goods and credit. These new opportunities were initially welcomed by southeastern farmers, who rushed into cotton-growing in a major way. By the end of the century, however, the irreversibility of this path was often lamented, as reliance on credit and purchased goods left farmers no real alternative but to continue planting large cotton acreages, even when prices were low. Indeed, they often felt impelled by Vriesian logic to increase cotton planting when prices were low, as the only means they had for meeting their cash requirements. Thus, industrious behavior driven ex ante by a positive

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desire for increased consumption may be difficult to distinguish observationally from actions coerced *ex post* through credit markets and economic stress.

**Overlapping Phases**

In the basic de Vries scenario, the Industrious Revolution came first, followed by the Industrial Revolution. Patterns of household labor shaped by these two revolutions (multiple earners producing for the market) gave way after 1850 to the breadwinner-housemaker household, in which women’s work became largely nonmarket, and children were redirected from laboring to schooling. As the preceding sections show, households in the British North American colonies participated fully in the consumer revolution of the eighteenth century. But the process of reallocating farm production from nonmarket to market goods continued throughout the nineteenth century, roughly concurrent with the Industrial Revolution in America. Meanwhile, the transition to a more modern middle-class household lifestyle was underway throughout the same period.

Much of the apparent phase overlap in the nineteenth-century may be attributed to the geographic diversity of the country, particularly the contrast between the more mature sections in the east and the moving frontier in the west, plus the special case of delayed commercialization in the South. But both phases were clearly visible in New England, heartland of American industrialization, in the first half of the century. The Lowell-Waltham mills were technological marvels, pioneering innovators not only in textile machine processes but in organizational forms and labor systems. The early factory workforce was disproportionately composed of women and children, raising apparent levels of labor force participation in these categories. Yet in the same region at the

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same time, an even larger number of women labored as rural outworkers in their homes, making palm-leaf hats, straw bonnets, or boots and shoes. Table 1 displays Thomas Dublin’s estimates of the occupational distribution of wage-earning women in Massachusetts in 1837. Dublin reports that the majority of outworkers were unmarried daughters. Their families were by no means destitute, but hat-making households were distinctly poorer and larger than the others. Because these young women worked with materials supplied by sophisticated traders catering to distant markets, Dublin writes that “the putting-out system was just as much the product of the industrial revolution in this country as were the textile factories in Lowell or the central show shops in Lynn.”

But rising female labor participation in New England was experienced as a response to downward mobility, real or impending. Just as hat-making families were relatively poor, the young women who went to work in the mills came primarily from rural northern counties in the throes of agricultural decline and outmigration. Social historians differ on the extent to which these industrious young women worked mainly on behalf of their families, or mainly on behalf of themselves. Contemporaries often stressed the contribution of young women to paying off a family mortgage or putting a brother to school. But Dublin insists that these earnings were a path towards independence, showing for example that young women were often accumulating items to take into marriages, such as teacups, saucers, plates, platters, butterboats, muslin, calico, and chairs. It seems evident that both family interest and self-interest were in play.

25 Transforming Women’s Work, pp. 68, 73. For evidence from the twentieth century that earning money gave working children greater say in household consumption spending, see Caroline M Moehling, “‘She Has Suddenly Become Powerful’: Youth Employment and Household Decision Making in the Early Twentieth Century,” Journal of Economic History 65 (June 2005), pp. 414-438.
Contemplating such lists of consumption goods, one may certainly question the authenticity of notional decline. Antebellum New England may well provide an example of what de Vries calls a perceived “‘necessity’ to intensify work effort in the defense of a recently attained living standard” (p. 115). My point is that the situation contained elements from all three de Vries phases: intensified household work and multiple earners; expanded consumption opportunities through technological change in transportation and industry; and adaptation of production and consumption decisions to the expectation that women would ultimately settle into domestic life as non-earners. Timetables for these plans were disrupted by the opening of the midwest for commercial agriculture, in at least two ways: inflows of cheap goods undermined regional product markets, while western development attracted large numbers of young men, creating a scarcity of marriageable prospects in the east. Alex Field notes that between 1810 and 1830, New Hampshire had the country’s lowest ratio of men to women, slightly over 9 men for every 10 women.26

