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## CHAPTER 4

### The Buying Power of Wages and Earnings

#### *The Previous Indexes of Living Cost*

The index of cost of living used in this study (Tables 17 and A-10) was constructed by linking a new index for 1860-80, prepared by Ethel D. Hoover from retail price data gathered by the Weeks Report,<sup>1</sup> to a new index of retail prices for 1880-90, prepared by this writer from various documentary sources (Appendix Tables B-1, B-2, and B-3).

These indexes are definitely preferable to the indexes of essentially wholesale prices used by Falkner or Hansen, despite the fact that the wholesale prices apply to more commodities and were collected in greater abundance and possibly with more precision as to quality-grade and date. The prices used in this investigation were the prices presumably charged the working man. They could deviate widely from wholesale prices among different localities because of transportation cost from the wholesale markets, or differences in degree of competition among retail stores or differences in quality, in credit policy, and in delivery service. They could wander widely from the path followed by wholesale prices over time, because retail stores absorb wholesale price increases at some times or increase their margins at other times—depending on competition, store policy, and consumer resistance, on variations in wages of store and delivery clerks and cost of fuel, light, and heat, or on changes in the standards of cleanliness and attractiveness of packaging. Also, retail prices can be collected for finished goods and services of the kind not ordinarily reported in the nineteenth century sources on wholesale prices—confined as the latter usually were to basic or raw materials.

An alternative to the Hoover-Long index of living cost would have been the Mitchell index of retail prices for 1860-80 and the Burgess index of food prices for 1880-90. Mitchell constructed his index entirely from tables of retail prices published by the 1880 census, and gathered by investigators under the direction of Joseph D. Weeks, who had sent out schedules to shopkeepers of a large number of towns, asking them to enter the retail price of the product listed, for as many years as they could. The price asked for was the "fair average" for the year or the price for June 1 of each year.<sup>2</sup>

<sup>1</sup> Ethel D. Hoover, "Prices in the Nineteenth Century," *Trends in the American Economy in the Nineteenth Century*, Studies in Income and Wealth, Vol. 24 (in press).

<sup>2</sup> *Average Retail Prices of Necessaries of Life*, by Joseph D. Weeks, *1880 Census*, Vol. xx, Supplementary Report, pp. 1-111. The schedules were not reproduced.

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The Weeks Report listed about 400 tabulations of retail prices of detailed items (such as "shirtings, brown, 4 × 4, standard quality") in the amount of each item that would be purchased for a family's use. It listed them under the name of the reporting firm, identified by town and state. It included only "what might be regarded as the chief necessities of life," and all the detailed items tabulated belonged to the following categories: "plain" board, groceries, flour, meat, provisions, etc.; drygoods, men's heavy boots; coal, wood, and oil; house rent, generally for four- to six-room houses. The intention was to obtain price data covering the towns for which the wage schedules were drawn. These represented sixteen states in nearly all sections of the country; most of the tabulations, however, were drawn from a few cities or towns in Connecticut, New York, Pennsylvania, Illinois, Indiana, Missouri, and Ohio.<sup>3</sup>

From them, Mitchell rejected all series of quotations not expressly stated to show the "fair average" of prices and not approximately complete for the entire twenty years 1860-80. He converted each series he used to 1860 = 100, and computed unweighted averages of relative prices from different towns for the same commodity. This process resulted in 60 national series of relatives, many of which he then grouped together by computing simple averages for closely related commodities—reducing the number of series to 35.

Each of the 35 series of commodity price relatives was next weighted in accordance with its importance in the budget of a working-class family, taken from the expenditures of 2,567 families surveyed for 1901:

	<i>Number of Retail Price Series Used by Mitchell<sup>a</sup> for 1860-1880</i>	<i>Percent of Average Family Budget Spent on Each Item<sup>b</sup> (2,567 families in 1901)</i>
Food	24	31.6
Fuel	3	4.2
Lighting	1	.5
Clothing	4	3.1
Rent	1	16.0
Sundries	2	.3
Other items <sup>c</sup>	0	44.3
	<hr style="width: 10%; margin: 0 auto;"/> 35	<hr style="width: 10%; margin: 0 auto;"/> 100.0

<sup>a</sup> Mitchell, *Gold, Prices, and Wages*, p. 84-85.

<sup>b</sup> Average expenditure on each kind of goods for those families which bought the goods. *Eighteenth Annual Report of the Commissioner of Labor* (1903), pp. 510, 569.

<sup>c</sup> That is, items for which no prices are included in the Mitchell study: food, 10.9 percent; clothing, 11.9; miscellaneous (liquor, tobacco, insurance, religious and charitable expenditures, sickness, etc.), 21.5.

<sup>3</sup> *Ibid.*, p. 2.

