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Wage Trends, 1800–1900

STANLEY LEBERGOTT

BUREAU OF THE BUDGET

> . . . like those architects, pupils of Viollet-le-Duc, who, fancying that they can detect, beneath a Renaissance rood-loft and an eighteenth-century altar, traces of a Norman choir, restore the whole church to the state in which it probably was in the twelfth century.—*Swann's Way.*

Aside from the interest that inheres in any search for our national origins, the economic trends of the nineteenth century have direct relevance to our own era. For one thing, this was a period of major growth and change. Today's macro-economic analysis tends to focus on changes in resource use during only a few decades, usually when relatively slight shifts occurred aside from massive government intervention or incentive. Data for the twentieth century must be intensely accurate, and analysis must range from the astute to the abstruse if we are to detect other causal factors and link them to changes in resource use. In the nineteenth century, however, Herculean transformations occurred and the task of attributing cause to result is simpler.[1]

A second aspect of special contemporary interest is the effective analogy that this period offers for the dissection of Soviet economic change and the study of underdeveloped countries. The nineteenth century surely constitutes a much more relevant historical analogy for such study than does the United States during the 1920's, or even the early 1900's. Indeed, a period in which a large slave population was a significant resource element and major political factor is particularly appropriate for the study of Russian developments.

A third aspect of contemporary relevance is the substantial extent of government intervention in the economic process by way of tariff protection, Henry Clay's "American System," and so forth—a tradition that lapsed for a few decades early in this century but was reinvoked in 1932 under the impact of twelve million unemployed.

The present paper is divided into three sections. In the first, a few yeasty generalizations on the economics of the labor market are attempted, using as a starting point the wage series developed in later sections.

[1] This point, made here with respect to development over time, is identical with that made with respect to contemporary structural analysis by Trygve Haavelmo, *A Study in the Theory of Economic Evolution,* North Holland Publishing Co., 1954, p. 5.

In the second section (page 462), the main lines of wage rate changes during the nineteenth century are adumbrated in so far as the present data reveal them (summarized in Table 2, page 462). The third section (page 471) offers detailed estimates for particular periods, industries, and occupations, together with an outline of the sources and methods utilized to arrive at these estimates.

The Economics of the Labor Market

IMPACT OF DEMAND ON WAGE RATES

The impact of labor demand and supply on wage rates in the early nineteenth century operated within institutional relationships set up by the historical tradition. Thus the consumption pattern of the colonies and the Confederation for manufactured goods was oriented toward products imported from England. When manufacturing developed in the early nineteenth century, it was aimed at superseding English imports. It did so by adopting English production patterns, technical methods, and—almost inevitably once these were given—by tending toward the characteristic English occupational patterns.

When Samuel Slater came to Rhode Island in 1790, he brought not merely English equipment plans but English production patterns; for example, the tradition of hiring large numbers of children for factory work. The first operatives hired by Slater were seven boys and two girls, aged between seven and twelve.[2] In 1833, 50 per cent of the employees in Slater's Steam Cotton Manufacturing Company were children.[3] This pattern was adopted in the early Rhode Island factories. But the tradition was not suited to American conditions of supply and demand and fell upon infertile soil. With 20 per cent of adult employment in cotton textiles in 1833, Rhode Island had 60 per cent of New England's child workers. Massachusetts, which became the leading textile and manufacturing state, filled only 10 per cent of the cotton mill jobs with children.[4]

The Early Period

The result of concentrated demands for labor and dispersed supplies is most obvious in the early stages of industrialization. The typical cotton or wool manufactory in the first third of the century was, of course, the American home with only a few workers. Most factories, too, had but few workers. Even by 1833 typical Massachusetts factories

[2] V. S. Clark, *History of Manufactures in the United States*, McGraw-Hill, 1929, Vol. I, p. 397.
[3] *Documents Relative to the Statistics of Manufactures in the United States*, Duff Green, 1833, Vol. I, p. 951; hereafter referred to as *Documents*, 1833.
[4] Based on a totaling of reports in *Documents*, 1833.

reported 12, 15, 101, 81, 28, 221, and 19 employees. Amidst these Lilliputians the giant cotton mills stand apart: the Lowell mills with 290, 480, 826, and—in the Merrimac Mill—1,443 employees; and such New Hampshire firms as Great Falls with 1,382; New Market with 672, or Cocheco with 1,075.

Associated with the enormous size of these establishments was the need to draw employees from some distance away. Local labor supplies were nowhere near adequate. One result was the black "slaver's wagon" of New England tradition, recruiting labor for the mills. The other was the distinctly higher wage rate paid by such mills in order to attract labor from other towns and states. Humanitarian inclinations and the requirements of labor supply went hand in hand. Thus while hundreds of small plants in New York, in Maine, and in Rhode Island paid 30 to 33 cents a day to women and girls, the Lowell mills generally paid 50 cents.

This differential did not evidence differences in cost of living, or generally higher Massachusetts rates. It reflected primarily supply costs. This can best be seen by the fact that hundreds of women throughout the state were paid only 25 to 30 cents a day for weaving palm leaf hats, the same rate as was paid in other New England and Middle Atlantic states. Female rates in Massachusetts shoe factories, typically small, and typically manufactories, also ranged from 25 to 30 cents. (We can derive a simple measure of the disutility and costs associated with working in large factories, being far distant from home, and so forth, by comparing the 44 cent rate generally paid females in Massachusetts cotton mills, or the 50 cents in the giant mills, with this 25 to 30 cent a day rate.) In general the factory discipline commanded a premium wage over home work and the putting-out system.[5]

The impact of high demand is equally apparent in the rate paid to children in Rhode Island mills. Rhode Island accounted for 60 per cent of all children employed in the New England cotton mills, and although its rate for females was among the lowest for any northeastern state, its rate for children was well above the median for these states.[6]

The reverse of this pattern gives a strong confirmation. The demand

[5] Women's factory earnings ran from $2 to $3 compared "to what might be earned in their usual occupations at one dollar and a half per week." Albert Gallatin, Chairman, *Memoir of the Committee Appointed by the Free Trade Convention, Philadelphia, September–October 1831*, 1832, p. 20. Cf. also Matthew Carey, *Twenty-one Golden Rules to Depress Agriculture, Impede the Progress of Manufactures . . . by a Pennsylvanian*, Salem, 1824, and *Remuneration for Female Labour, To the Editor of the New York Daily Sentinel*, March 18, 1830, in which Carey reports 1,100 women working for the Provident Society of Philadelphia in the winter of 1828–29 averaging 50 cents a week "recompense" according to Mary Queen, matron of the society. Carey indicates a usual wage of $1.25 a week.

[6] The small number of children employed in New Hampshire, Vermont, and possibly Connecticut makes somewhat uncertain the reliability of the average for children in those states. They were therefore ignored in making this comparison.

for male employment was nothing like as geographically concentrated as that for females, and the rates paid differed little among the several northeastern states. (Not that the whole level of wage rates was unaffected by these demands. One need only refer to the bitter protest of Representative Hudson of Massachusetts, who flatly stated that factory operatives "were taken chiefly from the agricultural class, and when they were withdrawn wages rose."[7])

Once the labor supply had been recruited, and the level more or less stabilized, the acute need for a differential passed. Although the data on this point are exiguous, it appears that the wage rates paid the Lowell girls dropped sharply after the initial period, from 67 cents in 1828 to 50 cents a day in 1840 for weavers in one mill, and from 64 cents to 55 cents over a briefer period in another.[8] While rates for other occupations showed different trends, the fact that an overwhelmingly large segment of female employment was in the weaving group makes this rate change suggestive.

The Frontier

A well-known aspect of demand is the impact of the frontier. Although advice may have brought some young men to go West, the impact of wage rates and incomes probably attracted many more. The differentials between regions and states that still exist were even more marked during the period of development. For labor had to be attracted hundreds and thousands of miles away from its source, whether that source was a homestead in Vermont or a ship landing in New York. The rate paid farm labor (monthly with board) in Illinois was $12 as compared with $8 to $9 for Ohio and Indiana in 1818 and 1830. And the frontier territory of Minnesota in 1850 paid rates 70 per cent above more settled Iowa, Missouri, and the East North Central region.

The classic case, of course, is California in the Gold Rush days. California farm hands in 1850 earned $60 a month, 400 per cent above the rates paid in the Midwest. (Any further advantages accruing from proximity to the mines are, happily, not measurable and, presumably, kept the rate from being still higher.) While the frontier may not have been closed until 1890, the gap in the wage rates reached a minimum shortly after the Civil War. California rates fell by 30 per cent from 1850 to 1870, while New England rates rose by 40 per cent. For the

[7] *Congressional Globe*, 1842, p. 60.

[8] The rates for weavers in the Merrimac mill appear in *1880 Census of the United States*, Vol. xx, Joseph D. Weeks, *Report on the Statistics of Wages in Manufacturing Industries*, p. 349; hereafter referred to as the Weeks Report. For the other Lowell mill, cf. *1880 Census*, Vol. ii, *Report on the Manufactures of the United States*, Carroll D. Wright, *Factory System of the United States*, folio p. 576; hereafter referred to as the Wright Report. He gives 1828 figures for "two of the best known factories in Massachusetts" and 1836 figures "for the same factory." His language suggests that he may have been referring to the Hamilton and Appleton mills, which were jointly run at one period, separated later.

next seventy-five years the two rates maintained a rough parity of movement, a gap only reappearing under the pressures of World War II production and the second westward migration. Rates in the West South Central frontier had also stopped their marked decline by 1870, moving parallel to other rates in subsequent decades.

New versus Old South

While it is difficult to make any exact calculation, the probability that mere chance accounted for South Carolina's being the leader in the Nullification Controversy of 1833 and the secession in 1861 is slight. Assuming ten states with a generally southern orientation in 1833, and at least that many in 1861, the joint probability of the same state being first to act at both dates is less than one in one hundred. The farm wage rate figures, and in a broad way laborers' earnings, illuminate one aspect of such economic factors as were involved.

A protectionist group contended in 1833 that "It is idle to suppose that the sickly climate and sterile soil of the lower sections of Carolina or even the healthful but thin uplands of the same States, should be capable of sustaining a competition in the cotton culture with the new regions of Alabama, upper Georgia, Tennessee, Mississippi and Louisiana, teeming, as most of them do, with the fat forests of a soil of inexhaustible treasure—a soil that united the miraculous fertility of Egypt with the bland beauties of Tuscany. It is vain to expect from Virginia, situated on the doubtful latitude that renders the crop a matter of accident, and struggling too, with the reluctant bounty of a worn out soil, successfully to erect her head in this competition."[9] The pedestrian reports on farm wage rates are consistent with this perfervid description:

	Average Monthly Farm Wages		
State	1830	1850	1860
		(dollars)	
South Carolina	7.00	7.72	11.37
North Carolina	6.00	7.21	10.57
Virginia	6.00	8.43	11.43
Alabama	9.00	9.62	12.41
Georgia	12.00	9.03	11.95
Louisiana	—	12.80	17.00
Mississippi	10.00	11.00	16.66
Texas	—	12.00	16.02

[9] *Memorial of the Permanent Committee of the New York Convention of the Friends of Domestic Industry*, 22d Cong., 2d sess., 1833, Doc. 78, p. 15. The language is undoubtedly the work of one of the co-secretaries, J. P. Kennedy, the novelist, author of *Swallow Barn*. The best known discussion is, of course, to be found in Avery Craven, *Soil Exhaustion as a Factor in the Agricultural History of Virginia and Maryland, 1806 to 1860*, Urbana, University of Illinois.

The rate for Florida was probably about $12 in 1833.[10]   None of the rates, it will be realized, relate merely to the "new regions," where the averages would presumably be still higher.   A 100 per cent range in wage rates over so limited an area is consistent with the direction of flow of the slave trade and reflects the comparative disadvantage under which the older cotton states labored in the competition of the market.[11]

FRICTIONS IN THE LABOR MARKET

Coordinate with the development of classical theory on supply and demand was the realization that institutional tendencies will affect the operation of these forces.   The immobility of labor in England in the late eighteenth century was ascribed by Smith largely to the impact of the poor law administration and other restrictions.   In later years Mill and Cairnes emphasized discontinuities in the labor market; it is these that are most apparent in the American data.

Discontinuity

Early examples of simple geographical differences abound in the 1832 reports (*Documents*, 1833 passim).   In New Hampshire, for example, the rates paid females in cotton textile manufacturing were 63 cents in Peterboro, 40 cents in New Ipswich, $37\frac{1}{2}$ cents in Winchester, and 42 cents in Jaffrey.   The towns were all within one very limited area yet there was a 66 per cent spread in rates.

The differences certainly do not reflect mere happenstance variations. In some measure higher wages indicated payment to a more productive group of workers, to those working on finer fabrics, and so forth.   On the other hand, it is hard to believe that a range from 40 to 63 cents at this period does not also reflect marked discontinuities in the free competitive labor market.

It is necessary to recognize that this early period may have been one of pure competition, but not necessarily perfect competition.   When walking was the only practical means of getting to work and mills opened between 5:30 and 6:30 in the morning, women were not likely to walk miles in order to maximize the week's paycheck.   It is difficult to put ourselves wholly into a period in which women walked barefoot to the meeting house to save their shoes, putting them on only when entering.

[10] The state rates are from data used in preparing Table 2 except that for Florida. Captain Drane of the Second Artillery estimated repair costs for Fort Marion, indicating that laborers could be hired at $12 a month, mechanics at from $1.50 to $2.00 per day (22d Cong., 2d sess., 1833, Doc. 62).

[11] It is assumed that in a generally free market such wages, though relatively high as a cost element, would be associated with relatively high returns on investment as well.

Slavery

The most obvious limitation on the flow of labor between occupations and areas in this period was the institution of slavery. Yet there are enough individual examples of slaves being hired out by their owners and being used in factories as well as on farms, enough transportation of slaves to choicer markets, to make one wonder how great a wage differential did exist.

One contrast can be made for 1832. In describing slave labor, Calhoun's Congressional lieutenant and one of the greatest southern thinkers on the subject, Representative McDuffie of South Carolina, spoke of "efficient agricultural labor operating at 12½ cents a day and producing one of the most valuable staples on the earth."[12] This means a wage (in kind) of $3.75 a month, compared to the $7.33 plus board paid to free agricultural labor in the South Atlantic area.

In the light of other data on costs and returns for slave holding, we can conclude that the wage other than board (i.e. clothing, medical care, lodging) ran to about $15 a year to slaves.[13] This compares with about $90 (12 times $7.33) for hired agricultural labor in the South Atlantic area. A cost calculation for the slave system as a whole, outside the scope of the present paper, could be made from the Smith and the Conrad and Meyer studies. It should be noted that when one begins to add to out-of-pocket costs, such items as maintenance costs for non-field hands and depreciation, many offsetting considerations come in—the values of land clearing by slaves, of their natural increase, of the price rise for slave owners' inventories; the fact that "nearly all planters manufactured the greater part of the clothing they used," the contribution of quarter hands in picking and household work, and so forth. The direct contrast for full task hands is a direct and informative measure; and the sixfold advantage to free as against slave labor measures one aspect of this friction in the labor market.

Abolition of Slavery

But perhaps the most spectacular example of such friction appears in the 1860–70 decade of the war and its immediate aftermath. The change over that decade in daily (or monthly) earnings of three key occupations was the following:[14]

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[12] *Congressional Register*, May 28, 1832, cols. 3137, 3140.