The cultural roots of the breadwinner-homemaker household stretch back quite far in American history. In the 1830s, Tocqueville wrote with an air of certainty:

In no country has such constant care been taken as in America to trace two clearly distinct lines of action for the two sexes and to make them keep pace one with the other, but in two pathways that are always different. American women never manage the outward concerns of the family or conduct a business or take part in political life; nor are they, on the other hand, ever compelled to perform the rough labor of the fields or to make any of those laborious efforts which demand the exertion of physical strength. No families are so poor as to form an exception to

this rule. If, on the one hand, an American woman cannot escape from the quiet circle of domestic employments, she is never forced, on the other, to go beyond it.  

Like most travelers, Tocqueville undoubtedly wrote more of what he heard than what he actually saw, and many historians have been quick to note that his account was not entirely accurate. But the very fact that Tocqueville heard such emphatic statements suggests that the concept of a distinct woman’s domestic sphere had a notional existence with some heritage as of the 1830s. Two decades earlier, New Englander Timothy Dwight recorded his astonishment at the sight of “ten women, of German extraction…arranged in front of a little building, busily employed in dressing flax,” near Hudson, New York. Dwight noted that he had seen women “in a small number of instances…raking hay immediately before a shower, when the pressing nature of the case demanded extraordinary exertions.” But even this he had not seen for thirty years. 

Whatever their factual accuracy, such observations underscore the pervasiveness of the idea that American women did not do field work, as well as the class-based character of this notion (closely tied to ethnicity) as a measure of proper behavior in modern times.

To be sure, proscription of female field work is not the same as relegating women to a “quiet circle” of domestic nonmarket employment. Lee Craig estimates that an adult woman in 1860 added as much to the value of a farm’s output as hiring a male farmhand from planting through harvest. But specific tasks were highly segregated by sex, and in

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New England this practice seems to go back to the seventeenth century. The economist may, of course, explain this entire phenomenon in terms of division of labor according to the comparative advantage of the sexes. The problem with this interpretation is that indentured servant women were frequently put to work in the fields, especially in the Chesapeake, albeit at times with some reluctance. Any such ambivalence ended with the transition to African slaves as the main labor force on southern plantations. Unconstrained deployment of female labor in field work was one of the primary economic advantages of slavery in antebellum America.

On many other fronts, the transition to the breadwinner-homemaker household was underway well ahead of the de Vries timetable, at least in certain sections of the country. Gloria Main notes, for example, a “spectacular increase” in female literacy in Massachusetts, beginning with the cohort born in 1695-1710 and continuing with the spread of public schooling in the eighteenth century. Perhaps partly as a consequence of higher female literacy, “the fertility transition in southern New England was already under full throttle in southern New England,” well before the great transportation and industrial revolutions of the nineteenth century. Perhaps most tellingly in the present context, these literate and numerate women were widely associated, in critical social commentary from Benjamin Franklin to Henry David Thoreau but quite possibly also in the dynamics of household decision-making, with the spread of consumerism in

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30 Gloria Main, “Gender, Work and Wages in Colonial New England,” *William and Mary Quarterly* 51 (January 1994), p. 54: “The use of ox teams, restricted to older men, effectively segregated family members into field and home workers.” Main also writes that tobacco was widely grown in New England, but there is no evidence that New England women hoed tobacco, as many did in Maryland (p. 55).


33 *Peoples of a Spacious Land*, p. 143.

34 “Rocking the Cradle,” pp. 35-58.
America.\textsuperscript{35} With evolving norms of production, consumption and childrearing pointing the way, the arrival of the breadwinner-homemaker household could not be far behind.