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Despite the care with which Mitchell constructed his cost-of-living index, his own appraisal of its accuracy was not high. Data were available for relatively few localities. Weights for some commodities were based on conjecture—family expenditures rested on a small sample of budgets collected after 1900, as a measure of importance of commodities bought and used twenty to forty years earlier. Since items totaling approximately 44 percent of the expenditures were unrepresented in the index, it involves the assumption that their prices moved in the same way as those for which Mitchell had price data. Specifications were necessarily loose; for instance, “the flour given in one table may be of a higher or lower grade than that in another.” It was not certain as to what time of year the prices refer to. The sparseness of the returns did not allow him to match the price data by locality with the wage data. Finally, the deep South was not represented; his index covered only the East and West—typically only one or two cities in each of six to a dozen states.

The Burgess series for the decade 1881-90, was still less adequate, since it relied entirely upon the “retail prices of 10 staple articles of food which constituted the bulk of all goods purchased in the average wage earner family.” Burgess felt that the index was a reasonably satisfactory indication of living cost, on the ground that food represents nearly half of the typical family budget, and that “the trends which it has been possible to construct for the retail price of clothing, the price of rent, and of fuel . . . show a remarkable resemblance to the food curve.” However, he gave little information on sources beyond the fact that “from a number of different sources sufficient quotations were secured for each year to give a representative figure.”<sup>4</sup>

The decision not to use the Mitchell and Burgess series in this study was based partly on the narrowness and the vagueness of the Burgess index, partly on our discovery of some new retail price series for 1880-90, and partly on the fact that Ethel D. Hoover of the Bureau of Labor Statistics had just made available a new series from 1860 to 1880—which rests, as did Mitchell’s index, on Weeks Report data on retail prices, but makes use of modern statistical methods of the kind now employed by the Bureau of Labor Statistics in constructing its current consumer price index, and obtains strikingly different results from those of Mitchell.

<sup>4</sup> W. R. Burgess, *Trends of School Costs*, Russell Sage Foundation, 1920, pp. 51-53.

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*The New Consumer Price Index*

THE HOOVER INDEX FOR 1860-80

Miss Hoover's method differs from Mitchell's in five important respects:

*Data.* She relies almost entirely on the Weeks data but makes much fuller use of them by including the price series which covered less than the whole period of twenty years—for example, 1869 to 1880 or 1875 to 1880—or which referred to only one month in the year. She found that the price data referring to the one month in the year conformed well in timing and degree of change to the average for the year.

*Averaging of prices of the same commodity in different localities.* Miss Hoover computed two averages of actual prices for each commodity in each year—one for firms in various localities reporting for both the given and preceding year, and one for firms reporting for the given and the following years. She then linked these together to form a continuous chain index with 1860 as 100. This index was multiplied by the average actual price in 1860 to obtain the average price for each year to 1880. Her use of link relatives enabled her to include several times as many series as Mitchell, and her averages of actual prices enabled her to avoid a serious upward bias which can result from averaging relatives. Such a bias will be found to be an important part of the explanation of the differences in results. Neither Mitchell nor Miss Hoover found it feasible to use weights in combining the series of different cities into an average.

*Weights.* Miss Hoover weighted the prices of the different groups of commodities such as food and rent by expenditures of families in Massachusetts in 1875, instead of the 2,567 families in 1901 used by Mitchell. The two sets of weights were very similar for food, but the Massachusetts expenditures gave greater percentage weight to clothing prices, which had a downward trend, and less to rent, which had an upward trend:

	<i>Mitchell</i> 2,567 U.S. Families, 1901	<i>Hoover</i> Massachusetts Families, 1875
Food	56.7	57.4
Fuel	7.6	7.0
Lighting	0.9	—
Clothing	5.6	15.2
Rent	28.7	17.7
Other	0.5	2.7
Total	100.0	100.0

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Miss Hoover allocated individual items within groups (e.g., butter and cheese within food) on the basis of the expenditure study of 232 families made for the Aldrich Commission in 1890-91. She assumed that items for which no prices could be obtained moved in the same way as all items other than food, in order to avoid adding to the very large weight already given to food. These expenditure values for 1875 were extrapolated back to 1860 by dividing 1875 values by price indexes for each item, on the 1860 basis. "This procedure (and the procedure used for calculating the index) assumes that the quantity purchased remains the same over the years. This assumption seems more reasonable than that implied by fixed percentage weights."<sup>5</sup>

The formula used,

$$I = \frac{\left[ P_o Q_o \left( \frac{P_i}{P_o} \right) \right]}{\Sigma P_o Q_o}$$

is equivalent to saying that the prices of each commodity and group were weighted by dollar expenditures at the base date.

*Additional items.* Miss Hoover included retail price data for a few items additional to those in the Weeks volume. These were shoe repair, medical care, and overalls in Vermont,<sup>6</sup> and newspapers and fruit.