[13] Estimates of $3.46 for out-of-pocket costs for a Carolina planter, of $17.50 to $44 for all costs, appear in Robert Worthington Smith's study, "Was Slavery Unprofitable in the Ante-Bellum South?", *Agricultural History*, January 1946. The present estimate relies on a breakdown of costs for what would be one of the highest cost areas, Louisiana, in 1829 and again in 1846, when the bias of the group concerned would have been to set costs at a maximum, and for South Carolina in 1846. A similar estimate is arrived at by Alfred H. Conrad and John R. Meyer, "The Economics of Slavery in the Ante-Bellum South," *Journal of Political Economics*, April 1958, Table v.

[14] The data lying behind Table 2 were used.

Occupation	South Atlantic	East South Central	West South Central
	(dollars)		
Carpenters	+23	+31	+27
Nonfarm laborers	+6	+9	+9
Farm laborers	−2	−2	−2

Despite the addition to the free labor market in the South of millions of additional workers, the rates for carpenters rose fully as much as in northern regions. Rates for nonfarm laborers likewise rose by about a third—distinctly less, but not spectacularly less, than the rise of 50 to 60 per cent in the North. The millions of ex-slaves competed, it is clear, primarily in the market for farm labor; and whereas rates in the other occupations rose markedly, the rates in this market fell markedly over the decade. (We refer here to hiring rates for farm labor. Real incomes very probably rose since most farm laborers in this market after the war had been slaves before the war, their imputed income being well below the 1860 hiring rates used as a base for estimating these changes.)

ORGANIZATION OF THE LABOR MARKET: REAL WAGES IN THREE WARS

The combination of increasing communication and control that has attended the growth of this country has evidenced itself in the form of government intervention and concerted private action. In the labor market one reflection of its impact is suggested by the contrasting trend of manufacturing wages and prices in three wars:[15]

		Manufacturing	
Period	Cost of Living	Money Wages	Real Wages
		(per cent)	
1860–65 (North)	+63	+43–51	−14
1914–18	+57	+69	+12
1940–45	+28	+76	+48

These data show opposed trends at work: money gaining successively more over each period, prices gaining successively less. During the Civil War real wages fell despite wartime labor demands and the beckoning opportunities of the West. In World War I prices gained almost as much as in the Civil War, despite the limited price and wage control program, but wages rose distinctly more. In World War II

[15] *1860–65:* Price data for the eastern states appear in Wesley C. Mitchell, *Gold, Prices, and Wages under the Greenback Standard,* University of California Publications in Economics, Vol. I, March 27, 1908, p. 89. The wage data are those shown in Table 2. *1914–18:* Paul Douglas, *Real Wages in the United States,* Houghton Mifflin, 1930, pp. 60 and 246. *1940–45: Business Statistics,* Dept. of Commerce, 1955 edition, pp. 26 and 69.

wages rose still more as ten million men were removed from the labor market, but the striking jump in real wages resulted from the markedly smaller gains in the cost of living as a broad price control program was enforced.

The decline in real wages in the Civil War period, marked in the North and even more so in the South, and the substantial post-1865 growth in output cast an interesting light on Keynes's thesis (later adapted by Earl Hamilton) that the cost-price spread was a basic source of economic growth.[16] On the other hand, World War II, with its steep wage gains, was also followed by a substantial growth in output, price control and wartime savings having provided a reservoir of purchasing power for the postwar years.

A second aspect of the organization of the labor market can be seen in the lag of wages behind prices. Both in the Civil War and in World War II, wages lagged one year behind prices. But the slope of this relationship was significantly different, and that difference reflects the complex of government and private action.

WAGE DIFFERENTIALS

Occupation and sex differentials can be contrasted for the North Atlantic region at four dates encompassing some of the dominant changes in the century: 1815, 1825, 1850, and 1870 (Table 1). For 1815 the estimates appear in *A Review of the Trade and Commerce of New York from 1815 to the present time with an inquiry into the causes of the*

TABLE 1

Occupational and Sex Differentials in Average Daily Earnings,
New England, Selected Years, 1815–1870

(dollars)

	MALES					FEMALES	
Year	Farm Labor[a]	Nonfarm Labor	Mason	Carpenter	Cotton Textiles	Servant[b]	Cotton Textiles
1815[c]		1.00	1.75	1.50			
1825	8.50	1.00	1.62	1.45	1.08	4.33–6.50	0.41
1850	12.98	1.05		1.40	0.85	6.06	0.51
1870	19.87	1.56	3.50	2.97	2.00	10.87	1.19

[a] Monthly, with board.
[b] Weekly, with board.
[c] New York.

The sources of figures in this and the following tables are given in the accompanying text and text footnotes.

[16] J. M. Keynes, *The Economic Consequences of the Peace*, 1920, pp. 18ff. and Earl J. Hamilton, "American Treasure and the Rise of Capitalism," *Economica*, 1929, Vol. 27, pp. 338–357. Later discussions by Nef, Alchian, Kessell *et al.* are sharply critical.

present distress and the means of obviating it, by an observer.[17] They are consistent with Zecariah Allen's data for 1825 and seem of tolerable reliability. For 1825 the figures are estimates of Allen.[18] His estimates are reasonably consistent with other sources (so far as showing differentials are concerned) but were supplemented in a few occupations where he provides a range.[19] For 1850 we have a variety of data provided in the 1850 census, requiring only weighting to afford us a New England average.[20] For 1870 the data are from the Young Report, except the rate for females in cotton textiles, which was estimated from Bishop's data.[21]

Occupational Differentials

The resultant estimates indicate a doubling from 1825 to 1870 of money wages for masons, carpenters, farm labor, mule spinners, and servants. Hence, the percentage differentials among these groups remained unchanged over half a century. Two reliably distinct exceptions appear.

1. Common labor (nonfarm) gained little more than half as much as these other occupations. Although the Wright Report data for Massachusetts wages over this period conflict with the present estimates in some particulars, they too show relatively small gain in common labor as compared with skilled, the retardation arising primarily in the 1850–70 decade.[22] It is difficult to attribute this lower rate again to anything but the immigration of unskilled labor. For while general demand and cost

[17] C. S. Van Winkle, 1820.

[18] Zecariah Allen, *The Science of Mechanics*, 1829, p. 347.

[19] He estimates farm wages at $8 to $10, mule spinners' at $1.08 to $1.40, and female cotton operatives' at $2.00 to $2.50. Instead of taking medians, the 1832 data, computed from *Documents*, 1833, for New England, were used. The absolute level of his common labor rate seems high when compared to Wright's Massachusetts data for 1825 (Carroll D. Wright, *History of Wages and Prices in Massachusetts, 1752–1883*, Massachusetts Bureau of Labor, 1885). However, the latter provides no very conclusive contradiction.

[20] The data are described for individual occupations and for cotton textiles except for servants. For the latter group the census does not report the number of female employees so that for combining the state rates in New England, the number of male servants (*The Seventh Census of the United States: 1850* (1853), pp. 11, 25, 40, 58, 71, and 83) was used. This procedure gives substantial allowance for the importance of Boston, Providence, and other large cities.

[21] Edward Young, *Special Report on Immigration*, 42d Cong., 1st sess., 1871, Exec. Doc. 1, pp. 202ff., hereafter called the Young Report. J. Leander Bishop, *History of American Manufacturers, 1608–1860*, E. Young and Co., 1868, Vol. III, p. 314. To Bishop's $3.60 for the Lowell Mills in 1867, I add board amounting to $2.50, using the figure for Massachusetts given in the Young Report, p. 224. The resultant $7.10 is almost equal to an average of the Massachusetts rates for spinners and weavers given by Young.

[22] Wright, *History of Wages*, pp. 278–279. Averaging Wright's data for decades ending 1820 and 1830 to derive a rough 1825 figure, using his decade ending 1850 for 1850, and that ending 1880, shows significantly differing 1825–50 movements; marked gain for carpenters, marked stability for farm labor, the same stability for common labor, and for masons. But his 1825–80 rise of 100 per cent for masons, and the 110 per cent for carpenters, contrasts with only 70 per cent for common labor and 40 per cent for farm labor.

factors would have impinged on all rates, the damping of merely the laborer's gain certainly calls attention to the most likely cause (errors in statistics aside): massive immigration.

2. Rates for females in cotton mills tripled, gaining by a larger percentage than any other occupation shown here. One could readily explain this by reference to the low 1825 level, making the possibility of a larger percentage gain as easier matter, as we have more recently seen in other low wage occupations. However, the rate for servants is an even better candidate for such an explanation—and it does not seem to have been such an exception. Whether it is the inclusion of board in the latter's wage that explains this inconsistency, whether the data are simply inadequate, or whether some *tertium quid* is involved is not clear.

A further aspect is the broad stability that persisted for most of these rates from 1825 to 1850, broken only by a decline of male earnings in cotton textiles, and by the substantial rise in farm labor rates.

Sex Differentials

Over the century a drastic reduction also occurred in the spread between earnings of males and females in the same industries. This generalization can be documented for the three manufacturing industries that encompassed most female employment in 1832: cotton textiles, woolen textiles, and boots and shoes.[23] From 1828-32 to 1900 the decline for each industry was substantial, and all but identical.[24] These trends are substantially inconsistent with those reported in Layer's study, for he finds "no significant trends in the data" on differentials.[25] Layer, however, draws this conclusion from a comparison between the carding department and spinning department averages, taking the former as indicative of the trends for male rates and the latter, for female. Though broadly reasonable, this comparison makes no allowance for the substantial upward trend for the extremely large group of female weavers, a group at least as numerous as spinners, or for the downward trend of male rates in other departments.[26] A proper

[23] The 1832 data were computed from *Documents*, 1833. The 1900 figures are from data in *1900 Census of the United States*, Vol. VII, *Manufactures*, Part 1, pp. 96, 176, and 460.

[24] For the woolen industry we can even go back to 1828, at the very beginnings of its existence on a substantial scale, and the ratio seems to have been much the same as in 1832. Data for individual plants appear in the *Minutes in Evidence before the Committee on Manufactures* (20th Cong., 1st sess., 1828, H. Rep. 115). The ratio can be computed for six woolen plants and one cotton plant. For two plants that have exceptionally high ratios, it is possible to compute a ratio from data for 1832 and 1846 respectively in later reports. These ratios are identical with the 1828 ratio, suggesting a wide distribution around the norm at both dates.

[25] Robert G. Layer, *Earnings of Cotton Mill Operatives, 1825–1914*, Harvard University Press, 1955, Table 13, p. 51.

[26] Layer (p. 52) shows rates for the weaving and dressing departments. The upward gains for weavers can be attributed to females since most weavers were female. The downward trend for dressing in part reflects that for males in that department.

weighted average of Layer's data would probably show much the same trend as noted above.[27]

WAGES AS A COST

One of the most fascinating aspects of the wage rate data for the nineteenth century is the insight they can offer on the way in which manufacturers shifted factor proportions and installed capital, keeping labor cost rises lagging behind wage rate rises. The data presented here cannot carry generalization far but a few examples may have some heuristic value.

1. Data for the Massachusetts cotton mills enable us to contrast the changing sex-differential in wage rates with the changing proportions employed:[28]

Massachusetts

Year	Female Earnings as a Percentage of Male Earnings	Female Employment as a Percentage of Male Employment
1832	42	158
1900	77	91
1952	94	73

As the comparative advantage of female rates over those for males diminished, the ratio of female to male employment fell drastically. The enormity of the change from 158 to 91 per cent should be emphasized. For although the earnings change continued over the next half century, a not much longer period, the ratio of female employment appears to have fallen only slightly.

2. From 1832 to 1850 female rates in cotton textiles rose by more than 20 per cent (Lowell rates rising by 25 per cent) but the average for both sexes changed by only one penny (Table 2, below).

3. From 1860 to 1866 rates for comparable age and skill groups in cotton textiles rose by 90 per cent, but the weighted average rose by only 66 per cent.[29]

4. From 1850 to 1860 the great Merrimac Mill offered rates for weavers and spinners—two groups accounting for most female employment—that remained essentially unchanged (Weeks Report, p. 349).

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[27] His figures for 1830–34 rest on data for only two companies and are not satisfactory. The direct ratios shown in his Table 13 are misleading for level (men's rates were certainly more than 12 per cent above those for women in 1835–44) but they are, of course, only presented to indicate trends.

[28] The 1832 data are based on a summary of the reports from *Documents*, 1833. The 1900 figures are based on the 1900 census (Vol. VII, Part I, p. 176). The 1952 data relate to New England generally. The wage data appear in the *Monthly Labor Review* (August 1952, p. 147), while the employment data were kindly provided by Earl Lewis of the Bureau of Labor Statistics.

[29] David A. Wells, *Report of the Special Commissioner of the Revenue*, 1867, hereafter called the Wells Report.

However, the average earnings of females as a group fell by 10 per cent (original census schedules).

5. From 1889 to 1899 average annual earnings of employed males in cotton textiles changed trivially in the North and in the South, but the national average fell by 8 per cent as the industry shifted to the lower paid areas.[30]

In these instances we see reflections of the same process: rising rates, shifting proportions of labor employed in the various occupation-sex categories, and much smaller gains in average hourly earnings (and possibly costs) than in the rates.

Associated with shifts within occupation-sex categories were increases in productivity brought about by increased capital investment. In the 1832 study, for example, we commonly find such statements as "The cost has been decreasing from the commencement, owing to increased skill and improvement of machinery" or "In regard to labor, there has been a gradual decrease in the expenses in consequence of improvements in machinery."[31] The Walker Report (p. 1690) notes an 1834–44 decline of 40 per cent in unit labor cost for the Saco cotton mill, while wages rose 10 to 20 per cent. Declines in unit cost over the 1824–32 period were frequently noted in these early reports. They are also common in the Weeks Report, covering primarily the 1850–80 period. Instead of the closely proportional change that exists between wage rates and upward productivity trends in today's more highly organized labor markets, these early records do not suggest wages gaining in proportion to productivity. Labor costs per yard of print cloth in the Merrimac Mill, for example, fell by 50 per cent from 1850 to 1880 while weavers' rates rose about 20 per cent (Weeks Report, pp. 349–350). In the earlier decades the contrast was even greater: from 1824 to 1860 the weavers' rate remained fixed, as did that for spinners for the same mill. Weavers in an establishment reporting to the Aldrich Committee earned slightly less in January 1860 than the earliest year report, 1843.[32] Yet the likelihood of substantial concomitant gains in productivity is great in the light of trends as reported for other mills in Layer's study (as clearly shown in his Table 15).

[30] *1900 Census*, Vol. VII, Part I, pp. cxiv, cxcv, and 176; and *1890 Census of the United States*, Vol. VI, *Report on Manufacturing Industries in the United States*, Part 1, *Total for States and Industries*, pp. 176–177.

[31] *Documents*, 1833, p. 612, for the New Market Manufacturing Company and p. 820 for Amoskeag Manufacturing.

[32] *Wholesale Prices, Wages and Transportation*, Nelson W. Aldrich, Chairman, 52d Cong., 2d sess., S.R. 1394, March 3, 1893 (hereafter called Aldrich Report), Serial 3074, Part 3, pp. 683–684 and 697–698. Because of the marked January-to-July variation in the Aldrich data, it is necessary to compare data for the same months. July 1842 data were available and show an even greater drop, but were ignored because the July 1860 figures may have been temporarily depressed. Rates for female weavers in establishment 43 (pp. 888–889) for January 1849, the first date shown, and January 1860 were also about the same.