**Labor Scarcity and the American Workspace**

By all accounts, American farm families worked very hard, for as many hours as the seasons allowed. A full explanation for this behavior would undoubtedly encompass the Vriesian desire for consumer goods, but the derived demand for effort was enhanced in the American setting by the incentive effects provided by land abundance and its reciprocal, labor scarcity. Most farms were owner-occupied and contained more land than the family itself could cultivate. As Stanley Lebergott argues, the “reserve” of unimproved acreage fit well into the plans and constraints of family farming, as land-clearing provided a profitable activity for hours that would otherwise be idle between peak labor requirements in cultivation. Most family farms combined commercial crop cultivation with land-clearing operations, commonly making several moves and repeated purchases and sales in a lifetime.\textsuperscript{36} Thus high American levels of productivity and consumption were not primarily attributable to the *direct* impact of high land to labor ratios, but to the incentives for intensive use of family labor. Gregory Clark argues that work intensity was the main source of international differences in agricultural productivity prior to mechanization, with the United States at the top of the world list.\textsuperscript{37}


The centrality of incentives implies that land abundance should not be understood as a simple matter of relative factor "endowment," but as a feature of an economic structure with historical and institutional content. Access to farm ownership as a realistic objective was a function not just of the size of the continent, but of such economic variables as transportation costs, prices of farm products, and availability of credit, and such political variables as the price and quantity of federal lands, and diplomatic or military relations with American Indian tribes on the frontier. Thus the iconic land abundance of nineteenth-century America was powerfully shaped by the Revolution, the Land Ordinances of the 1780s, the Louisiana Purchase, and the progressively liberalized land policies from the 1790s onward, policies that put the federal government firmly in support of rapid western settlement by family farms.

This was the historical context within which long hours and an intense workspace carried over from farms to factories. Throughout the nineteenth century, the standard workday was longer in the United States than in Britain. In the U.S., the 12-hour day was common during the 1830s and 1840s, and in some sectors (such as steel) continued into the 1920s. The standard surveys place the average work day at 11.5 hours between 1830 and 1850, declining to 10 somewhere between 1880 and 1890. In Britain, maximum hours were set at 10 in 1847, while the standard had fallen to 9 by the 1870s, and to 8 in most industries (including steel) by the 1890s. In his classic work on U.S. and British technology, H.J. Habakkuk noted this differential in hours, but regarded it as merely

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another form of adaptation to labor-scarcity. On reflection this relationship is not obvious: Why should employees under conditions of labor scarcity be willing to work longer hours than workers under conditions of labor abundance?

One possibility is that there was a tradeoff between hours of work and work intensity, as was widely observed during contractions of the workweek in the twentieth century. To the contrary, however, historical testimony is unanimous that the workspace was more intense in the U.S. None felt this differential more keenly than immigrants from Britain, who found that the hours were longer and more regular, the workspace faster, and holidays rarer in their new homeland. Englishman William Darnley wrote to his wife in 1857: “I can assure you that I never worked so hard indeed I would not stop in this country if I thought I must work all my life…” Comparisons were similar elsewhere. Lamnot DuPont wrote in 1872: “It is well known that in Europe, they do not work much over half as hard as in this country.” This only deepens the mystery. One can understand why employers would want longer and more intense hours from their labor force, but how was it that relatively scarce American laborers were so readily induced to work both longer and harder?

A start at an answer is suggested by Darnley’s letter, which implied that he had no intention of working at such an intense pace for his entire life. From the Lowell-Waltham girls until World War I, the American industrial labor force was dominated by successive generations of first-time workers, who also had no intention of staying at their

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jobs indefinitely, but were willing to work intensely on a temporary basis as they accumulated savings in pursuit of an externally-defined goal – farm ownership, opening a business, migration, or some other form of upward social and economic mobility. No doubt settling into marriage was an integral part of these long-term plans in most cases. But work intensity on the job often arose from the disruption of traditional family relationships, combined with the prospect that genuine advancement was possible.\footnote{Paul David and William Sundstrom, “Old-Age Security Motives, Labor Markets and Family Farm Fertility in Antebellum America,” \textit{Explorations in Economic History} 25 (1988), pp. 164-197.}