The methodological differences between Mitchell and Hoover are reflected in large discrepancies in the major movements of their retail price indexes, even though they both move in the same direction in nineteen out of the twenty years.

The Hoover index showed the cost of living rising by almost the same amount as Mitchell's during the Civil War (though reaching a peak a year earlier), but declining much more rapidly, so that it was always lower after 1864. The gap was wide by 1866 and kept gradually growing. By 1875 the Hoover index was only 123, compared with 138 for the Mitchell index; and by 1880 it was only 110 compared with 128.

The upward bias in the Mitchell index was due to the following causes.

Mitchell gave inadequate weight—only 5.6 percent of family expenditures—to clothing, which, though rising more in price than

<sup>5</sup> Hoover, *op.cit.*, p. 50.

<sup>6</sup> 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*, Vermont Agricultural Experiment Station, Bulletin 507, February 1944.

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any other group during the Civil War, declined so rapidly afterward that its price was lower in 1880 than twenty years earlier. He gave excessively large weight (28.7 percent of expenditure) to rent, which, rising less than other prices during the Civil War, continued high thereafter and had an upward trend for the whole twenty-year period. This maldistribution of weights occurred because Mitchell allowed items in certain clothing, food, and "other" groups for which he had no price data to fluctuate in accordance with all prices. The effect was to raise the weight of food from 42.5 percent of family expenditure, as reported from a study of 2,567 families in 1901, to 56.7 percent. This weight for food was much too high for 1901, but it was close to the percentage actually spent in 1875 according to the Massachusetts study which Miss Hoover relied on.<sup>7</sup>

Mitchell's redistribution of weights did no apparent harm so far as food was concerned, but its effect on clothing, rent, and "other items" was such as to bias his index upward somewhat. If Miss Hoover's prices for her major groups were reweighted by the expenditure distribution used by Mitchell, her cost-of-living relative in 1880 would be 113 instead of 110.

Most of the upward bias in Mitchell's index was imparted by his averaging relatives of prices of the same commodity in different localities, instead of averaging actual prices, as Miss Hoover did. This bias may be revealed by a very simple illustration. Let the average price of butter in Philadelphia, say, rise from 20 cents a pound in 1860 to 29 cents in 1880; at the same time let it fall in Lawrence, Indiana, from 30 cents in 1860 to 20 cents in 1880. A simple average of actual retail prices in the two communities would yield a *decline* from 25 cents in 1860 to 24.5 cents in 1880 or 2 percent. But a simple average of relatives would yield a price *rise* of 6 percent:

	1860		1880	
	Price	Relative	Price	Relative
Philadelphia	0.20	100	0.29	145
Lawrence	0.30	100	0.20	67
Average of prices	0.25	100	0.245	98
Average of relatives		100		106

When relatives are averaged for items of similar absolute size, of which some decline and others rise, there will be an upward bias.

<sup>7</sup> Engel's law, which was widely quoted in the late nineteenth century in state labor bureau documents, suggested that poorer families spend larger proportions of their incomes on food.

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If the increases and decreases are only a few percent, the bias will be negligible. If they are very large, relative to differences in absolute size of the various items, the bias can be enormous. As Mitchell himself observed, the variation of prices of the same commodity among different localities was much greater in 1860 than in 1880.<sup>8</sup> The most extreme change occurred in Cedar Rapids, Iowa, where the prices reported for many commodities in 1860 were low relative to those in other communities in that year and where they rose by very large percentages to 1880—for some commodities by percentages in the hundreds. In order to determine the influence of the extreme Cedar Rapids prices, this writer examined the retail price indexes for the 58 commodities used by Mitchell (excluding the two board items). Of the 43 commodities for which Mitchell's 1880 price relatives were above Miss Hoover's, 25 included Cedar Rapids prices. Of the 15 commodities in which Mitchell's prices were the same or lower than Miss Hoover's, 11 did not include Cedar Rapids. In a large percentage of the first set of cases, the exclusion of Cedar Rapids from the Mitchell average brought the relative price of the commodity in 1880 closer to Miss Hoover's result; in a substantial proportion of these cases the discrepancy was largely eliminated.

It may be concluded that the principal reasons Miss Hoover obtained lower relative prices than Mitchell did are that (1) by averaging the actual prices of each commodity in different cities, she avoided the statistical bias caused by averaging relatives, and (2) by using price data for a much larger number of cities and towns than Mitchell did, she absorbed the accidental impact of a few communities—Cedar Rapids, New Cumberland, West Virginia, and Springfield, Ohio—which had relatively great net price increases during the twenty-year period.

### THIS STUDY'S INDEX FOR 1880-90

This study's consumer price index for the 1880's differs markedly from that of Burgess, the only other one for this decade; whereas the Burgess index included only food, the present one includes food, shelter, fuel and light, clothing, house furnishings, and miscellaneous items.