Nineteenth Century Wage Trends

MONEY WAGES

The short-run trends in wages over the nineteenth century reveal the massive impacts of war, the business cycle, and immigration. Table 2 shows these trends in terms of daily wage rates.

TABLE 2

Daily Wage Trends, United States, Selected Years, 1800–1899

				MALES				FEMALES		
		Non-		Manufacturing				Manufacturing		
	Farm	farm	Car-							
Year	Labor[a]	Labor	penter	Cotton	Wool	Shoes	Iron	Cotton	Wool	Shoes
					(dollars)					
1800	10.00	1.00								
1812–15	10.00	1.00	1.50					0.45		
1818	9.30	0.75								
1830–32	8.50	0.75	1.45	1.01	0.93	0.81	1.03	0.38	0.41	0.32
1840	10.40	0.85	1.40				1.00			
1850	10.80	0.90	1.50	0.76	0.83		0.97	0.46	0.49	
1860	13.70	1.04	1.70							
1870	13.90	1.57	3.00							
1880	11.70	1.28	2.23							
1889	13.90	1.39	2.37	1.29	1.47	1.80	1.99	0.92	1.00	1.08
1899	14.60	1.41	2.30	1.19	1.42	1.67	2.03	0.89	0.95	1.03
					(index, 1850 = 100)					
1800	93	111								
1812–15	93	111	100					98		
1818	86	83	100							
1830–32	79	83	96	133	112		106	83	84	
1840	96	94	93				103			
1850	100	100	100	100	100		100	100	100	
1860	127	117	113							
1870	129	178	200							
1880	108	152	149							
1889	129	154	158	170	177		205	200	204	
1899	135	157	153	156	171		209	193	194	

[a] Monthly, including board. Free labor only.

1818–1830

The close of the Napoleonic Wars and the end of the nonimportation agreement is apparent in the farm wage rate data for 1818–30. Between these dates farm wages fell in ten of the twenty-three states for which Senator Holmes shows data.[33] No change was reported in the other

[33] *Congressional Register*, Gales and Seaton, Register of Debates, 22d Cong., 1st sess., January 30, 1832, p. 218.

thirteen. Year-to-year data for nonfarm earnings in Massachusetts pinpoint the transition more precisely:[34]

	Massachusetts	
Year	Nonfarm Labor	Carpenters
	(dollars)	
1811	0.97	1.10
1812	1.07	1.20
1813	1.00	1.21
1816	1.07	1.00
1817	1.00	1.25
1819	0.80	1.14
1820	0.68	1.00

Despite the irregularity of the Massachusetts data they do contrast higher rates in 1812–13 with drastically lower ones by 1819–20. The decline is emphasized by data for turnpike laborers in Pennsylvania, with their wage rate falling from 75 cents in 1818 to $12\frac{1}{2}$ cents in 1819 and only gradually recovering to a 50 cent level by 1821.[35]

1830–1840

After a postwar adjustment, male wages apparently began to rise. The farm wage figures for 1830 and 1840 indicate a rise of nearly 20 per cent for the United States over this decade. But coming as they do from differing sources we can attach no more than a mild probability to this rise.[36] The reliable and comparable data for the Merrimac Mill, probably the largest plant in the United States, show rises for many occupations from 1824 to 1840 (Weeks Report, p. 349).

On the other hand, rates for the sizable group of female workers declined. As the margin required to attract workers from distances to the factory diminished, as the system became more permanently established, the rates fell. For the dominant female group, weavers, rates of about 65 cents a day were paid in 1824 but the rate had fallen sharply to 50 cents by 1840 (Weeks Report, p. 349). A general judgment on the period, although from a *parti pris*, is Webster's disbelief that "labor rose greatly in price after the tariff of 1828. If it kept up to what it had been I incline to think that was all."[37] Layer's data for cotton textiles (p. 46) in fact show virtually the same averages for 1828 and 1840.

[34] Wright, *History of Wages*, pp. 164 and 168.
[35] William A. Sullivan, *The Industrial Worker in Pennsylvania, 1800–1840*, 1955, Pennsylvania Historical Commission, p. 72.
[36] Wright's data are so grossly noncomparable from year to year that one can deduce little more from them for this period than to say that they may be consistent with this generalization.

Beginning with the panic of 1837, however, and ending some time in the mid-1840's a decline in wages occurred. A delegation of New York merchants meeting in April 1837 stated that "within a few weeks not less than twenty thousand individuals, depending on their daily bread, had been discharged by their employers."[38] Such declines were not without their impact on wage rates, but how much or how extended we must judge from scanty data. Layer's figures on monthly textile earnings in New England are one of our sounder sources for this change. While in June of 1837 textile earnings were above the same month in the previous year, by November they were 14 per cent below November 1836.[39] After some recovery a further fall occurred in the spring of 1840. While March earnings were above the previous year, August earnings were 15 per cent below the comparable month in 1839. Monthly price data for prints manufactured by the largest mill in New Hampshire confirm this timing pattern:[40] May 1837, $14.1; November 1837, $11.8; November 1839, $14.4; and May 1840, $11.4.

1840–1850

The trends in the later 1840's are obscure. The contemporary *Daily Commercial* reported that wages in eleven Lowell mills fell from $2.00 a week to $1.75 from 1844 to 1845; on the other hand Layer's data show a rise for four mills.[41] From 1842 to 1846 a contemporary estimate of Abbott Lawrence indicated a 25-cent rise in wages, a much greater rise than Layer's data indicate.[42]

In sum, the sharpest wage cuts occurred in the fall of 1837 and the spring of 1840 with lesser amounts during the early 1840's. Since the textile wage data apply to the industry segment in which the promptest reaction to short-term cyclical influences would be expected, one would anticipate a much smaller response in rates generally paid to laborers and skilled workers. A comparison of textile wages for 1840 with those for 1850 (not necessarily comparable figures since they are from independent sources) suggests that little net change occurred over the decade.[43] Farm wages, too, seem to have changed little, while Massachusetts data for laborers and carpenters report a mild rise.

[37] *Congressional Globe*, March 1840, Appendix, Senate, p. 211.

[38] *Reports of the Secretary of the Treasury*, Vol. vii, September 1837, p. 39.

[39] Computed from data in Layer, p. 18.

[40] *Reports of the Secretary of the Treasury*, Vol. vii, 1849, p. 591.

[41] *Daily Commercial*, quoted in Norman Ware, *The Industrial Worker, 1840–1860*, 1924, p. 8. Layer, p. 18. Wage data for Establishment 39 in the Aldrich Report show a marked 1842–45 decline for weavers, but no change for spinners.

[42] Lawrence is quoted in Ware, p. 30. Data for the Boot Mills, 1843–46, show a rise of intermediate magnitude; *Reports of the Secretary of the Treasury*, Vol. vii, 1849, p. 620.

[43] Layer's data show a rise, but they exaggerate gains over later decades for which we have census data as solid checks.

1850–1860

Beginning with the 1850–60 decade we move on to somewhat solider materials since census occupational wage rate and earnings figures now become available. The U.S. rate for farm laborers rose by roughly one-quarter—concealing, however, substantial geographic differences. While western rates were declining from gold rush levels, and New England rates were rising by a mild 10 per cent or so, rates in each of the southern regions rose by about 40 per cent. This heady rise reflected not merely the opening of the newer regions in the Southwest but the general gains in cotton and sugar prices.

The data for carpenters and laborers show a U.S. gain of 18 to 20 per cent. Considering that the farm laborers' 25 per cent gain includes a varying allowance for the value of board at the two dates, I think we can conclude that all three rates suggest national gains in cash wages of about 20 per cent. Average earnings in cotton textiles rose at a much smaller rate; trivial gains in New England just about offset sharp gains in the North Central regions and the South.

But the figures underlying the New England change show some striking wage cuts during the period. Thus the original census reports by the Merrimac Mill show male average earnings declining between 1850 and 1860 from $1.11 to $0.96, and female earnings from 64 cents to 54 cents (unpublished schedules for Massachusetts). Since the rates shown for individual occupations, particularly for weavers did not decline in this period (Weeks Report, p. 349), a significant change in occupational composition, and a downgrading of skills, must have occurred.

1860–1870

The 1860–70 watershed in our social and political history had, of course, its decisive impact on the course of economic events. Data for the East (from Mitchell's study) and for the South (from Eugene Lerner's recent astute analysis) were adapted for Table 3 to show regional wage differentials during the period 1861–65.[44] By 1863 eastern wages had gained only a trivial 5 per cent. Southern wages had doubled. Over the next year eastern wages rose about 15 per cent while southern wages again doubled. By early 1865 eastern wages had leveled off, while the wildfire spread of southern inflation until the surrender is clearly shown by Lerner's data.[45] After rising like a rocket, southern wages came down like a stick. Western wages in this period appear to

[44] Mitchell, pp. 146–147; data for skilled workers. The unskilled data gained less, but Lerner's data seem to relate more to the skilled factory worker group. Eugene Lerner, "Money, Prices and Wages in the Confederacy, 1861–65," *Journal of Political Economy*, February 1955, p. 32.

[45] The Weeks Report shows some data for the South, but the trivial gains reported have no broader meaning even if accurate for the particular plants covered.

TABLE 3

Index of Regional Wage Trends, 1861–1865

(1861 = 100)

Year and month	EAST (skilled worker)	SOUTH	EAST (machinery)	WEST
1861:				
January	100	100		
July	100	100	100	100
1862:				
January	100	121		
July	102	122	100	107
1863:				
January	105	201		
July	112	263	117	125
1864:				
January	120	397		
July	137	385	139	143
December		521		
1865:				
January	150	784		
March		987		
July	150		162	160

have traced a course broadly similar to eastern wages. Mitchell's estimates for machinery wages to 1863 show western rates rising somewhat faster than eastern, but following a broadly similar course over the next two years.[46]

The net 1860–70 change in wage rates reflects only in part the impact of the war and the social revolution that took place. The net 1860–70 trend for the skilled group of carpenters in the South was substantially the same as in the North despite the ballooning of southern prices, and the upsetting of the traditional slave and cotton economy. Thus the average gain from 1860 to 1870 was about 90 cents in the South Atlantic and $1.12 in the North Central region—a closely similar rise from identical 1860 rates. Furthermore, East South Central and East North Central rates rose by almost identical percentages. Changes in relative supply price were apparently engulfed by the mobility of labor

[46] Mitchell, p. 201. These are Mitchell's averages of Weeks Report data, combining unweighted occupational wage rates. For revealing interregional differences the lack of proper weighting is not so great a problem. The machinery industry was chosen for this comparison because its heavy complement of skilled workers made its wage trends most comparable to those for skilled workers.

in this group. Reconstruction needs enabled skilled workers to command higher rates in the East and West South Central regions than in any northern region, just as they had in 1860.

The data for laborers provides the most spectacular reflection of the war. While northern labor rates had gained 55 to 66 per cent during the war, rates in each of the southern regions gained by about one-third.[47] The trend for farm laborers shows an even bolder contrast: marked gains in every northern region, marked declines in every southern region. The 1860–70 period ends with the South Atlantic states paying the lowest rates in the nation—half those for New England and greater than two-thirds of those paid in the neighboring South Central regions.

REAL WAGE TRENDS

To measure real wage trends in the first half of the nineteenth century is probably impossible. The present task, therefore, is quite simple. During the earlier decades some establishments paid in products—iron, textiles, shoes—which the wage earner then had to dispose of. These, in turn, had frequently to be sold at heavy discount. One woolen manufacturer noted in 1828 that 60 to 70 per cent of his wage bill was paid in scrip redeemable at the company store.[48] Typical was an 1829 Philadelphia carpenter's contract, giving him payment "one half in lumber and one half in cash."[49] In 1841, according to Representative Ramsey of Pennsylvania, wages were paid largely in goods, "making a differential of from 15 to 20 per cent against the laborer."[50] And payment in store orders did not disappear for many years; as late as 1880 a significant proportion of firms in sawmilling, blast furnaces, woolens, and cottons paid part of their wages in store orders (Weeks Report, p. xxii). To measure the wage earners' realized income from such items and deflate by, say, wholesale prices would be a dubious venture—no more realistic than measuring changes in steel prices during the depression by consulting only list price movements. Fortunately for both the wage earner and the estimator this practice appears to have dwindled fairly early in the century. No attempt is made here to reckon with this element other than to warn the reader that it tended to make real wages lower than here estimated.

On the other hand, payment of wages partly in board and lodging was (and continued to be) much more common. Wage rates with board are

[47] The laborers' rate for the South Atlantic in 1870 was $1.21. The $1.06 figure used here excludes Delaware from the traditional census region on the grounds that it is not a southern state by any reasonable set of criteria. Its inclusion elsewhere in the tables makes little difference, but the heavy weight for nonfarm laborers makes for a significant difference here.

[48] *Minutes in Evidence*, Committee on Manufactures, 29th Cong., 1st sess., 1828, p. 79.

[49] William Sullivan, *The Industrial Worker in Pennsylvania, 1800–1840*, 1955.

[50] *Congressional Globe*, Appendix, June 19, 1946, p. 710.

quoted as late as 1870, and then not merely for farm laborers but for all types of skilled mechanics. To deflate this important component is probably feasible but unrewarding. Being income in kind, it may have constituted a fairly stable real wage element. While the wage earner was thus guaranteed against any marked rise in his standard of living he was *pari passu* insulated from any marked decline. In Table 6 (p. 493) an allowance for this consideration, as dubious as it is definite, is made. It is assumed that retail price trends prior to 1860 affected not much more than half the real income of the wage earner, the rest being stable items of income in kind: board, lodging and washing.

For five of the seven periods distinguished in this table, real wages both of nonfarm and farm labor appear to have changed by small amounts, or fallen. From 1830 to 1840, and again in the troubled decade before the Civil War, real wages of each group rose markedly, with very considerable gains for farm labor. We may be inclined to explain the 1850–60 gains by the influence that the discovery of gold in Captain Sutter's race-way and the conquest of Texas had in inducing substantial migration from eastern labor markets. The opportunities afforded by cheap land in the West were present in some degree throughout the century and must have been an element tending toward higher wages over many decades. But a variety of forces operative in many of these decades conspired to dampen the impact on wages of the increases in productivity that we know (from other sources) to have occurred. From 1800 to 1820 the aftermath of the Napoleonic wars with an overwhelming recession and heavy postwar importation of British goods was a major element. In the 1840's it was the heavy immigration from Ireland and Germany. In the Civil War decade it was the precipitous rise in prices.

It is particularly important to note that these separate figures for farm and nonfarm wages do not reflect the trend in an over-all wage index, which must have risen considerably more as the labor force tended to have a greater and greater proportion of nonfarm employees in it. When adequate employment weights have been developed, the combined series will presumably show a greater gain in the real income of American wage earners than do either of these component series. If one treats merely the group of free labor, this is likely. If one encompasses all labor, slave and free, over these many decades, this result is even more certain.