Labor historians regularly describe American industrial employers as harsh and authoritarian. As severe as they no doubt were on the shop floor, employers nonetheless had to cope with extreme levels of turnover among their workers, from the earliest days of nationhood if not earlier. Mobility was associated with land abundance, but it also had legal and political foundations. The idea that labor scarcity translates automatically into high labor mobility is refuted by the obvious counter-example of African slavery. But with the abolition of slavery in the northern states, legal precepts moved towards a radical form of free-labor doctrine, in which employees were entitled to quit without notice, and even to receive compensation in quantum meruit for the work time they had already put in. According to legal historian Robert J. Steinfeld, a tipping point in this “invention of free labor” came when slave owners tried to enroll their newly freed former slaves in long-term contracts as servants. These thinly disguised subterfuges tended to discredit all forms of long-term labor contracts, from indentured servitude to apprenticeship.\footnote{The Invention of Free Labor (Chapel Hill: University of North Carolina Press, 1991), pp. 138-143.}

Significantly, what Steinfeld calls the “norm of high mobility” was established prior to the first wave of industrialization. Sharon Salinger describes a marked rise in turnover at the artisan shops of Philadelphia beginning in the 1780s, where journeymen
came and went so frequently the shops resembled “immigrant way stations.” The giant Lowell-Waltham mills were the most famous of enterprises that built an expectation of rapid turnover into their management system and even into the physical plant itself, in the form of dormitories to accommodate young, unmarried women for periods of one to three years. Job tenures may have been even shorter in mills employing the family-based Slater or Rhode Island system, for which Jonathan Prude estimates a mean turnover rate of 163 percent between 1813 and the mid-1830s. A number of firms tried to implement twelve-month contracts during the 1820s in an effort to reduce turnover, but without success; indeed, the companies often found themselves rehiring workers who had quit before the full year stipulated in their contracts. After 1830, most contracts were for shorter periods, in practice not effectively different from the enforcement provided by the two- or four-week pay period. It is worth noting that these patterns were in place prior to the surge of Irish immigration after 1845. If anything, turnover rates in the textile mills increased as the labor force became increasingly dominated by immigrants.

Whether these ambitious workers actually achieved their lifetime goals is of course another matter. Evidently the promise of betterment was sufficient to keep them moving. A generation of attempted social-mobility studies for nineteenth-century America found, as its primary conclusion, that geographic mobility was extraordinarily high, especially for the unskilled. More recent studies, using matched samples across

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45 *The Coming of Industrial Order* (Cambridge: Cambridge University Press).
census dates, find more optimistic results with respect to occupational gains, confirming the economic efficacy of migration. High geographic mobility seems to have become a true national trait. Figures assembled by Adna Weber in 1899 on the proportion of the population living in its township or county of birth showed the U.S. population to be more mobile than that of any other country. “Indeed,” he concluded, “it appears from the table that Americans are more accustomed to migrate from State to State than are Europeans from country to country.” Explicitly comparative evidence is rare, but a survey of case studies shows that persistence rates in U.S. cities were considerably lower than those in British cities. High mobility rates have been found in every type of American community, including older cities that were not growing in net population.

Perhaps the clearest evidence may be found in the remarks of European migrants to America, who generally appreciated their new-found freedom and sometimes wrote home about it. One German worker wrote: “…here you can live well if you only have work, if you go ask for a job here you can say to the foreman or the master, tell me, do you have any work, here they aren’t as proud like at home, you don’t have to go cap in hand like at home…here you’re free to do anything, you don’t have to register with the police when you move in or out, you also don’t have to pay any taxes.”

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Intensity as a Workplace Public Good

Of course not all American workers preferred such long-hour, high-intensity jobs. Much of the history of the conflict over control of the workplace may be interpreted as a reflection of conflicting priorities between short-term workers and (would-be) longer-term workers. A useful tool here is the concept of workplace public goods. Strictly speaking, workplace public goods are job attributes such as room temperature or air quality that are common to all employees at a given work site. One reason for uniformity would be the presence of a central power source for a factory, so that all of the machinery must start and stop at the same time, dictating both a standard work day and a common work pace during these hours. One need not take this concept literally to understand the powerful pressures toward standardization. Gregory Clark makes a persuasive case that the establishment of “factory discipline” – the rules characteristic of nineteenth century factories specifying hours, conduct on the job, continuous attention to work, and punishment for deviations – was not tightly linked to power-driven technologies.\(^{55}\) This view does not gainsay the presence of workplace public goods. It is in the nature of such systems that they must be strict, standard and uniform. Nothing breaks down discipline faster than toleration of a few slackers.