The retail price data for these items are extremely thin and derive from a wide variety of sources. For many of the series on food, fuel, clothing, and house-furnishing items, retail prices were quoted

<sup>8</sup> Mitchell, *Gold, Prices, and Wages*. Mitchell was aware of the bias involved in constructing index numbers by simple arithmetic averages of relatives (see *ibid.*, p. 58). He therefore based much of his own analysis on medians of relatives, as well as on deciles that showed the entire distribution.



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for each year 1880-90 by a small number of retail stores in New York City and Brooklyn, and two localities in Pennsylvania.<sup>9</sup>

In addition, annual prices were taken from T. M. Adams' original collection of prices paid by Vermont farmers for articles of food, clothing, fuel and light, as well as for miscellaneous items of family expenditure, such as tobacco, fire insurance, railroad passenger travel, and physician's services.<sup>10</sup> Retail price data in scattered years were obtained for a few states, including Iowa, Massachusetts, Ohio, Wisconsin, Missouri, and New Jersey, from a compilation by the Massachusetts Bureau of Statistics of Labor.<sup>11</sup> These data were especially spotty for the 1880's and their main contribution was a better bench mark for meats, wood, and a few clothing items. Data were most often available for only 1880 and 1885. For 1890 quotations for items answering similar description as to quality-grade had usually to be obtained from the extensive studies by the United States Department of Labor for that year and published in reports of the Aldrich Committee and of the Department of Labor itself.<sup>12</sup> Rents for four-room and six-room houses were obtained for each of three places: Leavenworth, Kansas, for 1880 and 1889, and Boston and St. Louis, for 1880 and 1890. Rents for 1880 were from the Weeks Report on retail prices;<sup>13</sup> those for 1889 and 1890 were from state reports.<sup>14</sup> Some rentals were based on sketchy reports, others on extensive returns, as in the case of Massachusetts.

<sup>9</sup> *Tenth Annual Report of the Bureau of Statistics of Labor of the State of New York* (for 1892), Part I, pp. 277-284; *Annual Report of the Secretary of Internal Affairs of the Commonwealth of Pennsylvania* (for 1890), Part III, "Industrial Statistics," Vol. xviii, pp. A-44 to -47. The New York stores, except for one whose prices were quoted for January and another whose prices were quoted for September, did not specify the time of year to which the prices referred. The Pennsylvania stores quoted their prices for four months each year—January, April, July, and October. These four months were combined into a year's average in the present study.

<sup>10</sup> T. M. Adams, *op.cit.*, Bulletin 507 Supplement, pp. 41-66.

<sup>11</sup> *Thirty-first Annual Report of the Massachusetts Bureau of Statistics of Labor*, Public Document No. 15, March 1901.

<sup>12</sup> Nelson W. Aldrich, *Retail Prices and Wages*, Report by Mr. Aldrich from the Committee on Finance, July 19, 1892, 52nd Congress, 1st Session, Senate Report 986, Parts I and III.

<sup>13</sup> *Eighteenth Annual Report of the Commissioner of Labor* (for 1903), *Cost of Living and Retail Prices of Food*, Part II, Table I.

<sup>14</sup> Pp. 104-107.

<sup>14</sup> For Leavenworth, 1889: *Seventh Annual Report*, Kansas Bureau of Labor Statistics, p. 198. Computed on a per-room basis from rent expenditures where the number of rooms was stated.

For Boston, 1890: *Twenty-second Annual Report of the Massachusetts Bureau of Statistics of Labor*, March 1892, pp. 481, 491. Weighted average rents paid by 18,661 Boston families occupying four-room houses, and 7,965 occupying six-room houses; several thousand higher-bracket rents were excluded.

For St. Louis, 1890: *Twelfth Annual Report* . . . Missouri Bureau of Labor Statistics, for the Year Ending November 5, 1890, "Family budgets," pp. 414-515.

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In Massachusetts, comparisons of 1885 with 1880 and 1890 could be obtained from the *Thirty-first Annual Report*. This 1885 comparison was the sole basis for our assumption that United States rents during the 1880's could be interpolated linearly between 1880 and 1890. Prices of daily newspapers in eight cities were obtained from newspaper files at the Library of Congress.<sup>15</sup> Postage on first-class letters was obtained from a Post Office publication.<sup>16</sup>

These prices were compiled into the consumer price index in three steps.

First, the prices of the same commodity in different localities in each year were averaged together. Wherever the quality or grade was reasonably similar, actual prices were averaged to obtain the mean price for the United States—thus minimizing the bias described in connection with Mitchell's method. Wherever the items differed—for example, Rio green coffee and Rio roasted coffee—each year's price was first expressed as a relative of 1880 and these relatives were then averaged. Possibility of bias thus persisted, but since the average prices of commodities did not fluctuate anything like as widely as prices for the same commodity in different stores or localities, the bias was much reduced. This study follows the Mitchell and Hoover practice of not weighting the prices of the same commodity in different stores or localities, on the ground that there was no information on the relative expenditures at these different prices.