Relationship to Other Estimates in This Volume

How reasonable is the mild gain in real wages suggested by these data? Budd reports that the share of wages in national income rose, and Gallman finds that output per worker in commodity production also rose substantially (see their papers in this volume). A brief look at the

underlying Budd–King and Gallman data, however, suggest that they do not demonstrate any clear inadequacy in the wage data. (This is, of course, not to say that such inadequacy may not exist.)

Budd's estimate of a rising share of wages in national income is, of course, not a single figure but the net product of three estimates: (1) his implicit wage rate series, (2) his implicit employment series, and (3) King's estimates for the other factor shares. Instead of looking at the total result of all these estimates, therefore, let us concentrate on the implicit Budd–King estimate for average wages in the 1850–80 period:

<center>

Percentage Gain, 1850–1880, in average wages

Work	Budd–King	Present
Nonfarm	43	45
Farm	46	8
Total	50	46

</center>

The present estimates actually suggest that average earnings by non-farm employees gained slightly more than the Budd–King estimates imply.[51] For nonfarm earnings, the King data used by Budd rest on sources that King describes with considerable obscurity.[52] Given the remarkable similarity between King's daily wage trend for "men in all industries" (which he bases on the Aldrich Report series) and his final average earnings series, one may surmise his procedures, but no more than that (King, pp. 168 and 198).

The present estimates, therefore, show a smaller gain for all employees than do Budd's figures primarily because they point to a smaller rise for farm wages.[53]

The reader may take his choice of sources here. For farm earnings King gives no information, and Budd's own series was based on extremely limited data (Budd, Appendix B). However, his figures do show much the same percentage changes for 1850–60 and 1870–80 as do the present series. Hence the major difference appears to be his estimate that farm wages rose 46 per cent from 1860 to 1870, compared with the

[51] The Budd–King average wages are computed from the wage data in Budd's Table 1 and his employment series in Appendix A, the two sources being used together in his Table 3. The present farm estimate is from my Table 2, while the nonfarm is a crude average based on the Table 2 indication of a 42 per cent gain for nonfarm laborers, of 49 per cent for carpenters. In combining my farm and nonfarm figures, I used Budd's employment weights and his 1850 average earnings levels to provide direct comparability.

[52] Willford I. King, *The Wealth and Income of the People of the United States*, Macmillan, 1915, p. ix, and the absence of discussion on p. 158.

[53] He estimates an 1850–60 rise of 26 per cent compared to the present 27 per cent and an 1870–80 change of minus 20 per cent compared to a minus 16 per cent. The above discussion relates to Budd's data as originally presented. Revisions for publication now make the movement of average earnings in the present series, 1850–80, and Budd's implicit series much more alike.

present estimate of a 2 per cent rise. The present sources for 1860 were marshals' reports to the census for each state, and for 1870 the Treasury study of wages in these and other occupations in each state. Budd's estimate rests on a judgment made in 1866 by J. R. Dodge, statistician for the Department of Agriculture, of "an increase in the rates of wages in five years amounting to about 50 per cent." Since, says Budd (Appendix B), "the average wage rate fell somewhat between 1866 and 1869, a net increase of 43 per cent in wages in the decade 1860–70 appeared to be a reasonable estimate." Budd's estimated change is quite similar to that estimated in the present series for the trend in the northern states. However, a significant decline occurred in southern and in western wages, one reflecting the huge influx of slave labor into the free labor market, and the other, the opening of the West. If we weight these regional series together by the population census counts by occupation, the trend is the decline indicated by the present estimates.

Gallman's data offer another check point and his figures on value added per worker in agriculture and in manufacturing and mining are shown below:[54]

Percentage Change, 1850–1880

Work	Average Wages per Employee (present estimate)	Value Added per Gainful Worker (Gallman)
Nonfarm	46	24 (manufacturing and mining)
Farm	8	50

For the nonfarm area the Gallman data hardly imply any understatement in the present measure of wage trends, since wages constitute a major component of value added. For farming they are really irrelevant: since farm operators constitute 85 per cent of the gainful worker total used by Gallman, a rising trend per person in the entire group tells us nothing definite about the returns to the hired labor component.

In addition to taking Gallman's figures as a measure of costs, we might use his deflated value added series as a measure of final product trends and see how the per capita figures behaved. But these are even less relevant. For the changing proportions of self-employed to all gainful workers, of slaves to free workers, and of children to adults in the population would all conspire to change the per capita figures even if there were no change in the returns to labor.

A further element to be noted in the real wage estimate is the import-ance of the choice of deflator, and the different results that derive from using Wesley Mitchell's index rather than that of Ethel Hoover (in this

[54] Data on value added per worker in 1879 prices, appearing in his Table 12, have been put into current prices by using his deflators from Table A–21.

volume). A final choice cannot properly be made until fuller use has been made of her series, but several points may be noted now. First, she has made a substantial improvement in using a set of weights developed to represent the entire range of consumer expenditures in true proportion, rather than, as Mitchell, letting the distribution of items explicitly covered reflect by implication those not covered. A second point is the result of an arduous project in which she utilized many more price series in developing her final series than did Mitchell—a considerable improvement in principle. The general effect of her adjustments is to make a significantly smaller gain in prices, hence a greater gain in real wages, over the 1860–80 period. This can be broken down as follows.

For 1860–65 and for 1868–80 the net changes shown by her series and Mitchell's differ little, suggesting that the weight change made little empirical difference. The major difference for 1865–68 reflects largely her more comprehensive use of Weeks's price series for "June 1" or unspecified dates. Mitchell did not use such series, selecting only those reported as annual averages. The latter seem more stable and representative of year-to-year trends. To choose one example: from 1860 to 1861 Mitchell's index rises more, one element being a greater rise in the price of "veal forequarters." For Connecticut, Mitchell uses one report showing a rise of a third, ignoring a June report of a decline of nearly 30 per cent. For New Jersey, the annual average stays unchanged 1860–61, while two June reports for New York actually show declines. A priori, price rises seem more likely for the 1860–61 change than do such marked declines. For 1879–80, two yearly averages reported for Connecticut show potato prices unchanged or rising slightly, while two June prices show declines of 25 and 29 per cent, and June prices for New York show marked declines. (Data from Weeks Report, pp. 44ff.)

Detailed Estimates

AGRICULTURE

To indicate the major wage trends in agriculture, estimates were prepared of the trend in average monthly earnings of laborers hired by the season, with board included in their remuneration. Such estimates were made for the several states on the basis of tolerably reliable figures for 1818, 1830, and decennial figures 1850–1900.

1800–1818

For 1800–18 an estimate was made primarily on the basis of Carey's assertion that agricultural wages in Pennsylvania showed little net change over the 1800–35 period, an assertion confirmed by the stability

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of earnings rates for other groups.[55] Since Representative Troup estimated in 1812 that agricultural wages then ran to $10 a month, and the Holmes data (discussed below) also averaged about $10 in 1818, the 1800 figure was likewise estimated at $10.[56]

1818–1830

For 1818, 1826, and 1830, estimates were given by Senator John Holmes of Maine.[57] These data provide a distribution both among the states and through time. One element in favor of their general reasonableness is the fact that Holmes made his 1830 estimate no more than a year after the fact, and his figures seem to have been subject to no criticism in the midst of generally warm debate. Generally confirmatory are estimates that many manufacturers made in 1832 about prevailing local wages in their area (*Documents*, 1833, passim). The number of respondents was particularly great in New Hampshire, Massachusetts, and Vermont. For these states the data indicate median rates of $10, which is in line with Holmes's estimates for other New England states but above his $8.50 figuré for Massachusetts.

We have only a crude basis for assessing Holmes's figures for the states outside New England. For 1818 we can refer to contract prices paid by the army for various items at different posts in the North and South Atlantic states.[58] Using the prices paid per barrel of flour (a substantial item, and one likely to have been provided locally with a minimum of transport differentials involved), one can deduce the general reasonableness of the relationships among these various state rates of Holmes, except that the averages for Pennsylvania and Maryland appear to be too high. Data on procurement prices of rations for entire areas (e.g. "Pennsylvania East of the Alleghenies and West of the Susquehanna," "Kentucky," etc.) are available as of 1814.[59] These, too, suggest that estimated Maryland and Pennsylvania rates were too high. This indirect inference might well be rejected for Pennsylvania if most farm laborers were hired in the border areas, where rates would be higher. For Maryland, the problem is more difficult. Baltimore flour prices were only about 10 per cent above Norfolk's in 1818, and Maryland rations slightly above those for Virginia in 1814. Yet Holmes's Maryland wage rate is far above that for Virginia. No adjustment was made, however, because substantial labor demand in Baltimore and the

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[55] H. C. Carey, *Essay on the Rate of Wages*, Carey, Lea, and Blanchard, 1835, p. 26.

[56] Troup's estimate is in *Annals of Congress*, November 1812, col. 182. Carey's own estimate of $9 related to Pennsylvania alone.

[57] *Congressional Register*, Gales and Seaton, Register of Debates, 22d Cong., 1st sess., January 30, 1832, p. 218. Holmes states that "the valuation . . . is the price per month taking all seasons of the year inclusive of board and exclusive of clothing."

[58] *American State Papers, Military Affairs*, Vol. I, pp. 348–350.

[59] *Letter from the Secretary of War transmitting statements of contracts made by the War Department during the year 1814*, Roger Chew Weightman, February 9, 1815.

District of Columbia and the absence of slave competition would imply some excess of Maryland over Virginia rates. Moreover, it seems unwise to reduce the 1818 figure below that prevailing in 1830, a period much closer to Holmes's then current knowledge, when to do so would wipe out the 1818–30 decline that Holmes presumably sought to report.

1840

For 1840 the estimate by Ezra Seaman of $3.60 a week for the 1840–50 period is used, making $10.40 a month.[60] The resultant 20 per cent gain from 1830 to 1840 implied in this estimate is virtually identical with a series for rates in New York (Cortland County), and in Vermont.[61]

A variety of estimates for 1845 were secured by the Commissioner of Patents, scattered data appear in a compendium of the Bureau of Labor, and a few reports are referred to in the Industrial Commission Hearings of 1900.[62] These figures are spotty, retrospective, and not particularly evaluated in relationship to one another, so that no direct use could be made of them.

1850–1860

For 1850 and 1860 special wage rate inquiries made in connection with census reports on social statistics give monthly rates paid to farm hands (with board), and are used here.[63]

1870

For 1870 we have early reports made by crop reporters to the Department of Agriculture (G. K. Holmes, p. 30). Unfortunately, this set of statistics marks a largely different measure. The earlier series tend to reflect informed judgments as to the general average—judgments by Senator Holmes, by individual manufacturers, by the marshals (or possibly assistant marshals) for each state. They attempt to reflect the state average. With the crop reporter figures we have a markedly different measure—that of particular crop reporters who were in the Agriculture sample *and* were willing to report, many of whom would tend to report not on the general average but the rates they themselves

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[60] Ezra Seaman, *Essays on the Progress of Nations,* Baker and Scribner, 3rd ed., 1868, p. 305.

[61] T. M. Adams, *Prices Paid by Vermont Farmers, for Goods and Services and Received by Them for Farm Products, 1790–1940: Wages of Vermont Farm Labor, 1780–1940,* Statistical Supplement, Vermont Agricultural Experiment Station, Bull. 507, February 1944, Table 30; and 62d Cong., 1st sess., 1911, S. Doc. 72, Part 3, p. 1787.

[62] For the Commissioner of Patents and other data, see George K. Holmes, *Wages of Farm Labor,* Dept. of Agriculture, Bureau of Statistics, Bull. 99, 1912, pp. 20–21 and 7–20. For the Industrial Commission, see *Hearings,* Industrial Commission, Vol. XI, 1900, p. 126. For the Bureau of Labor, see *History of Wages in the United States from Colonial Times to 1928,* Bureau of Labor Statistics, Bull. 604, 1934, p. 225, hereafter referred to as BLS Bull. 604.

[63] DeBow, p. 164; and *1860 Census of the United States, Statistics of the United States,* p. 512.

paid. Recent data indicate clearly that the crop reporter is not himself a representative farmer with respect to many characteristics, and one of these is apparently the wage level he pays.[64] This problem may have been particularly acute during the early years of the reporting system. In any event, the Agriculture figures for 1869 were subjected to special examination. A decision was then reached to utilize data from an entirely different source, one giving estimates similar in character to those for 1850 and 1860. This decision was taken largely because (1) they lead to more reasonable estimates of the 1860–70 change; (2) they were reported in the context of wage rates for half a dozen nonfarm occupations so that the comparative interrelationship could be subjected to contemporary examination; and (3) the Agriculture figures for some states appeared not to be averages for year-round hiring but winter-season averages, possibly reflecting the fact that the first Agriculture reports were made as of December. (As one example, the Department of Agriculture showed Arkansas earnings at a rate 25 per cent higher than those for Texas. The 1850 and 1860 census figures and the Agriculture rates beginning with 1874, however, show them to be much the same.)

The source used for 1870 was a study made by Edward Young, Chief of the Bureau of Statistics of the Treasury Department (the Young Report), in which figures on wage rates in a host of occupations were collected. Because of the timing, it seems possible that the data for agriculture were collected in connection with the 1870 census (though even if this were so it would not particularly warrant the estimates).[65] The data may have been developed, as other materials in the volume were, from information secured by the assistant assessors of Internal Revenue in the various states or from other sources. Their issuance, however, under the sponsorship of a competent statistician who was experienced in data evaluation and presentation and who had worked under David A. Wells, entitles them to preliminary consideration.

In any event, the Young data seem reasonably satisfactory except for Mississippi. An estimate for that state was made on the study of a special report by the Commissioner of Agriculture for 1867, the Department of Agriculture estimates, and the Young figures.[66]

[64] For data on the coefficient of variability for the wage rate data in the several crop reporting districts and state, running about 20 per cent as of October 1, 1939, see R. F. Hale and R. L. Gastineau, *Reliability and Adequacy of Farm Wage Rate Data*, Dept. of Agriculture, February 1940.

[65] Young Report, pp. 202ff. The 1870 census data were collected but not published because of their inadequacy (cf. *1870 Census of the United States*, Vol. 1, *Population*, pp. xxxviii and xliii). Since Young's data were obviously a compilation, and since the basic table including farm wage rates reports the occupations and modes of payment covered in the 1850 and 1860 census enumerations of wages, this surmise is offered.

[66] The Commissioner's data are quoted by G. K. Holmes (p. 22). For Mississippi, a slight excess in rates above those for Alabama appears in the 1818–50 estimates shown

1880-1900

For 1880–90 the crop reporter surveys of the Department of Agriculture were used.[67] For 1900 these surveys do not give data for men hired by the year—as do the reports used here for earlier periods—but for hiring "by the year or season." Such figures appear to be at a markedly higher level, but further analysis indicates they in fact can be used, being of adequate comparability.[68] For 1910–48 the official estimates of the Department of Agriculture for this period were used—estimates not wholly comparable with data since the latter date.[69]

The state data were combined into regional and U.S. averages, using weights from the population census. For 1818–30, the total reported by the 1820 census as having agricultural occupations, minus the number of male slaves fourteen years and over, was used.[70] The latter group was excluded after examination of the individual state reports showed that for nearly every state the total gainfully occupied equaled the number of white and free colored males sixteen and over plus the number of male slaves fourteen and over. It was therefore assumed that all male slaves fourteen and over were included as gainfully occupied in "agriculture." (Though a small group were undoubtedly engaged in other pursuits, their inclusion would hardly distort the average earnings figure.)