If job attributes were public goods, then we must ask how their values were selected in a labor market process. Contrary to much traditional labor history, firms could not simply impose terms unilaterally; they had to be sensitive to the response of

labor supply to conditions of work. But if the work force were heterogeneous in its attachment to the job, and in its preferences regarding hours, working conditions, take-home pay, etc., then the “market” outcome was determined by an interaction between costs and the preferences of the marginal workers, those quickest to leave in response to dissatisfaction. If the marginal workers were younger, stronger, more mobile and more focused on immediate cash income as opposed to job security and career opportunities, then these were the preferences that shaped conditions at the workplace. Articulating the priorities of the intramarginal workers through “voice” (as opposed to the “exit” vehicle of the marginals) is one of the central functions of organized unions.56

Martha Shiells applies this framework to the choice of working hours in the British and U.S. iron and steel industries between 1890 and 1923.57 The established collective-choice mechanism of the British industry led quite early to the shorter choice, while under open immigration their U.S. counterparts clung to twelve hours until virtually compelled to change by political pressure in 1923. The tradeoff between hours and take-home pay was not often clearly posed in nineteenth-century labor debates, but when it was, immigrant workers with short-term attachment to industrial work sometimes really did prefer longer hours.58 A century earlier, the high-turnover workers in the Slater-type spinning mills showed no interest in the movement for the ten-hour day.59

58 Ibid., p. 386.
59 Prude, Industrial Order, p. 143.
This analysis sheds light on a whole range of job attributes, such as safety, security of employment, and opportunities for promotion. In each case the prevalence of workers with monetary goals and short-term attachments pushed the outcome towards longer hours, more intense workplace, and immediate rather than deferred payoffs. The recurring influx of new groups of first-generation workers was a distinctive feature of American industrialization prior to 1914, and many aspects of American labor relations may be traced to this influence. This economic structure might seem to have been transitional and temporary, but the scale of industrial expansion and the ongoing eastward and southward extension of the European migration frontier kept the process going throughout the country’s surge to world leadership. The great majority left their home countries with the intention of returning, and although many changed their minds after arrival, large numbers carried out their original plans.\(^6\) As heterogeneous as the immigrants were, their overriding common goal was to accumulate savings. A New Yorker teaching English to Italians asked them why they had come to America, expecting they might reply ‘liberty’ or ‘democracy’; instead, “in one roar they shouted ‘money!’”\(^6\)

One might simply stop the analysis here, attributing differences in management choices between Britain and the U.S. to the varying proportions of long-term and temporary workers in their respective labor forces. But I have in mind a higher-order process, a set of dynamic complementarities among elements of a system, which had the effect of magnifying and perpetuating initial differences between the countries. The high

\(^6\) Susan B. Carter and Richard Sutch document a rising trend in the “immigrant return rate” (departures from the U.S. as a percent of arrivals), from less than 10 percent in 1870 and 1881 to over 70 percent just before World War I. “Historical Background to Current Immigration Issues,” in James P. Smith and Barry Edmonston (eds.), The Immigration Debates (Washington DC: National Academy Press, 1998), p. 305.  
mobility of free labor in the United States induced firms to adapt their jobs to short-term workers, making low investments in skills as a corollary. But this adaptation made industrial work even less attractive to those with long-term aspirations. Development of such labor systems early in the century meant that firms were well-positioned to absorb large numbers of unskilled immigrants, weakening the efforts of incumbents to exercise “voice”. Both the legal regime and the adaptation to it gave employers a positive incentive to seek out new supplies of short-term workers, increasing the homogeneity of the workforce through recruitment as opposed to adjusting conditions to the preferences of the existing pool. Much of the literature discusses these issues in terms of the strength or weakness of labor organizations. But behind the strength of British unions was a strong degree of attachment to industrial work, as well as to particular localities and firms, so that collective pressures had a powerful impact even before the emergence of modern unions. Behind the weakness of U.S. unions lay not just ideology, but the legal construction of free labor and its manifestation as the norm of high mobility.