The second step was to combine the prices of the various commodities into an average for the major group: for example, eggs, butter, milk, and lard, within the food group. This was done by converting each price series into relatives on the basis of 1880 = 100, then weighting each relative by the importance of the commodity in the group. Eggs, for example, were assigned a weight of about 3.75 percent of food expenditure. These weights, following Hoover and Mitchell, were taken from the expenditures of 232 families as reported by the Aldrich Committee.<sup>17</sup>

The third step was to combine the major groups—food, rent, fuel

<sup>15</sup> I am indebted to my son, Clarence D. Long, III, for this compilation. The eight cities are Baltimore, Boston, Hartford, New York, Philadelphia, Chicago, Charleston, and Memphis. They were chosen as closely as possible in accordance with the list compiled by Miss Hoover, but some changes were forced by the fact that certain newspapers used by her in earlier years had discontinued in the 1880's.

<sup>16</sup> *United States Domestic Postage Rates, 1789-1956*, Post Office Department, Publication 15, pp. 22-23.

<sup>17</sup> *Retail Prices and Wages*, Senate Report 986, Part 1, p. XLII. The weights assigned here, however, differ from those assigned by Miss Hoover because her weights were readjusted for changes in prices between 1860 and 1890. They differ somewhat from those given in the Aldrich Report because the weights assigned there to items for which we have no price data were redistributed among the items for which we do have price data.

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and light, clothing, house furnishings and miscellaneous—into the final consumer price index. The major groups were given the following percentage weights based on the expenditures of 2,567 United States families in 1901: food 42.5; rent 13.0; fuel and light 5.3; clothing 14.0; furniture and utensils 3.4; and miscellaneous 21.8.<sup>18</sup> This distribution assigned less weight to food, fuel and light, and rent, and more to miscellaneous items than was assigned by Miss Hoover. It also attached different weights than Mitchell, who relied on the same expenditure study but redistributed the expenditures for which he had no price series in such a way as to give more weight to food, fuel, and rent and much less to clothing and miscellaneous items. The distribution of weights in the present study seems closer to the expenditure patterns of the 1880's than to those of the earlier period, as might be expected in view of the fact that rising real incomes allow families to spend more on luxury and semiluxury items. The smaller proportion of expenditures on food seems to be generally borne out by the percentage distributions obtained in the following studies of expenditures in various states in the 1880's:

	<i>Massachusetts</i>	<i>Illinois</i>	<i>St. Louis</i>	<i>Kansas</i>		<i>Mean</i>	<i>United States (2,567 families) 1901</i>
	1883	1884	1890	1886	1890		
Food	49.28	41.38	38.16	47.4	42.88	43.8	42.5
Rent	19.74	17.42	15.38	18.3	16.63	17.5	13.0
Fuel and light	4.30	5.63	"	"	"	-	5.3
Clothing	15.85	21.00	18.65	16.6	13.62	17.2	14.0
Miscellaneous	10.73	14.57	27.81	17.9	26.87	21.5	25.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

<sup>a</sup> Fuel and light were probably included in miscellaneous.

State expenditure data: *Second Annual Report of the [Kansas] Bureau of Labor and Industrial Statistics*, January 1, 1887, p. 306; *Fifteenth Annual Report*, Massachusetts Bureau of Statistics of Labor, July 1884, p. 465.

United States: *Eighteenth Annual Report of the Commissioner of Labor*, p. 6480.

However, the state distributions seem to assign greater relative importance to rent and clothing.

The new consumer price index suggests a net decline in living costs during 1880-90 of about 11 percent, much more than the 3 percent manifested by the Burgess index. All of the decline occurred during 1883-86. All the major groups dropped, with clothing and "other" items falling the most, rents the least, and food about the same as the all-items index. The all-items index thus moved very similarly with food, as it did in Miss Hoover's indexes for the two previous

<sup>18</sup> *Eighteenth Annual Report of the Commissioner of Labor*, p. 648.

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decades, despite the fact that food prices were given much less weight in this third decade.

When linked to the Hoover index, the result is a new series of consumer prices for 1860-90 which behaves very differently from the series of the Federal Reserve Board prepared by linking the Mitchell and the Burgess indexes (Table 17). If reliable, it shows that, except for a couple of Civil War years, living costs were lower, in relation to 1860, throughout the entire thirty years than previously suggested. The gap was small at the close of the Civil War; thereafter living costs fell much more rapidly to 1870. The gap gradually widened to 1885, then opened still wider in the last five years. As a result, 1890 living costs were 2 percent below—instead of 24 percent above—the level of thirty years before. The cost of living measured by the new index of living cost was relatively somewhat higher in 1890 than if it had been measured, as by Falkner and Hansen, in wholesale prices. It also manifested much less rise during the Civil War and less decline during the 1870's.