For 1850, the number of free white male farmers fifteen and over was used for weighting, and for 1860, the number of farm laborers.[71] The ratio of farmers to farm laborers in 1860 indicated a marked degree of intrastate uniformity so that the shift from one type of weights to the other would not make a marked difference.[72]

For 1870 and 1880 the census counts of agricultural laborers aged sixteen to fifty-nine were used for weights.[73] For 1890 and 1899 the census count of male agricultural laborers age sixteen and over in 1900 was used.[74]

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above, and in the Agriculture figures from 1866 on. The Commissioner's data show a great excess in 1860, markedly reduced by 1868. I have, therefore, assumed the same excess in 1870 as shown by the Department of Agriculture in 1869.

[67] G. K. Holmes (p. 30) using reports for 1880–81 and 1889–90.

[68] G. K. Holmes gives rates for 1909 by the year (p. 30), for 1899 and 1909 by the year or season and it is these that suggest gross noncomparability. However, study of state by state trends in monthly and daily rates suggests these estimates (made by Holmes) are misleading and themselves noncomparable.

[69] Annual average figures kindly provided by Robert Masucci.

[70] *1820 Census of the United States*, first table.

[71] *The Seventh Census of the United States: 1850*, 1853, p. lxx; *1860 Census, Population*, pp. 662–663.

[72] Using the 1860 regional count of farm laborers to weight the 1850 rates, thus exaggerating the noncomparability, changed the 1850 average from $10.85 to $11.75.

[73] Data for 1870 from the individual state tables, *1870 Census*, Vol. I, *Population*, pp. 719ff. *1880 Census of the United States*, Vol. I, *Population*, p. 724.

[74] State tables, *1900 Census, Occupations*, pp. 220ff. For 1890 it is not possible to

Series for a few individual states agree in indicating breaks in wage rates at the end of the war of 1812–14 and the recession of 1837–39, general steadiness through the "hungry forties," the rise through the fifties and, of course, during the Civil War.

COTTON TEXTILES

Perhaps our earliest substantial manufacturing industry was cotton textiles. For this reason one can more readily put together systematic surmises as to the course of earnings in this industry than for many others (Table 4).

TABLE 4

Cotton Textile Employees, Average Daily Earnings, Selected Years, 1816–1900

(dollars)

	BOTH SEXES	FEMALES		
Year	United States	United States	Massachusetts	Lowell
1816	0.50	0.45		
1824				0.45
1828				0.44
1832	0.54	0.40	0.44	0.48
1835				0.53
1840	0.49			
1842				0.50
1846				0.54
1850	0.55	0.46	0.50	0.60
1860	0.63			0.52
1870	0.92		1.19	
1880	0.79			
1890	1.00			
1900	0.92	0.85	1.00	

An early nineteenth century estimate is one made in February 1816 by Representative Newton of the Committee on Manufactures.[75] Newton estimated that earnings in cotton manufacturing ran to $150 a year. Because this estimate was contemporary, and because it was

exclude unpaid family workers per se nor the ten to fifteen age group as an approximation. Since this is more a sizable factor in distorting weights than the use of cleaner data for 1900, the latter figures were used for both dates.

[75] *Annals of Congress*, 1816–17, February 1816, col. 962.

made in the context of active Congressional debate on the wisdom of the proposed tariff of 1816 and hence subject to challenge with respect to its implications (northern versus southern wages, income, welfare), it deserves consideration as an initial indication of wage levels. One can estimate from this average an implied rate of 45 cents for females.[76]

The rate appears to have stayed much the same over the following decade. For 1824 we have a figure of 45 cents a day in the Waltham mill, and for 1828 a figure of 44 cents a day for two "of the best known Lowell mills."[77]

In 1832 a massive debate on tariff revision was under way. One aspect of political debate, as in later years, was the collection of statistics. A broad collection of reports was made by a Convention of Friends of the Manufacturing Interest, held in New York in 1831.[78] Its estimates were widely quoted in Congress and eventually appeared in the 1860 census volume and (without attribution) in the 1880 census.[79]

The data offered by the Convention lead to an estimate of 60 cents a day for all employees. This figure is too high, judging from direct reports for hundreds of individual establishments collected for the Secretary of the Treasury in 1832.[80] For the estimates in the present study the reports in this source for all cotton manufacturing establishments outside Massachusetts employing more than twenty-five males were combined with them. This procedure means that well over 90 per cent of all cotton textile employment was included, the exclusion of the smaller Massachusetts mills producing an overestimate of the daily rate by no more than one or two cents. The coverage of these reports, however, was less complete in New Jersey and Pennsylvania than those of the Convention, and hence the averages from the latter source were

[76] Assuming that Newton was making a reasonably arbitrary estimate, one can infer that he began with 50 cents a day, multiplied by the 311 work days common at this period, and rounded the annual resultant $156 to an even $150. Taking the number of adult males employed in the industry (estimated by Newton as 10,000) and assuming their annual wage to have been $1.00 a day, the rate estimated above for common labor, one deduces a rate of about 45 cents a day for the women and children. Newton estimates that 90,000 of the 100,000 employees were women and children. (The proportion of males in 1832— for which we have reliable data—is actually closer to 50 per cent than this 10 per cent.)

[77] The 1824 figure was derived from the Waltham payroll data by Edith Abbott ("The Wages of Unskilled Labor in the United States, 1850–1900," *Journal of Political Economy*, June 1905) and is quoted in BLS Bull. 604, p. 91. The 1828 data are also for payroll records reviewed by Carroll Wright, *Wright Report*, folio p. 576.

[78] *Niles Register*, Vol. xlii, March–August 1832, Addendum, p. 7.

[79] *Register of Debates*, 1833, col. 1327; and Carey, p. 69. Carey quotes figures on employment and total wages. The employment data are virtually identical with those reprinted in the Wright Report. The payroll aggregates were not printed in the 1830 census. Higher payroll aggregates were quoted by Representative Burges in the *Register of Debates* (January 26, 1833, col. 1372), and are printed in the *1860 Census of the United States, Manufactures* (p. xix), both sources attributing them to data prepared by the New York Convention.

[80] *Documents on Manufactures*, 1832, Washington, Duff, Green, 2 vols.

used.[81] For New York males the Convention report was also used, primarily because the somewhat broader range of replies in the Treasury report does not clearly separate the adult male rates from those for boys, as the Convention reports clearly do.[82] The resultant state by state figures form the basis for the data in Table 2.

Since the 1816, 1824, and 1828 rates of 45 cents apply to the larger mills in New England, however, the figures most comparable with them for measuring 1816–32 trends is the average of about 48 cents paid to females by the Lowell Mills in 1832.[83]

From the period circa 1835 Carey reports the Lawrence Mill's payroll, with an implied 53 cent average for females in this important Lowell Mill, or roughly the same level that prevailed in 1832 for Lowell Mills other than Merrimac.[84]

For 1840 an estimate was made on the basis of a cost analysis, starting from census data on value of output and number of employees. The first step was to estimate the pounds of cotton consumed in manufacturing by interpolating between the 1831 and 1850 census figures on such consumption by the movement of cotton disappearance less exports.[85]

The ratio of pounds consumed to disappearance was 0.60 in 1831, and 0.50 in 1850, 1860, and 1870. It was assumed to be 0.60 in 1840 as in

[81] The Treasury reports included no data for Philadelphia or its environs, only a few from Bergen County, N.J. Textual comment indicates difficulty in getting reports since just a few months previously they had been supplied to the New York Convention. The Maine rate seems excessively high since iron foundries and other mills paid only $1.00 a day. Its level reflects the $1.25 reported for the Saco Mill, whose size far overshadows the $1.00 reported for the Cumberland Mill and other employers.

[82] Reports submitted by agents for all states but New York make such distinction adequately. The average for all males in New York computed from the reports comes to $0.87 a day. The average for adult males computed for all reports where rates for boys were separately shown was $1.19. There is an obvious bias in such a selection, for adults were used in some plants for jobs specifically allocated to boys of the latter group. The Convention average of $1.00 was therefore adopted for adult males. For females and boys the two sets of data give precisely the same averages.

[83] The Hamilton and Appleton Mills report 50 cents and 52 cents respectively in 1832 according to *Documents*, 1833, Vol. I, while the Merrimac Mill reported only 44 cents. As the Merrimac rates were above those for the other mills in 1850, 1860, and other dates, this is particularly puzzling. Weighting the Merrimac and other Lowell rates by employment gives an average of 48 cents.

An additional reason for questioning the 44 cent rate is that a 67 cent scale for Merrimac weavers in 1824 was reported by the company in the Weeks Report (p. 349). A decline from 67 cents in 1824 to 44 cents in 1832 is not at all consistent with qualitative evidence on labor reactions such as is outlined in Ware's study or other reports. Possibly the figure excludes board while the others include it.

[84] Carey quotes his figure as applying to the earnings of 4,800 females in the Lawrence factory but does not specify the date. I have assumed it to be roughly contemporary with the date of publication.

[85] Data on pounds of cotton consumed in 1831 and 1850 appear in the Wright Report (folio p. 545). Data on disappearance were kindly provided by Robert Masucci of the Department of Agriculture. Exports were crudely estimated from figures on crude materials exports.

1831, the earlier decades presumably being more alike in the proportion of all cotton consumed in home manufactures, and hence in the ratio of factory consumption to total. The pounds of cotton consumed were then multiplied by average price data to estimate the value of cotton consumed in manufacturing in 1831, 1840, and 1850. (Price data from Robert Masucci as above.)

The cotton cost series was then used to interpolate between 1830 and 1850 census data on materials cost. The materials cost series, 1830-60, was then deducted from that for total output to give a series whose movement was overwhelmingly dominated by the payroll changes. Actual payrolls both in 1832 and in 1850 were 60 per cent of this series, and were assumed to be 60 per cent in 1840 as well. Dividing the result-ant payroll total by the census count of employees gives an annual rate of $152 or a daily rate of 49 cents for both sexes, compared to a U.S. average of 54 cents computed from the 1832 materials discussed above.[86] Under the impact of the depression of 1837, therefore, wages in cotton textiles appear to have fallen 10 per cent between 1832 and 1840.

For 1842 and 1846 we have Abbott Lawrence's figures of 50 cent and 54 cent averages respectively for females in the Lowell Mills as a group (quoted in Ware, p. 30). His earlier estimate is confirmed by the 48 cent an hour average for females in the weaving departments of a large number of Lowell Mills in 1842-43, according to payroll documents gathered by Edward Atkinson.[87] The *Daily Commercial* estimated cash wages for females in all Lowell Mills falling from $2.00 a week in 1844 to $1.75 a week in 1845 while other contemporary sources show a 1845-46 rise.[88] These data are inconsistent with trends shown by Layer's study for selected mills. No inference can therefore be drawn other than that of a marked fall during certain years in the forties, more or less counteracted by the end of the decade.

For 1850 we have average monthly wages as reported in the census, and these divided by twenty-six give a daily average.[89]

[86] The work year is here taken as 311 days. Layer's thesis (Appendix G) shows 309.75 days worked in the Hamilton Mill, 310.75 in Nashua, 302.00 in Lawrence, and 310.75 in the Boston mill. No general unemployment is indicated; hence, the standard 311 days referred to in the discussions of the time was used in converting from an annual to a daily rate.

[87] Quoted in the Wright Report. Wright also quotes (p. 577) a mass of individual rates for each sex for individual departments (dressing, weaving, spinning, etc.) working on different yarn counts. There is no basis for combining these figures to give their proper weight to each.

[88] The *Commercial* is quoted by Ware (p. 8). *Hunt's Magazine* figures, et al., are quoted by Ezra Seaman (*Supplement I to Essays on the Progress of Nations*, 1847, p. 77.)

[89] DeBow, pp. 180-182. The point may be raised as to whether, say, twenty-five days or twenty-four days might not be the proper divisor. The figure of twenty-six is the one commonly used in discussion of the time, and no pattern of severe unemployment appears to have existed to justify a lower estimate.

For 1889 we have average weekly earnings as reported by the census and these, divided by six, were used to give daily averages.[90]

For 1899 an estimate was made by extrapolating the 1889 daily average by the trend shown in census annual earnings figures 1889–99 for these industries.[91] This procedure implicitly assumes that the conversion from the census annual to daily averages (the proportion of a full year actually worked) was the same in both years. The reasonableness of this assumption is indicated by comparing the weeks worked information in the 1890 census with those of the 1905 census, and the over-all estimates of Paul Brissenden.[92] The possible error would not change earnings by more than a few cents.

The Bureau of Labor Statistics figures for earnings in these early years were not used since they are based on an extremely small and probably biased sample of firms.[93] In addition the sample of occupations selected is biased. As a result the averages to be derived from these reports are too high, according to Witt Bowden, and that is precisely what a comparison between Douglas's summary figures and the present estimates indicate.[94]

The reader will note the marked decline for male earnings in cotton textiles, which helps increase the 1889 spread between this average and that for unskilled males generally. This occurs not so much as a result of the trend within given plants, such as would be reported by a constant sample of reporting firms, but because of a shift of the industry to the South. Average earnings of males outside the Carolinas fell by a mere 2 per cent, but the national average fell by nearly 8 per cent, reflecting primarily this shift to lower paid areas.[95] Hence, the trends shown for individual occupations, as reported in the Bureau of Labor Statistics

[90] *1890 Census*, Vol. VI, Part 1, p. 669 and Part 3, p. 206–207, 139, and 417. I am indebted to Albert Rees for pointing out the error in the first draft of this paper of using annual averages for 1889 and 1899 and dividing by a 311 day work year. This produced an underestimate of the true daily figures by 5 per cent to 12 per cent depending on the industry.

[91] Annual data in *1900 Census*, Vol. VII, Part 1, pp. 6 and 176.

[92] *1890 Census*, Vol. VI, *Manufacturing*, Part 3, pp. 139, 207, and 417; *1905 Census of Manufactures*, Part 1, pp. 545, 549, and 547. Paul Brissenden, *Earnings of Factory Workers, 1899 to 1927*, 1929, p. 337. None of these data are precisely relevant. Taken as a whole they suggest that if we varied the implicit assumptions of 289 to 294 days, depending on the industry, the range of reasonable adjustment could change the estimates in Table 2 by no more than a few cents.

[93] Douglas (p. 74) records the 1903 coverage level. Comparison of these with the 1905 census (Part 1, pp. 4, 7, 11, and 20) indicates a 1 per cent sample in iron and boots and shoes, and about 2 per cent for cotton and for wool.

[94] Douglas, p. 124; Witt Bowden, "Nongovernmental Historical Series on Earnings, Wages and Hours," *Monthly Labor Review*, August 1955.

[95] This, of course, bears on a point raised by Albert Rees in his commentary. The 1900 census (Vol. VII, Part I, p. cxviiff.) shows a decline in cotton wages, and (p. cxcv) the great increase in cotton specialization of the Carolinas. State data are from this source (p. 176). The census population data on occupations (*1890 Census, Population*, Part II, passim, and *1900 Census, Occupations*, Table 33) confirm the great rise from 1890 to 1900, and shift.

studies and as summarized in Douglas's estimates of hourly earnings, do not reflect this change.[96]

In the preparation of the above estimates it will be noted that little use has been made of the data in earlier studies. The inadequacy of the Aldrich Report estimates for the 1860–80 period is described below in the section on 1860–80 estimates, and a fortiori their adequacy for earlier years is even less. The limitations of the Mitchell revisions are noted in the same section. The Weeks data and those quoted in the Wright Report suffer from being unweighted occupational averages.