This conclusion is reinforced by further complementarities implicit in the foregoing discussion. The costs of enforcing long-term labor contracts, for example, depended on the prevalence of such contracts: It was easy to get lost in a society adapted to American-style free labor. Similarly, individual reputation mechanisms were of limited effectiveness in such a world. What did an employer think when a “stranger” walked in the door looking for work? In a world of limited mobility and low turnover, the natural assumption is that something must be wrong with such a person, who will probably not “fit in”. But if the arrival of strangers was an everyday occurrence,
employers had little reason to believe that the new person would not do as well as the incumbents. Indeed, they did their best to design jobs for which this was true.

**Skills, Technology and the American System**

The last link in the feedback loop is technological change. Since Habakkuk, and indeed since the reports of visiting British experts in the 1850s on which Habakkuk relied, observers have tried to interpret American technological change as a substitution of capital for labor, in a setting of labor scarcity. Yet economic historians have had persistent difficulty confirming this hypothesis, because capital as well as labor was scarce in nineteenth-century America, and because the so-called “American System of Manufactures” materialized historically as a complex package, blending such features as standardized products, faster machine speeds, and higher depreciation rates. The most successful syntheses have invoked abundance of American natural resources, postulating complementarity between capital and resources in that era.62 Although much has been learned from this research, something important has been lost from the original, as labor has largely dropped out of the picture.

The treatment of skills in this literature has been persistently inconclusive. Habakkuk noted that American turnover was higher than the British, and therefore that the cost of permanent labor was higher than temporary; yet he concluded that on balance, skilled labor was probably more abundant in America than in Britain.63 This conclusion was upheld in the attempted resolution of the paradox by James and Skinner, not on the basis of wage differentials (which they found to be about the same in the two countries by

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63 *American and British Technology*, pp. 23, 66.
the 1850s), but by limiting attention to a handful of industries in which the U.S. fostered early technological innovation.64 These industries – agricultural implements, furniture, machinery, hardware, nails, clocks, and guns – were characterized by high average wages, taken by James and Skinner as an index of skill. But this list covers only about seven percent of U.S. manufacturing, omitting textiles (to which Habakkuk devoted much of his attention), boots and shoes, and many others that emerged as important later in the century. Further, the James-Skinner “skilled” industries are largely those that generated “American system” technology, not necessarily representative of the system itself in practice. As Rosenberg and Thomson show, much nineteenth century manufacturing technology originated outside of the adopting industries.65 Recent analyses by Goldin and Katz and by Acemoglu find that a distinction between technology-generation (machine installation and maintenance) and technology use (production) is essential to interpreting U.S. technological change in the nineteenth and twentieth centuries.66

The idea that a defining feature of American technology was the use of machinery to substitute unskilled labor for scarce craft skills has not been entirely neglected. It was advanced for the Edwardian period by C.K. Harley,67 and reiterated with somewhat broader scope by Broadberry and Grantham.68 Contemporary testimony along these lines

was widespread. In the classic reports by visiting British engineers, reference to the
scarcity of craft skills is at least as prominent as the more generalized “labor scarcity”
thesis. For example, Mr. George Wallis wrote as follows:

Thus the very difficulty in procuring human labour, more especially when
properly skilled and disciplined…appears to have stimulated the invention
of the few workers whose energies and skill were engaged in the early
development of manufactures; and to this very want of human skill, and the
absolute necessity of supplying it, may be attributed the extraordinary ingenuity
displayed in many of these labour-saving machines, whose automatic action so
completely supplies the place of the more abundant hand labour of the older
manufacturing countries.69

The early U.S. adoption of ring spinning over mule spinning is well-known. Mule
spinners were skilled adult males, while ring spinners were young female machine-
tenders, frequently replaced. The 1842 “stretch-out” at Lowell from two looms per
weaver to three was associated with a switch from literate Yankee farm girls to illiterate
and Irish workers.70 At the innovative Collins Company in the 1840s, Elisha Root’s
shaving and forging machinery reduced the need for experienced grinders and strikers in
axe manufacture.71 In boots and shoes, the McKay sewing machine overcame the
constraints of craft labor and the apprentice system.72 Machinery for cutting and grinding

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cutlery was introduced in the 1860s, displacing skilled cutlers from Sheffield. In shipbuilding, mining, metalworking, and later iron and steel, American practices were more mechanized and required less skilled craft labor than their British counterparts.