How accurately this new index measures the cost of living is probably impossible to say. It rests on more data and is less subject to bias than the Mitchell-Burgess index, and it is surely more representative than a wholesale price index for adjusting wages of working people. But it is undoubtedly inferior to modern indexes, and could surely be improved by an exhaustive examination of newspaper advertisements, store catalogues, and business and family records.

TABLE 17  
Indexes of Cost of Living, Country-Wide, 1860-1890  
(1860 = 100)

	1860	1865	1870	1875	1880	1885	1890
New index (Hoover-Long)	100	176	141	123	110	103	98
Mitchell <sup>a</sup> -Burgess	100	179	156	138	128	119	124
Burgess <sup>b</sup> (food)	100	172	147	129	111	103	107
Falkner <sup>c</sup> (also used by Hansen)	100	232	144	129	105	93	94

Source: This study, Appendix Tables B-1 and -2; Mitchell, *Gold, Prices, and Wages*, p. 91; Aldrich Report, Vol. 3, Part 1, p. 93; W. R. Burgess, *Trends of School Costs*, Russell Sage Foundation, 1920, p. 54.

<sup>a</sup> The Mitchell index is the mean of retail prices of necessities drawn from the Weeks Report and weighted according to importance in working class family expenditure as surveyed by the Department of Labor around 1900. See text.

<sup>b</sup> The Burgess index is the weighted mean of retail prices of ten articles of basic food (beef, pork, poultry, butter, eggs, milk, flour, sugar, lard, potatoes); weighted in accordance with the same family budget used by Mitchell.

<sup>c</sup> The Falkner index is based on the mean of wholesale prices drawn from the Aldrich Report and weighted in accordance with the same family budget study used by Mitchell.

Mitchell also computed separate indexes for eastern and western states. These behaved similarly, except that the eastern index rose somewhat less during the Civil War and fell somewhat more thereafter. Regional differences in retail-price fluctuations doubtless existed, and were possibly greater in the earlier decades, but the wide variations in retail prices of different qualities of the goods at different stores make it difficult to measure the price trends for the different regions with the sparse data at hand. We therefore present only one retail price index for the whole nation during this thirty-year period.

### *Real Wages in Manufacturing and Building*

Real wages, if the Mitchell-Burgess cost-of-living index were used, would show an increase of about 20 percent from 1860 to 1890. The results of using the new consumer price index are dramatically different, for the thirty-year net rise in real wages was roughly the same as the rise in money wages—about 50 percent (Chart 1).

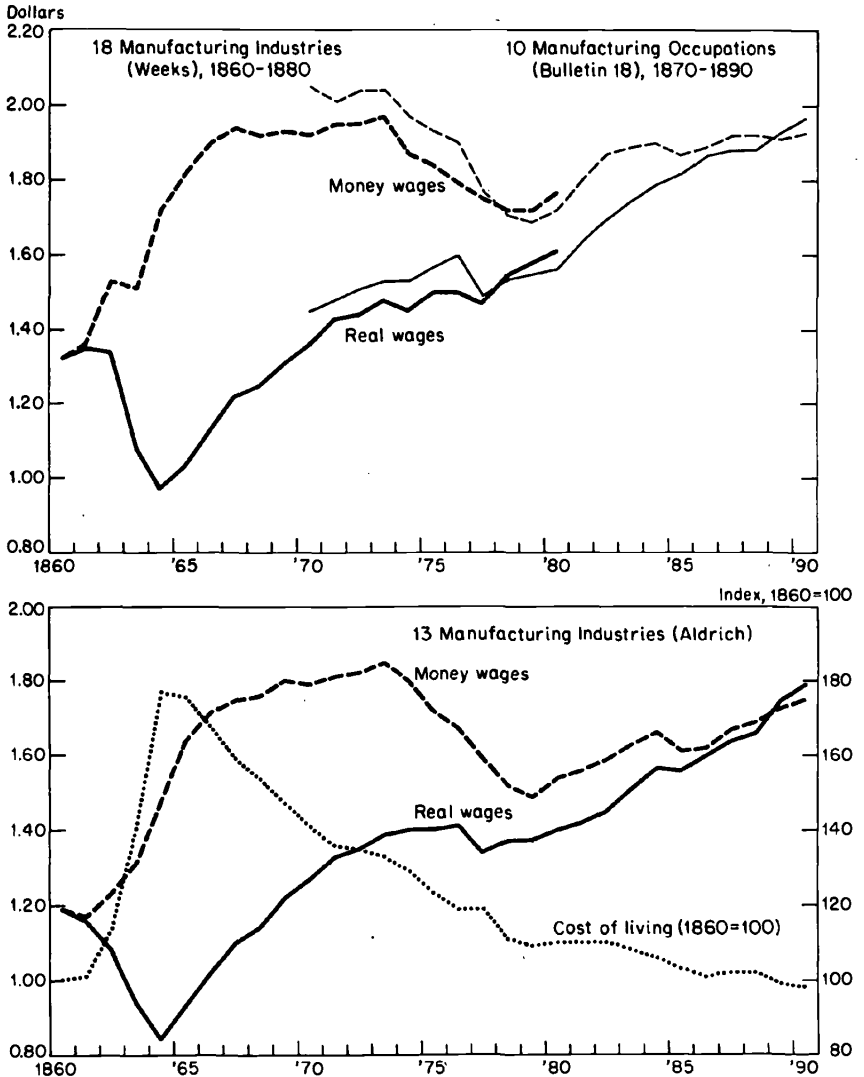
Real wages rose in every one of the three decades, but very unevenly. The Civil War inflation was such that real wages in 1870 were still only 3-7 percent above 1860—though the level of money wages in 1870 was almost at its peak for the next twenty years. During the 1870's, the cost of living fell greatly but a decline in money wages kept close pace, so that by 1880 real wages had gained only an additional 10-19 percent. Most of the over-all gain occurred in the third decade, when a substantial increase in money wages combined with a substantial decrease in the cost of living to give a real-wage increase of 25-28 percent for the ten-year period—more than in the previous two decades combined. The progress of real wages was still more uneven when observed over shorter intervals. During most of the Civil War, living costs outstripped money wages; the result was that in 1864 real wages were less than three-fourths their 1860 level. In every one of the nine post-Civil War years, living costs fell while money wages rose, with the result that by 1869 real wages had erased their war declines and by 1873 had reached a level 17 percent above 1860. After 1873 money wages reversed their trend and declined, but living costs continued their rapid drop to 1879, so that, in the Aldrich data, real wages declined in only one year—1877—and then by only 5 percent. Thereafter, real wages rose in two waves—1878-84 and 1886-90, interrupted by only an insignificant dip of 1 percent. In both waves money wages rose while prices fell, but the first wave of increase was due mainly to a decline in living costs, the second mainly to a rise in money wages.