Robert G. Layer's fundamental study rests on a really solid foundation of the actual payroll records for four very important New England mills. While undoubtedly invaluable for showing year-to-year trends, his estimates are unsatisfactory for showing the longer-run changes.

1. He makes no attempt to tie his figures to the comprehensive census bench marks for the industry. As a result, for example, his data show an 1850–60 decline in wages (pp. 46–47) while the census figures rise by 15 per cent. His 1832–50 data report an 11 per cent rise while the present estimate of a 2 per cent rise is based on the comprehensive 1832 figures and the 1850 census.

2. His averages are based on labor costs in four departments of each mill surveyed.[97] In excluding other labor costs of bleaching, and so forth, for "comparability," he produces some puzzling findings. Thus the original census report for one company (the Hamilton Mills, as of 1850), shows $297,000 paid in wages whereas Layer reports a labor cost of only $180,000; and while the census shows a decline in wages paid by this mill over the next decade, Layer reports a rise.[98] The result, of course, is to make the ratios of cotton cost to labor cost strikingly different from those reported by the company to the census. Since such tests would normally be useful in validating the wage data based on such labor cost totals, they make one hesitant about using these wage data. In addition, there are a number of minor, but puzzling problems.[99] The Layer data were therefore useful primarily as a check on the census and other reports.

[96] Data in BLS Bull. 604 for key occupations show a mixture of stability and declines. Weighting these by the changing employment in each region would bring about similar results to those indicated above, not to what the BLS data appear to reveal when first considered.

[97] Robert G. Layer, "Wages, Earnings and Output in Four Cotton Textile Companies in New England, 1825–1860," unpublished thesis, Harvard University, 1952, pp. 22 and 26.

[98] Since Layer clearly intended to exclude only a small group of workers, such as cloth room workers and overhead personnel, the size of this gap is hard to understand (*ibid.*, pp. 253 and 256).

[99] Thus Layer (*Earnings of Cotton Mill Operatives*, p. 21) shows a decline in earnings from one period in 1825 to another, but his individual plant data on page 22 show that a link relative calculation should give a rise. His November 1827–May 1828 data for two individual companies show a gain of 0.047 cents for one company, while the other rises 0.035 cents over only part of the period; his combined index, however, rises only 0.013 cents.

NONFARM LABOR

1800–1818

For common labor a range of 75 cents to $1.00 seems to have prevailed over this period, with some indications of $1.00 being the common rate for the early decades, while the lower figure appears more frequently after the War of 1812 when the flood of British imports affected competition and wages. For the 1800–1805 period we have a statement by Representative Morris in 1802 to the effect that labor then commanded $1.00 a day.[100] Another contemporary statement is that of Samuel Blodget, in 1801, who also found common labor averaging $1.00 a day.[101] In later years, Blodget reduced his figure somewhat.[102] There is no basis for knowing whether his later figure is more accurate. McMaster indicates a range over the 1800–10 decade of $1.00 to $1.33 for factory and heavy construction labor.[103] Factory work, of course, would normally have commanded a premium over common labor.

As against a level of about $1.00 in 1800, we have a figure of about 75 cents circa 1818, after the immediate impact of the war's end had occurred.

Records secured by the Massachusetts Bureau of Labor Statistics for the 1818–25 period center around a 75 cent figure.[104] And a writer in 1818, somewhat out of place in a study of "the pleasure of contemplation," feelingly observed: "If a poor man gets, by muscular labour, 60 pounds . . . annually, he has reason in the present state of social law and custom to bless God."[105] With the exchange rate at just over $4.00 and 311 working days a year this comes to just over 85 cents a day.[106]

As a less direct indication we may take an estimate of 50 cents a day for average earnings by 100,000 employees in cotton textiles in 1816 according to an estimate made in that year by the Committee on Manufactures (see the section on cotton textiles). This figure would

[100] *Annals of Congress*, March 1802, p. 226.

[101] Samuel Blodget, *Thoughts on the Increasing Wealth and National Economy of the United States of America*, 1801.

[102] He gives 90 cents in his *Economica* (cf. BLS Bull. 604, p. 21).

[103] Quoted in *ibid.*, p. 138.

[104] Wright Report, p. 168. Wright shows a $1.00 level for 1817, with "medium" rates of 75.3 cents in 1818, 79.5, 67.6, and 70 cents through 1821. Averaging his high and low rates for the same years, and for 1821–25, also gives figures around 75 cents. Because weighted averages are unavailable and the sampling errors are unknown, it seemed safest to use these data only for suggesting (1) a central tendency around 75 cents, and (2) a marked decline after the war.

[105] C. C. Blatchly, "Some Causes of Popular Poverty," in Thomas Branagan, *The Pleasures of Contemplation*, Philadelphia, 1818, p. 183.

[106] The exchange rate of $4.35 in silver, $4.57 in gold is given in John Adams's *Report on Weights and Measures*, U.S. Cong., Serial Set 55, no. 109. The number of working days is the figure given repeatedly for individual establishments in 1832 in *Documents*, 1833.

imply something like $1.00 for males in textiles.[107] That occupation in general running 20 to 30 cents above the rate for common labor, we have a very weak confirmation of a 70 to 80 cent rate for labor in 1818. Given such tentative estimates of $1.00 for 1800 and say 75 cents for 1818, we are in a somewhat better position to judge the $1.00 estimate for 1812 appearing in the Massachusetts report and, I believe, find it not unreasonable (Wright, *History of Wages*, p. 167).

1830

For 1830 an estimate of 75 cents seems the most likely figure. A 75 cent rate is given generally by individual manufacturers in the 1832 reports on the prevailing wages in their area.[108] And "medium" rates for laborers in Massachusetts average 74 cents (Wright, *History of Wages*, p. 167).

Representative Ramsey of Pennsylvania gives figures for earnings of laborers in coal mines of 82 cents in 1831 and 80 cents in 1840.[109] Carey gives a weekly wage of $5 (or 83 cents per day) as the average for "productive labourers," presumably applying to the eastern areas where they were primarily located.[110]

Payroll records for Pennsylvania turnpikes in this period average 50 cents, for canals 62 to 75 cents, and 80 cents.[111] The range of these payroll sources is therefore about 62 to 83 cents, with a midpoint of 72 cents.

1840

Laborers' earnings in 1840 appear to have run about 85 cents a day, an estimate arrived at by extrapolating a reliable 1850 figure by an index of 1840-50 change and confirming the result by certain direct estimates for 1840.

Scattered data for 1840 from the Aldrich Report were combined by Edith Abbott into an average of $1.00, and from the Weeks Report, into one of 88 cents. Reference to the original sources, however,

[107] The daily average for cotton textiles in 1832 (discussed above) was 41 cents for females and 81 cents for males.

[108] *Documents*, 1832. Typically, these reports specify common labor at 75 cents, not distinguishing farm from nonfarm labor except that the former tends to be quoted at $10 to $12 a month (with board) while a daily rate of 75 cents tends to be associated with nonfarm labor.

[109] *Congressional Globe*, Appendix, June 19, 1846, p. 710.

[110] Publicola, *Thirteen essays on the policy of manufactures in this country, from the New York Morning Herald*, Philadelphia, Clark and Roser, January 29, 1830, p. 13. Carey speaks of a decline in wages of $2 a week if the tariff is ended, and asks whether "our labourers" will then "be content to earn no more than three dollars per week? Our mechanics only four."

[111] William A. Sullivan, *The Industrial Worker in Pennsylvania, 1800-1840*, 1955, pp. 52, 72, 152, and 155.

indicate only six series in the Weeks Report (pp. 545, 550, 554, and 559) and only three in the Aldrich Report (establishments number 40, 47, and 85) reaching back to 1840. The alternative Abbott averages were therefore ignored. Instead the original data for 1840 in both studies were pooled and combined with some equally limited observations in a report of the Commissioner of Labor Statistics.[112] A similar computation was then made for 1850, giving an estimate of the 1840–50 change. Such a ratio estimate will have a somewhat higher order of reliability than a direct point estimate of level for 1840, and this is an important consideration where high sampling variability is likely to be present. The resultant estimate of 85 cents for the United States (and say 87 cents for the Middle Atlantic) is in line with *ad hoc* estimates for 1840. Thus laborers in the Brooklyn Navy Yard received 95 cents in 1836 and $1.15 in 1840, a rate likely to have been somewhat above those paid by private employers.[113] A Philadelphia pamphleteer in 1840 believed that the average immigrant to the United States hoped to make a $1.00 a day.[114] Senator Davis assumed that wages ran to $1.00 a day at the beginning of 1840, not specifying the skill level to which he referred, however.[115] On the other hand, Representative Norris estimated $1.00 a day in 1840 for hands in iron mining.[116] Given the customary excess of factory labor over common labor this figure would be consistent with a rate of 85 cents for the latter.

1850 and 1860

For 1850, average wage data were reported by the census marshals, the results having been placed in the census volume between the figures on pauperism and those on crime, a tour de force of commentary in a generally staid volume (DeBow, p. 164). The average of 87 cents to be computed from these data falls within the range of 75 cents to $1.00 that Seward referred to in 1854.[117] For 1860 similar census reports were used.[118] For both 1850 and 1860 the individual state rates were combined and weighted by the number of persons reported as laborers (nonfarm) by the population census.[119]

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[112] Quoted in BLS Bull. 604, p. 253. The Commissioner of Labor Statistics report gives an estimate of 56 cents for Ohio average earnings in 1840. This is palpably unreasonable for a general average, since wages back in 1832 were much higher according to tolerably reliable sources, and this observation was therefore ignored.

[113] *Congressional Globe*, Appendix, May 1842, p. 924.

[114] Paul Inglis, *A Letter to Mechanics and Workingmen on the Wages of Labor*, 1840.

[115] *Tracts for the People, No. 3, Mr. Buchanan's Low Wages Doctrine* (no date but probably 1856).

[116] *Congressional Globe*, Appendix, July 2, 1846.

[117] *Congressional Globe*, July 12, 1854, col. 1709.

[118] *1860 Census, Statistics of the United States*, p. 512.

[119] *1850 Census*, pp. lxx and lxxii; and *1860 Census, Population*, pp. 658–659 and 666–667.

1870

For 1870, census data on earnings rates in selected occupations were collected for each state, as in 1850 and 1860. The census data were not, however, tabulated because they were found to be inadequate.[120] Nevertheless, it is possible to develop a detailed array of information from the special study of immigration made by the Treasury Department's Bureau of Statistics.[121]

Distributions of earnings rates for farm laborers (monthly with board) and for common labor (without board) were examined in detail. These data are, with exceptions to be noted, internally consistent; that is, the rates for Rhode Island are reasonable in comparison with those for Massachusetts, New England rates compared with North Central rates, and so forth. They are also consistent with each other: the scatter diagram relating laborers' to carpenters' rates by state shows a close relationship. They are consistent with a set of detailed earnings rates by occupation for selected industries also shown in this study. And finally, the percentage change 1860-70 to be computed for these occupations, by states, from the independent 1860 data and these 1870 reports are consistent with the major economic trends by area. Moreover, they are consistent with average earnings data for cotton manufacturing, for wool and iron manufacturing as reported in the census volume on manufactures.

In reviewing these relationships, however, changes in four states had to be made in the Young data where they were clearly out of line with the general body of information. For this purpose the data were adjusted by other data on comparable occupation rates by Young. Thus, earnings of laborers in a number of individual industries as reported by Young were averaged, and then used to adjust his estimate for common laborers in general.[122] The individual state rates were then combined into regional and U.S. averages using state data on the number of nonfarm laborers as reported in the 1870 census of population.[123]

[120] *1870 Census, Population*, pp. xxxviii and xliii.

[121] Young, pp. 202ff.; and see the section on agriculture, above.

[122] For Connecticut, laborers' rates reported were 50 per cent above those in Massachusetts, while the New Hampshire rate was stated to be about 30 per cent above that for Maine and Vermont. Using additional detail shown by Young, the average of earnings of common laborers in cotton, wool, leather, paper, iron, hardware, and blacksmith's helpers was computed for all states, the scatter of this average against that for common labor then being used to adjust these two rates. For Maryland, reported a third below Delaware and Pennsylvania, a similar procedure was used. For the Pennsylvania carpenters' rate, reported a third below New York, the New York average was taken on the basis of near identical rates shown for a wide variety of other skilled occupations in New York and Pennsylvania.

[123] *1870 Census*, Vol. I, pp. 719ff. The undercount in the census of 1870 would have produced little bias in the combination of southern state estimates into regional groups; it would have slightly underestimated the weight for these groups in arriving at a U.S. average. The range of possible manipulation present in Alba Edwards's fundamental study (*1940 Census of Population*, Alba M. Edwards, *Comparative Occupation Statistics for the*

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The 1850–70 data estimated here compare as follows with those prepared by Edith Abbott and Wesley Mitchell (p. 627) from plant reports in the Aldrich and Weeks Reports:

	Abbott		*Mitchell*	
	(Aldrich	(Weeks	(manufacturing,	*Present*
Year	data)	data)	Aldrich and Weeks)	*Estimate*
			(dollars)	
1850	0.90	0.92		0.87
1860	1.01	1.03		1.04
1870	1.62	1.48	1.56	1.57

The reason for preferring the census and Young estimates to those in the Aldrich and Weeks data is relatively simple. Both census and the Young estimates were consciously made to represent over-all averages for laborers in each state. Contemporary thought and review was given to the comparisons among the state rates, to comparisons among the rates for laborers, farm laborers, various skilled and factory occupations, and domestics. The resultant figures hang together and report reasonable changes over time. They are therefore to be preferred, particularly for the earlier decades, to reports based on returns for a few plants on the East Coast: the Aldrich data relate almost solely to the northeast while the Weeks figures used by Abbott relate to seventy establishments, twenty-eight of which were in Pennsylvania (Abbott, p. 356, n. 101). These data report such unreasonable relationships as common labor rates in Michigan some 30 per cent above the average for Wisconsin; an average of $1.00 a day for Rhode Island as against $1.62 in Massachusetts and comparable figures for the other New England states (Mitchell, pp. 620ff). More important, however, is the substantial interplant variation in what are quoted in the Weeks Report as rates for the same occupations. The use of these rates from a small sample of reporters, though individually precise, involves a very high sampling error. The census and Young data, on the other hand, were intended to be representative of the average pay of laborers in each given state. The Aldrich and Weeks data were therefore taken as confirmation of the census and Young data rather than the other way around.