Perhaps the reason that this relatively straightforward portrayal has not found ready acceptance is that economists have tried to pound the topic into a Heckscher-Ohlin framework of relative factor endowments, distinguishing skilled and unskilled labor as factors of production whose relative scarcity ought to be reflected in their market prices. But if the technology emerged from a dynamic process of complementarity, arising from and reinforcing institutional differences in the attachment of employees to employers, then this process will not be tracked by the price of skill in the labor market. Because craft skills are intrinsically specialized, there is no true comparability between skill premiums across countries, nor between one type of skill and another. Even if these measurement problems could be waived, we would still face a basic indeterminacy. On the one hand, supplies of craft workers were scarce in the U.S., and the mechanisms for replacing them were disintegrating. But on the other hand, the processes of substitution were continually reducing the relative demand for such skilled labor, so that one cannot say what relative price to expect at a point in time.

The contrasting positions of the two countries may be characterized by the curves in Figure 3, relating the percentage of skilled operatives in the labor force to the direction of technological change, where “skill” refers to traditional craft training, as opposed to other dimensions of labor quality. The 45-degree line represents a set of equilibrium positions in which the percentage of skilled operatives matches the “optimal” engineering

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position embedded in the technology. The intersection at the center is one of these
equilibria, but it is unstable. To the right of this point, the UK responded to the positive
payoff by training more skilled craft workers and adapting the technology to this skill
mix. To the left, US industry simultaneously adapted to the relative absence of skilled
workers and reinforced that absence in so doing. The diagram highlights the functional
dependence between design and relative numbers, but the positions of the two countries
would also be affected by institutions, and by opportunities available to workers.

This analysis does not imply that all American technology was “deskilling” in
character, nor that craft workers as a class were displaced. In papermaking, for example,
mechanization did not eliminate the jobs of most skilled workers, though it greatly
increased the relative number of less-skilled machine tenders.74 Most machine tools
firms were flexible and accommodating to their high-mobility, individualistic,
mechanically expert employees, even while designing a manufacturing technology that
displaced older skills and created routinized, semi-skilled jobs. Elsewhere in the
economy, expanding sectors such as trade, finance, communications and government
drew increasingly on educated and professional personnel.

Above all, nothing in this analysis assures that a country with this type of “free
labor” would actually succeed in developing a successful technology. Initially, the U.S.
response may have been no more than a second-best adaptation to a constrained and
inefficient labor market situation, as most British experts believed in the 1850s. By the
end of the century, U.S. technological leadership extended to many more industries, but
by that time there were additional advantages that could not be replicated in European

74 Judith A, McGaw, Most Wonderful Machine: Mechanization and Social Change in Berkshire
countries, such as the size of the domestic market and the growing relative abundance of minerals. As Clark points out, the payoff to more intense factory discipline was greater, the larger the fixed-capital investment. Studies of early American industrialization find that both intensity of work and the woman-child component of the workforce (arguably a good proxy for impermanence in that era) were systematically higher in large factories than in smaller artisan shops. In the latter part of the century, the average establishment wage (a proxy for low skill intensity) was inversely related to establishment size, accounting for much of the observed increase in wage dispersion. Thus, skill-saving, effort-using aspects of the system may have been complementary to other dimensions of American technology. The gradual rise over time in the efficient scale of mechanized plants suggests an incremental learning trajectory such as that depicted in Figure 3.

In European countries, not only was the “initial endowment” of skilled craft labor ahead of that in the U.S., but institutions were maintained that facilitated the replication and advancement of these skills. Apprenticeship was one such institution. In contrast to the U.S., breaches of apprenticeship contracts in England were highly unusual. The same was true of French Canada, confirming that labor market norms were not directly driven by the high land-labor ratios of the New World. Gillian Hamilton reports that in Montreal, no more than two percent of apprentices ran away from their contracts between 1791 and 1820, the very period when the institution was said to be breaking down in the

U.S. Enforcement was most commonly assured by the presence of a sponsor, usually a family member, who bore the financial risk and hence had an incentive to oversee successful completion of the contract. Such sponsorship was not standard practice in the U.S. The implication is that the decline of apprenticeship was not a simple function of technological trends, but also reflected deeper changes in U.S. family relationships.