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We now compare changes in real wages found in this study with those found by Falkner, Hansen, Phelps Brown and Hopkins, and Wesley Mitchell (Table 18). All these investigators use Aldrich data,

### CHART I

#### Daily Money and Real Wages in Manufacturing, Annually, 1860-1890



Source: Appendix Table A-10.

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which cover only the eastern states, except that Mitchell also uses Weeks Report data which represent eastern and western states as well as a few southern states for a few industries.

Wide differences in the increase of real wages show up in the comparisons for the thirty-year period: the largest increase—nearly 80 percent—is shown by Falkner; the next to largest—nearly 70

TABLE 18

Index of Real Daily Wages in Manufacturing in the East, Based on Aldrich Wage Data and Hoover-Long Consumer Price Index; Compared with Indexes for Mixed Industries Computed by Other Investigators from Aldrich Data and Various Price Indexes: 1860-1890

	1860	1865	1870	1875	1880	1885	1890
Long: Manufacturing <sup>a</sup>	100	78	107	118	118	131	150
Mitchell: Median <sup>b</sup>	100	90	120	116	105	n.c.	n.c.
Mean <sup>c</sup>	100	86	115	120	112	n.c.	n.c.
Falkner <sup>d</sup>	100	64	116	123	136	167	180
Hansen <sup>e</sup>	100	67	125	128	135	160	168
Phelps Brown <sup>f</sup>	100	97	114	121	118	141	132

n.c. Not computed.

Sources and explanation: This study, Chapter 2 and Appendix Table A-1; Mitchell: *Gold, Prices, and Wages*, pp. 86, 89, 91, 169-170, 173-74, 204-206; Falkner, *Aldrich Report*, Vol. 3, Part 1, pp. 93, 176; A. H. Hansen, "Factors Affecting the Trend of Real Wages," *The American Economic Review*, Vol. xv, 1925, p. 32; E. H. Phelps Brown with Sheila V. Hopkins, "The Course of Wage-Rates in Five Countries, 1860-1939," *Oxford Economic Papers*, New Series, Vol. 2, June 1950, p. 277.

<sup>a</sup> Weighted mean of daily wages in 13 manufacturing industries in eastern states, deflated by Ethel D. Hoover's index of weighted mean of retail prices for 1860-80 and a new index of retail prices for 1880-90 prepared in this study. Appendix Tables B-1 and -2.

<sup>b</sup> Weighted median of relative wages in 21 miscellaneous industries including building, city public works, railroads and stores. Weighted median of relatives of retail prices of cost-of-living items.

<sup>c</sup> Weighted mean of relative wages in 21 miscellaneous industries. Weighted mean of retail prices.