1880

The Mitchell data were used to extrapolate the 1870–80 movement once the 1870 level was given. Mitchell carefully gives the averages for

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United States, 1870 to 1940, pp. 141–144) suggests that no clear adjustment could be made here for laborers. The adjustment, if warranted, would mean no more than a few cents change in the U.S. average.

each state and for the "East" and "West" as a whole, although his latter category includes primarily North Central states together with a few South Central ones. Average change estimates for the South and West were deduced from the manufacturing census data and combined with the Mitchell data using the 1880 census count of laborers in each region to give the index used for extrapolating the 1870 figure to 1880.[124]

1860-1880: Annual Data (Table 5)

For interpolating between the decennial bench marks our requirements so far as accuracy of level is concerned are less rigorous, and the trend in the Weeks data, as developed by Edith Abbott, was used (Table 5). As indicated above, Miss Abbott's estimate of 1860-70

TABLE 5

Index of Average Daily Earnings; Nonfarm Labor and
Skilled Workers, Males, United States, 1860-1880

$(1860 = 100)$

Year	Nonfarm Labor	Skilled Worker
1860	100	100
1861	100	100
1862	104	102
1863	117	112
1864	139	136
1865	143	151
1866	148	161
1867	146	166
1868	145	169
1869	148	170
1870	144	172
1871	145	175
1872	147	173
1873	147	172
1874	139	166
1875	135	157
1876	131	148
1877	122	142
1878	120	139
1879	121	136
1880	127	138

[124] The Wright Report (p. xiv) gives data from which one can compute average earnings trends in each region. The change for the South (excluding Delaware and Maryland) was much the same as that for the North, while the essential stability in the West matched that in the North Central. Hence Mitchell's 18 per cent decline for 1870–80 in the Northeast (his "East") and 17 per cent fall for the North Central (his "West") were applied to the other regions as well.

change (derived from the Weeks data) conforms well to the estimate made above from census and Young data. Her estimate for 1870 is also close to that of Mitchell's for manufacturing laborers.

Mitchell's series for laborers, in general, and his series for unskilled workers, however, differ strikingly from hers, chiefly because of his inclusion of laborers and quarrymen in one New York City establishment and quarrymen in two Connecticut establishments. These three establishments dominate Mitchell's series by virtue of their heavy weight and it was, therefore, not used.

1889

For 1889, data on weekly earnings of unskilled male workers in boots and shoes, meat packing, flour milling, leather, cotton textiles, iron, and a variety of other industries are reported in the 1890 census.[125] For three additional industries—railroad, lumber, and chemicals—we can secure estimates of weekly earnings of unskilled workers from the major study by Davis R. Dewey, conducted as part of the 1900 census.[126] (Dewey provides data for still more industries, which are ignored here as relying on data for fewer than 1,500 hands. This restriction was made in order to use only the most reliable part of his retrospective reports.) The average from the 1890 census data was $8.39 per week; the average from the three Dewey industries was $8.37; the weighted average was $8.38 or $1.39 per day.[127]

Four check estimates were made from less satisfactory sources, but ones of some substance: the Abbott series based on a combination of the Aldrich reports; contemporary estimates of the well known economist and businessman, Edward Atkinson; the BLS data as combined by Coombs; and the complete set of payroll data shown by Dewey.[128]

[125] *1890 Census*, Vol. vi, Part 1, pp. 657ff.; Part 2, pp. 136, 206, 300, 373, 380, 390, 525, 573, and 589. Employers in most major industries supplied estimates of the number of unskilled workers and their payroll, the census computing weekly pay estimates from these and other data. I estimated the average for iron and steel workers by assuming that the 82,000 unskilled workers reported by the census were the lower 82,000 in the distribution of all 168,000 iron and steel employees by weekly wage that is shown by the census—and computed an average for that group.

[126] *1900 Census*, Davis R. Dewey, *Employees and Wages*, ch. 2.

[127] The 1890 census data for individual industries were weighted together by the number of unskilled workers in each as reported by the census together with the earnings data. The Dewey industry averages were weighted together by the number of male unskilled workers in these industries in 1900—derived by computing ratios of unskilled to all workers from the Dewey data and applying these to the 1900 census count of the number of workers in each industry. The over-all average was computed by using these same weights.

[128] Dewey, ch. 2. Whitney Coombs, *The Wages of Unskilled Labor in Manufacturing Industries in the United States, 1890–1924*, Columbia University Press, 1926, Appendix Table A. Coombs's own weighted average appears in his Table 5. Paul Douglas (p. 165) utilized estimates of Ralph Hurlin but no information is given on their method of estimate. Their level is close to that of Coombs's data. Edward Atkinson, "Productive Industry," in N. S. Shaler, *The United States*, 1894.

These yield figures ranging from $1.33 and $1.37 to $1.45 and $1.46 a day, compared to the present $1.39. These sources are inadequate because they rely on far smaller samples than the 1890 census reports provide, while the coverage of Atkinson's estimate is unknown. All four sources suffer the added shortcoming of being based on retrospective reports for a sample of identical firms. They thus ignore the shifts in employment distribution between new and old firms, between the North and the South, and so forth, that occurred between 1889 and the time when the data were collected. Hence, they should not be a primary point of reliance, but they do broadly confirm the present estimates.

The present estimate for earnings of labor is consistent with the averages by industry shown in Table 2 because they are derived from the same source. For example, the average of $1.39 for unskilled male labor is the weighted product of earnings figures for individual industries, one of which is $1.28 for unskilled male labor in cotton textiles (from the same report). This figure in turn is consistent with the average of $1.29 for all males 16 and over in cotton textiles (derived from the same report).

CARPENTERS

There is no dearth of guesses at the rates received by carpenters or other skilled mechanics in the earliest decades of the nineteenth century; guesses high, guesses low, guesses conflicting with each other and with reasonable data for other occupations from tolerably reliable sources. We can, however, trace a thin thread of consistency through these data, leading to a set of not wholly irrational estimates.

For 1815 a general average of $1.50 is given in one contemporary source in the context of other wage and price data.[129] Another contemporary source cites a $1.50 average for Maine and New York.[130] While Carroll Wright cites somewhat lower figures (*History of Wages*), they do not controvert a $1.50 average. He has provided a good many figures—and a good many puzzles. He quotes rates for carpenters "high," "medium," and "low" but one has no basis for judging whether the average at any time is more like the "medium" than the other rates, or even whether the trend over time can adequately be suggested by the high, medium, or low. He cites an 1815 "high" rate at $1.00 midway between figures of $1.43 for 1813 and $1.42 for 1817—hardly a likely trend. His 1816 "medium" figure for carpenters' wages is actually below the rate he estimates for common labor. His figures are thus an excellent demonstration of the inadequacy of using a tiny sample of

[129] *A Review of the Trade and Commerce of New York.*

[130] Weeden in 1819 (BLS Bull. 604, p. 57). Weeden estimates a $1.00 rate for Ohio. With most mechanics resident in the East no significant weighting need be given to this estimate.

direct reports. However authentic they may be, the resultant trends are quite unrealistic. We are better off (though hardly well off) in using a contemporary judgment estimate that at least attempts to be representative. Data for Philadelphia in the 1812–15 period run somewhat lower than the $1.50 level, but the average for 1815 can be assumed to have been above that for the period as a whole.[131]

For 1825 we have an estimate of $1.45 from Zechariah Allen (p. 347). For practical purposes we can take this as indicating the same level as 1815. (This is not to imply that the average remained unchanged under the impact of the end of the war and the sharp recession of 1819, but merely that the rate appears to have recovered to its 1815 level.)

As an indication of the level of earnings paid to male labor about 1810 we have two figures from the Gallatin report, one direct, the other quite indirect.[132] Male employees in a New Hampshire fulling mill were paid $20 a month, with apprentices (presumably at boys' rates) paid $10 a month. Cost data are given for a hat manufacturer in Albany and these too suggest a $20 to $25 range.[133] Since the rates paid "manufacturers" and "mechanics" are frequently commingled in contemporary reports, we may take this as indicative of the rates paid carpenters. With agricultural labor rates quoted generally at $10 a month with board or 75 cents a day, one could translate this tissue of hypotheses into an estimate of $1.50 a day for carpenters at this period. This is actually quite close to the 1825 figure of $1.45 estimated by Zechariah Allen.

1840

We have the possibility of figures for carpenters in 1840 if we trust data for Massachusetts carpenters and joiners that suggest a rise of perhaps 5 per cent from 1840 to 1850.[134] This ratio, applied to the 1850

[131] William A. Sullivan, *The Industrial Worker in Pennsylvania, 1800–1940*, 1955, p. 7.

[132] *American State Papers, Finance*, Vol. II, pp. 430ff.

[133] *ibid.*, p. 437. Coxe gives selling price and components of costs, including "making and finishing" for three price grades of hats, as well as numbers of hats produced under three quality grades. Computing ratios of making and finishing costs for each type, and weighting, gives a cost ratio of 26 per cent for labor. This figure, applied to Coxe's figure for total value of output and divided by the number of employees, gives $25 a month. Some of this cost must have included other than direct production labor costs, giving, say, a $20 to $25 range.

[134] For 1835 and 1845 reports, for carpenters and joiners (summer and winter high earnings and low earnings), and for 1845 and 1850, for carpenters in cordage, are shown in Wright, *History of Wages*, p. 164. The high and low rates were averaged on the assumption that these reports were more reliable than some kind of office averaging used in giving medium reports. The rise of 5 per cent from 1835 to 1845 was assumed to have all occurred by 1840, gains during the bleak years 1840–45 being unlikely. The gain from $1.42 to $1.50 in the next quinquennium was therefore used to extrapolate the U.S. figure of $1.47 back to 1840. Other data shown by Wright were not used because they were not comparable from 1845 to 1850.

estimate, gives $1.40 for 1840. Given the recession of 1837–39 a decline from $1.50 in 1825 to the $1.40 in 1840 seems not unreasonable.[135]

1850–1870

For 1850 and 1860 the census reports and for 1870 the Young Report were used in the same way that they were used above for estimating rates paid common labor.

1880

For 1880, individual state rates as reported by the BLS were weighted by the number of carpenters in each state to give an average of $2.23.[136] This figure is about 25 per cent below the estimate for 1870, reflecting the process of postwar deflation. An estimate of a 20 per cent decline would be deduced from the Aldrich Report data for carpenters in manufacturing and 30 per cent for carpenters in building trades, so that the present estimate is reasonably consistent with the trends shown in the latter data for (by and large) the northeastern states.[137]

1889

Separate estimates were made for the earnings of carpenters in individual manufacturing industries and in the building trades, then weighted together to give the final estimate of $2.37. For individual manufacturing industries the ratios of carpenters' weekly earnings to those of laborers were computed from data in the Dewey study for the 1900 census. These were then averaged, and applied to the over-all laborer's figure estimated above. This procedure produced a consistency between these laborers' and carpenters' wage rates. More to the point, it utilizes the broadly based laborer's rates for many industries to give a solider foundation for the carpenters' average. For the building trades, the BLS state estimates were used (BLS Bull. 604, p. 163). These individual state estimates were weighted together by the employment of carpenters in each state as shown by the 1890 census.[138] The $2.38

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[135] One may note an estimate of $1.50 a day for "American labor" in the production of manufactured goods—a figure without specific attribution but presumably referring to the more highly skilled labor in manufacturing (cf. *An Address to Working Men on the Low Prices of Wages, by a Mechanic,* 1840, p. 3).

[136] Rate data from BLS Bull. 604, p. 162. Gainful worker data from the *1880 Census,* Vol. I, pp. 780ff.

[137] Aldrich Report, Part I, pp. 113–166. An average of the relatives shown for individual plants was made to give the figures used above. Mitchell (Table 40) shows a decline of about 20 per cent for skilled workers generally in manufacturing. Being more broadly based than the Aldrich data for the East—including the West—but limited to manufacturing, one can say that it seems generally consistent with the above estimates.

[138] *1890 Census,* Vol. I, Part 2, Table 79. These reports covered states with well over 80 per cent of all carpenters. To prevent bias, the remaining states were included by reference to those reported. For example, for Minnesota, the average of Wisconsin and Michigan rates were used; for Kentucky, the Tennessee rate, etc.

estimate thus secured is extremely close to the $2.31 computed above for manufacturing from entirely independent sources. The weighted average of $2.37 is up 6 per cent from the 1880 level, as against the rise of about 11 per cent shown in the Aldrich Report figures of Hewes's series for machinists.[139] Given the geographic bias in these latter sources, the difference is not a disturbing one.

1899

For this year a procedure similar to that noted above was followed, using estimates derived from Dewey's figures for 1899 and the individual state BLS estimates. These latter were weighted together by the employment of carpenters in each state as shown by the 1900 census (*Occupations*, pp. 98ff). Since the BLS reports did not cover every state, an allowance was made for the major omitted states.[140] The over-all building and manufacturing rates ($2.31 and $2.20, respectively) were then weighted together by the number of carpenters in each group.[141] The resultant figure of $2.30 is equivalent to an annual rate of $716.

How can this figure be checked? One indicator is the average of $629 to be derived from the 1901 cost of living study.[142] The latter figure, however, reflects the heavy unemployment characteristic of construction even in reasonably good times. Computing a rough estimate of 15 per cent time lost from the 1900 census unemployment data (*Occupations*, pp. 8 and 76), and reducing the $716 by 15 per cent gives us $608, a figure virtually identical with the $629 based on the cost of living study data. (Because of understatements in the reporting to the census, it is certain that the true unemployment allowance should be much greater.[143] On the other hand, the cost-of-living study was restricted to heads of

[139] The Aldrich data for thirteen establishments in manufacturing, quarrying and railroads (pp. 113, 123, 140, 148, 160, 163, and 166) show a rise of 8 per cent, with a greater rise for all building trade reports but one. Fletcher Hewes, *The Facts in a Nutshell*, Henry F. Clark, 1892. Hewes secured his data "from special reports of manufacturers furnished for these charts," apparently as part of the McKinley campaign, for he co-authored a similar book with McKinley.

[140] The BLS reports covered almost completely the major groups of carpenters, those employed in eastern states. An average of the reported $1.97 rate for Michigan and $2.22 rate for Ohio was used for Indiana, Iowa, Kansas, Minnesota, Missouri, and Wisconsin in preference to giving them the implicit average derived by merely reported states. Kentucky was taken as the average of Virginia's $1.62 and North Carolina's $1.59.

[141] The 1910 census (Vol. IV, pp. 91 and 302ff) gives a distribution of carpenters by industry, indicating roughly a seven to one ratio for construction versus manufacturing aside from small numbers in other industries. Reference to the 1930 census distribution suggests sufficient stability in this proportion to make its use for 1889 a reasonable one. (However, even a six to one or eight to one ratio would give similar results.)

[142] *Annual Report of the Commissioner of Labor Statistics*, 1903, p. 283. Medians were taken for each class interval, then weighted by the distribution.

[143] The reasons for believing that the unemployment total is understated appear in the writer's "Annual Estimates of Unemployment in the United States, 1900–1954," in *The Measurement and Behavior of Unemployment*, Princeton University Press for NBER, 1957, pp. 232ff.

"normal" families and heavily oversampled trade union members, thus creating a parallel bias in that source.) As another check, we can compute a daily average of $1.86 for employees for carpentering firms in 1899.[144] But since this lower figure reflects not merely, say, 15 per cent unemployment, but also the effect of including low rated laborers, draymen, and so forth (as well as carpenters), this average is not inconsistent with the estimate of $2.30.

REAL WAGES

1800-1860

For 1800-60 the Warren and Pearson wholesale price index was used to indicate the rough range of wholesale price change.[145] In computing the real wage figures these changes were substantially damped to allow for the difference between wholesale and retail price movements and further adjusted to allow, in the earlier years, for the small element that cash wages was in total wage receipts. The resultant estimates are hardly removed from careful guesswork. For 1860-80 we have Mitchell's (p. 76) cost-of-living index for the East, and for 1890-1900 that of Paul Douglas. Table 6 compares movements in money wages, prices, and real wages.

