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 resultant 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 pre-
vailed over this period, with some indications of $1.00 being the common
rate for the early decades, while the lower figure appears more fre-
quently 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 com-
manded $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 contempla-
tion," 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,

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[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]

[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]

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[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*

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

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[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

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[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

[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.

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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

[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

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[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.