Skilled labor was also recruited through less formal arrangements, such as “learnerships,” or “following up” a work crew to receive instruction while working. Very often recruitment was within a family, typically of sons by fathers. In the 1890s, a French visitor was particularly struck by the absence of such family-based recruitment in America. In France and Germany, these traditional forms of skill acquisition were supplemented by technical schools, operated by or in close association with employers. All of these methods of training have in common an element of commitment on the part of the trainee. But it oversimplifies the matter to say that these institutions persisted only because European labor was “less mobile” than American, because the existence of these types of opportunities for young men was itself one of the reasons for lower mobility.

Charles Sabel and Jonathan Zeitlin describe a scenario in which young men began their training in local- and/or family-based skill networks quite early, well before their major life decisions had been made: “The central and defining experience of each new generation was automatic and collective induction into local industry.” Technological communities of this type were not entirely absent in the nineteenth-century U.S., but these were not the features that emerged as characteristically American.

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80 Emile Levasseur, *The American Workman* (Baltimore: Johns Hopkins University Press, 1900), p. 64: “Unlike Europe, there is no district where an occupation descends from father to son.”
Conclusion

Jan de Vries’s Industrious Revolution resonates evocatively with the main currents of American economic history. Colonials in all parts of mainland North America were eager participants in the consumer revolution of the eighteenth century, channeling their energies towards cash income, with which to enjoy the latest goods from across the Atlantic. Long hours and high effort levels were rewarded, and became enduring features of American life. With the important exception of African slaves, most of this energized activity took place within nuclear family producing and consuming units. Rising industriousness may plausibly be related to the growth acceleration of the early national period, as in Paul David’s calculation that more than half of antebellum per capita income growth was attributable to increased labor effort (manhours). In modern times, the U.S. continues to be an outlier in hours of work, mobility, and job turnover.

As argued here, however, the de Vries framework requires adaptation for distinctive features of the American setting. Although the original colonies were affluent consumers by world standards, the post-Revolution opening of the west to commercial farming created vast new opportunities for social and economic advancement, launching a succession of “market revolutions” that continued through the nineteenth century. Consumer comforts may have been the ultimate household goals, but the immediate effect of high geographic mobility was to threaten or undermine established family relationships. Nonetheless, the realistic prospect of attaining farm ownership (or another comparable status) supported both high turnover and high effort levels in American factories. The argument of this essay is that a pervasive “norm of mobility” became

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embedded in law and expectations, shaping labor relations, working conditions, and ultimately the direction of American technological change.

This transition is sometimes seen as a substitution of individualism for family values. The nuclear household, however, continued as the basic consuming unit and the object of life-cycle plans for most American men and women. The cultural roots of the breadwinner-homemaker household reach far back in American history, so that twentieth century reformers could claim it as a national tradition that men support their families.
Table 1.

**Occupational Distribution of Wage-Earning Women in Massachusetts, 1837**

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palm-leaf hats and Straw bonnets</td>
<td>48.6</td>
</tr>
<tr>
<td>Textiles</td>
<td>17.3</td>
</tr>
<tr>
<td>Boots and Shoes</td>
<td>14.4</td>
</tr>
<tr>
<td>Domestic Service</td>
<td>11.6</td>
</tr>
<tr>
<td>Teaching</td>
<td>3.6</td>
</tr>
<tr>
<td>Garments</td>
<td>3.0</td>
</tr>
<tr>
<td>Miscellaneous Other</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Total Women Employed    105,977

Figure 1

Colonial Imports from England & Scotland
1693-1774

Figure 2

**U.S. Agricultural Output per Worker**

1800-1900

"Broad" Output

"Narrow" Output

Figure 3. Dynamics of Skill and Technological Change, US-UK