TABLE 6

Trends in Wages and Prices, United States, Selected Periods, 1800-1880
(percentage change)

	MONEY WAGES		PRICES		REAL WAGES	
Year	*Nonfarm*	*Farm*	*Wholesale*	*Retail*	*·Nonfarm*	*Farm*
1800–18	−10 to 20	−5 to 10	+10 to 15		−10 to 20	a
1818–30	a	−5 to 10	−40		−0 to 10	a
1830–40	+10 to 20	+15 to 25	a		+10 to 20	+15 to 25
1840–50	a	a	−10		a	a
1850–60	+5 to 15	+20 to 30	+10	+10	+0 to 10	+15 to 25
1860–70	+60 to 70	a		+56	a	−0 to 10
1870–80	−15 to 25	−15 to 25		−20	a	−10 to 20

a Change of less than 5 per cent.

The wage trends are based on data in Table 2. Wholesale price trends are based on the BLS and Warren and Pearson series in *Historical Statistics of the United States, 1789–1945,* Dept. of Commerce, 1949. Retail price trends 1860–70 are based on Mitchell's estimates (p. 91), other decades on Ethel Hoover's series from her study in the present volume.

[144] *1900 Census,* Vol. VII, Part I, p. cxix. BLS city data, of course, are above the level of these figures.
[145] *Historical Statistics of the United States,* Dept. of Commerce, 1949, p. 232.

1860–1880: Annual Estimates

For interpolation over the 1860–80 period the obvious source is Mitchell's classic study. Mitchell disposed of the earlier work of Falkner for the Aldrich Committee as decisively as possible—although time suggests that what appeared to Mitchell, Waite, and others as more malice than incompetence may in fact be the reverse.[146]

The Aldrich data are distorted in a number of significant respects, and the Mitchell indexes, relying on them, partake in some measure of these distortions. Thanks to Mitchell's superlative analysis of the elements in the wage trends over this period and his great care in outlining his procedures and reporting his data, it is possible to be quite explicit on this point. Briefly, Mitchell's indexes are biased as a measure of over-all wage trends, of those for cotton textiles, building, railroads, and possibly wool textiles.

1. A marked bias in his index of wages for all industries, for selected occupation, wage interval groups, and so forth (Tables 33, 37, 39, 40, 42, and 44) appears for a cause noted by Mitchell himself; namely, the inclusion of the New York City department of public works. He inferred that excluding this set of reports would produce "a fairer index of the course of wages."[147]

2. The Aldrich Reports for the major industry of cotton textiles, which account for one-quarter of all industrial employment in the Mitchell index and nearly one-half of his manufacturing employment total, are also biased.[148] This can be seen by analyzing the Aldrich data for key occupations in the three cotton textile firms that make up Mitchell's cotton textile sample:[149]

	Plant Number				
Occupation	*41*	*43*	*38*	*40*	*39*
Reported number of:					
Machinists	1	6	8	17	24
Weavers	53	200	0	20	19
Frame spinners	15	19	0	0	28

[146] A fortiori, Mitchell's work has revealed the inadequacy of such direct use of the Aldrich data as was made in the *Monthly Labor Review* for February 1921, and reprinted in BLS Bull. 604 (cf. on this point the excellent study by Witt Bowden, "BLS Historical Estimates of Earnings, Wages and Hours," *Monthly Labor Review*, July 1955, p. 806).

[147] Mitchell, p. 229. These reports are excluded in Tables 65–68, and pp. 145, n. 3, and 167, n. 6.

[148] Mitchell (p. 120) showed January 1860 employment of 1,422 in cotton textiles compared to a manufacturing total of about 3,300 for textiles, metals, and illuminating gas plus white lead (cf., however, Mitchell's 3,683 in Table 65).

[149] Judging from his appendix, Table 5, he did not utilize the data for establishment 41, in New York.

If an obviously substantial plant, such as number 43, required only six machinists to service the looms and spindles tended by nineteen spinners and 200 weavers, we must assume that plant number 40, with seventeen machinists, had far more than twenty weavers and a few spinners.[150] In lesser degree the omissions for the other establishments will likewise be significant. We are undoubtedly confronted by a set of reports that included only one group of weavers (say of one size cut) or one group of spinners or had some other type of limitation. The net distortion involved is suggested by the fact that whereas the Aldrich sample shows as many females as males in cotton, the census shows 60 per cent more.[151] The problem is further complicated by the fact that, for one of the three firms on which the cotton textile figures rest, the wage quotation of the dominant occupation—weavers—is merely on the rate paid per piece and therefore does not reflect the undoubted rise in earnings as productivity gained.[152]

3. The Aldrich Reports for woolen textiles appear to be biased as well. The Mitchell index gains 49 per cent compared to the 71 per cent he shows for cotton textiles from 1860 to 1866.[153] But a contemporary estimate by David A. Wells indicated that the gain in both industries was much the same, at 66 to 67 per cent.[154] Given the few establishments reporting in the Aldrich study, no great confidence can be placed in this reported much smaller gain attributed to wages in woolen manufacturing.

4. The Aldrich Report data for railroads—actually one railroad in Massachusetts—relate to skilled workers and include no data for laborers, but the 1910 census showed roughly half of steam railroad employees classified as laborers.[155]

5. The combination of industry index into an over-all index based on the Aldrich data would lead to biased results even if each industry index were satisfactory. This is so because it overweights some industries. While the census shows somewhat less employment in cotton goods than leather, for example, the Aldrich data show twenty times as much. While the census shows roughly 70 per cent as many employees in

[150] The plant report includes no data for mule spinners prior to 1872, 1 frame spinner in July 1859, and 10 in January 1864 (Aldrich Report, Part 3, pp. 799–802).

[151] Mitchell (p. 122) cotton plus ginghams and *1860 Census, Manufactures*, p. 735.

[152] Aldrich Report, Part 3, p. 829, establishment 40. Weavers' earnings computed for this establishment rose by 19 to 34 per cent, 1860–70, whereas earnings in the two other establishments gained 77 and 114 per cent. Independent estimates of David A. Wells are much more consonant with the latter figures.

[153] P. 109. I average the January, July, and subsequent January reports.

[154] Wells Report.

[155] Mitchell, pp. 498–499; and Edwards, Table 9.

carriage construction as in wool, the Aldrich data show only about 20 per cent as many.[156]

Because of the limitations of the industry series based on the Aldrich data, special interest attaches to the remarkable analysis Mitchell made of the data on trends by occupation groups and by wage interval groups. Here can be seen his masterly analysis of the propagation of business cycles, and indeed the germ of the subsequent diffusion index developed by the National Bureau. But if one looks at these data merely from the more limited viewpoint of how they fit into a wage index calculation, one finds a marked bias in the series for unskilled labor. The bias arises from the substantial overweighting of two reports from New York City. Some 2,100 of the 2,800 unskilled workers covered by this index were employed in two establishments—New York City public works and the gas works.[157] This group of workers showed wage gains of well over 100 per cent in the 1860–70 decade. This is why Mitchell's index for unskilled labor rises by 108 per cent over a decade in which the U.S. average shown in Table 2 above rises only 52 per cent; the Abbott figure based on Weeks data rises about 43 per cent; and an unweighted average that Mitchell himself computed in an appendix (for manufacturing laborers in the East) rises only 56 per cent.[158]

6. An adequate set of figures for females could perhaps be derived from the Weeks Report in combination with the Aldrich data. Thus for female weavers the three Aldrich establishments show 1860–70 earnings gains of 10 to 34 per cent, 77 and 114 per cent, while from Weeks's figures for two giant mills we find Chicopee showing a 100 per cent gain, and Merrimac, one of less than 50 per cent.[159] Since Mitchell's index for females is dominated by the change in rates reported for a few occupations in a few cotton textile establishments, the reliability of such

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[156] Mitchell (pp. 93 and 104) gives the employment weights for his sample of Aldrich data. The census figures (including boots and shoes with leather, worsted with wool, wagons with carriages) appear in the *1860 Census, Manufactures* (pp. 735ff.).

[157] Mitchell (p. 124) shows 2,800 laborers in thirty-nine establishments. His reference tables show 1,500 laborers in establishment 35 and 208 in establishment 47. Comparison between this count of establishments and the twenty-seven listed in an appendix table (pp. 620ff.), together with the numbers involved, shows that Mitchell must also have included the 340 quarrymen in New York City establishment 35 plus 400 in Connecticut quarries 79 and 80.

[158] Mitchell, p. 627. This average combines both Aldrich and Weeks Reports. Edith Abbott's inclusion of Weeks's central and western reports would tend to make her gain less than one based on the East alone, as Mitchell's was. Actually, Miss Abbott for 1866, 1869, and 1879 shows figures virtually identical with those appearing in Mitchell's appendix (p. 627), differing slightly for 1875, presumably because Mitchell averaged January and June figures—giving too high a result in a year with a sharp fall in wages.

[159] Weeks Report, pp. 347–349, and 356. The Cocheco report reflects little more than errors in transcription. It is hard to believe that weavers' rates rose from 36 cents to 93 cents between 1865 and 1867 while gains in other Weeks establishments were one-third or less. Also, it is all but impossible to believe that the rate rose from 67 cents in 1874 to $1.15 in the depression year of 1875.

reports must be more broadly demonstrated than the high sampling variability would suggest as possible if we are to develop adequate series.

Insofar as these industry series suffer from improper weighting, one could merely reweight them using census employment weights. However, as noted above, there are biases in the series for cotton textiles, and probable difficulties in those for wool and railroads. No less important is the problem of what wage movement to attribute to omitted industries. Mitchell is careful to note that the Aldrich data permit making estimates for only a few industries in any reliable fashion.

For male skilled workers, and for foremen and overseers, the data were taken from Mitchell's Table 40, his coverage being broad, reasonable and reliable. For laborers, the Abbott series (based on Weeks data) was utilized, since it shows virtually the same net change as the benchmark data in Table 2 and fits closely the manufacturing laborer reports summarized by Mitchell. No attempt was made to derive an estimate for females because of the complexities above—nor, therefore, for both sexes combined.

RELATED ESTIMATES

Previous estimates for wage trends during the nineteenth century have been prepared by a number of specialists. The well-known figures of Mitchell (1860–80) and Layer (cotton textiles) have been discussed above in some detail. Those of the Aldrich Report for 1860–80 were destroyed beyond hope of recall by Mitchell's analysis, and the Aldrich estimates for 1840–60 would be even less satisfactory. Alvin Hansen utilized the Aldrich estimates for 1840–60 and Mitchell's for 1860–80; hence the above comments apply.[160] Rufus Tucker used Carl Snyder's work for 1840–1900, this in turn being a combination of the Mitchell series, W. R. Burgess's series for the end of the century, the BLS index of hourly rates (BLS Bull. 604), and the Hansen index.[161] There is a certain redundancy about this since the Aldrich series form the starting point for the Mitchell series, the BLS hourly rate series, and—via the Mitchell series—for the Hansen series and is therefore used three times in the Tucker series. The BLS series, according to Witt Bowden, is simply the Aldrich series adjusted for changing hours worked per day. It uses the unsatisfactory Aldrich estimates for hourly as well as for daily rates.

One basic source of which little use has been made except by Mitchell is the Weeks Report for the 1880 census. This has been worked over

[160] Alvin Hansen, "Factors Affecting the Trend of Real Wages," *American Economic Review*, March 1925.

[161] Rufus Tucker, "Real Wages under Laissez Faire," Barron's, October 23, 1933; and BLS Bull. 604.

for the 1860–90 period by Clarence Long in an unpublished study for the National Bureau. That study should make a substantial contribution to our knowledge when it becomes available.

COMMENT

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Lebergott's paper inspires awe at what has been attempted, admiration for what has been achieved, and, it must be admitted, a bit of uneasiness about some of the results. Clearly, the great strength of the paper is its resourcefulness in uncovering new information, in piecing together bits of data, and in checking them for internal consistency. Even if some of Lebergott's estimates eventually prove to be wide of the mark, they will certainly stimulate further work and ultimately lead to a clearer picture of wage trends.

This paper takes a big step in liberating work on nineteenth century wages from the dominating influence of the Aldrich and Weeks reports, which, despite their obvious inadequacies, have long been the major sources. I spot only one omission; Lebergott has not used the annual reports of the state labor bureaus, which provide valuable data after about 1870. For many of the sources with which I was unfamiliar, I wish the paper had provided more information on the number of establishments and employees covered.

The use of employment and payroll data from the census of manufactures to estimate daily wages in the cotton textile industry for 1850–99 seems to me to be a valuable technique. Census data have several major advantages. They are not retrospective like the Weeks data, nor confined to firms that survive to a much later date like the Aldrich data. Most important, they have virtually complete coverage, while almost all other sources are based on very small samples limited in geographical coverage and heavily overweighted with the largest firms.

Some of the estimates based on more limited sources seem high. The result may be some distortion of the wage differentials among occupations and industries. I find it hard to reconcile an estimated wage for common labor in 1899 of $1.41 a day with an estimated daily wage for all male occupations in cotton textiles of $1.19 (Table 2). I suspect that the latter is closer to the mark.

As for the estimates of real wages, this paper reminds us that much needs to be done on cost-of-living indexes, although Mrs. Hoover's paper in this volume helps to fill the gap. Cost-of-living indexes before 1914 have too often been afterthoughts attached to works on money wages. Lebergott is to be commended for avoiding the least adequate of the indexes in current use, that of Randolph Burgess. Table 6 of his

paper suggests almost no rise in real nonfarm wages between 1800 and 1880. This is hard to believe for a period that saw the full transition from handicrafts to large-scale industry. The general reasonableness of these results should be checked against estimates of the growth of national income per capita and similar data.

We must be cautious in accepting the smallness of the rise in real wages and attributing it to immigration. In comparisons over time, immigration at the earlier date has an influence opposite to that of immigration at the later date; that is, only the net change in immigration as a fraction of the population is relevant. Though immigration must have tended to keep down the wages of the unskilled, individuals could rise through the skill hierarchy more rapidly in a growing labor force than in a stable one.

A similar puzzle is provided by estimates of real wages in the North during the Civil War. Lebergott's estimates, like Mitchell's, show a large decline. There must have been opposing forces at work: a decline in civilian output per capita tending to reduce real wages, and a severe labor shortage tending to raise them. We need to know more about both of these forces to judge whether the measured decline in real wages is reasonable.

The inferences drawn in the first part of Lebergott's paper sometimes seem to overreach the data. For instance, the data are insufficient to show discontinuities in the free competitive labor market. It is often hard to document discontinuities even when differences in working conditions and in the skill content of jobs can be investigated at first hand; surely they cannot be established from wage rates alone.

There is a similar overreaching in some of the remarks on slavery; for example, the statement that free labor had a sixfold advantage over slave labor. We cannot know whether the isolated cost figure cited is typical, whether it includes the cost of supporting members of the slave family, or how it treats the complex issues raised by the capital costs of slaveholding. Again, Lebergott emphasizes that the freeing of the slaves created a new supply of wage labor, but no mention is made of the fact that it also created a new demand. I am not surprised that wages of skilled building-trades workers rose as much in the South as in the North despite the end of slavery. The South must have suffered much more extensive war damage to buildings.

Such defects are a small price to pay for the breadth and originality of this paper. In economics, as elsewhere, we seldom get ahead unless someone is willing to stick out his neck.