<sup>d</sup> Mean of relative wages in 21 miscellaneous industries weighted on the industry level by census reported employment; mean of relative *wholesale* prices weighted by importance in family expenditures.

<sup>e</sup> Mitchell's weighted mean of relative wages from Aldrich data for 1860-80; Falkner's simple mean from Aldrich data for 1880-90. Falkner mean of relative wholesale prices weighted by importance in family expenditures.

<sup>f</sup> Wage index constructed from Aldrich data by weighting the relatives of occupational wages by employment in those occupations in 1870-79, then weighting the average wage of each industry by the census-reported employment in 1870. It is therefore a fixed weight index. Cost-of-living index is Mitchell's median of relative retail prices for eastern states and a "combination of indexes of cost of living and rents (Carl Snyder, *Business Cycles and Business Measurements*, 1927) for 1881-1890 based on the Russell Sage Foundation estimates."

percent—by Hansen; and the smallest—around 30 percent—by Phelps Brown. The 50 percent increase found by this study thus lies about midway. For 1860-80, also, this study shows a larger increase—18 percent—than Mitchell's mean-wage series or his median-wage series. Why these marked differences?

In the case of the Falkner, Hansen, and Mitchell indexes, money wages rose more sharply principally because these analysts included a miscellany of nonmanufacturing industries—building, stores, city public works, and railroads—which have considerable weight in the index and which, on average, experienced relatively more increase in wages;<sup>19</sup> and because they averaged relative instead of dollar wages, thereby imparting an upward bias to the money wage index.

In the Hansen and Falkner investigations, the greater rise in real wages between 1860 and 1890 is also due in part to deflation in wholesale prices. Wholesale prices were more sensitive in the short run, rising more during the Civil War and falling more in the 1870's; but their trend over the whole period was somewhat more downward than that of retail prices. If the new consumer price index derived in this study had been used by Hansen and Falkner, their index of real wages, instead of rising 68 and 79 percent respectively, would have risen 61 and 71 percent. This rise, however, was still substantially greater than that of my index. Most of their greater rise in real wages is due to money wages.

In the Phelps Brown and Hopkins index, the smaller real-wage increase was due entirely to the Mitchell-Burgess cost-of-living index, rejected in this study as being strongly biased upward. Their money-wage rise is as strongly biased upward as those of the other investigations.

The Mitchell indexes based on Aldrich data were not adjusted for living cost during 1880-90 and do not offer a comparison for real wages beyond 1880. Until that year Mitchell's money-wage index was biased upward by his inclusion of nonmanufacturing wages and by his method; but his cost-of-living index was also biased for reasons already set forth.

Further comparison reveals a larger net advance in real wages up to 1880 than appears in Mitchell's series based on Weeks data (Table 19), despite his use of more industries and his construction of the index by simple medians of relative wages instead of weighted

<sup>19</sup> For these industries only a small number of firms reported to the Aldrich Committee; including them would merely prevent the construction of a wage index representative of manufacturing without allowing the construction of one that is representative of all industry or even of the industries covered.



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TABLE 19

Indexes of Real Wages in Manufacturing, Based on Weeks-Bulletin 18 Wage Data and Hoover-Long Consumer Price Index; Compared with Indexes Computed by Mitchell: United States and East and West, 1860-1890

	1860	1865	1870	1875	1880	1885	1890
UNITED STATES							
Long: Mean <sup>a</sup>	100	78	103	114	122	142	154
Mitchell: Median <sup>b</sup>	100	83	103	103	105	n.c.	n.c.
EAST							
Long: Mean <sup>a</sup>	100	79	106	118	124	149	160
Mitchell: Median <sup>b</sup>	100	79	105	106	105	n.c.	n.c.
WEST							
Long: Mean <sup>a</sup>	100	78	99	109	120	133	144
Mitchell: Median <sup>b</sup>	100	89	100	100	102	n.c.	n.c.

n.c. Not computed.

Source and explanations: Chapter 2; Appendix Tables A-3, -4, and -10. Mitchell, *Gold, Prices, and Wages*, pp. 86, 177, 192-193.

<sup>a</sup> Wage index computed by averaging dollar wages of manufacturing industries taken from Weeks Report and Bulletin 18 and weighted at the state and industry levels by census-reported employment; Hoover-Long cost-of-living index. See Appendix B.

<sup>b</sup> Wage index constructed from Weeks Report by computing simple medians of relative wages in manufacturing industries. Cost-of-living index constructed by computing medians of relative retail prices of 35 commodities for 1860-80, weighted by importance in family expenditures. Mitchell constructed separate indexes of living cost in the East and West, but since the retail price data are not believed good enough to justify separate indexes, the eastern and western wages are both adjusted by means of the retail price index for the United States.

TABLE 20

Indexes of Real Wages in Building, Based on Aldrich Report and Bulletin 18 Data and on Hoover-Long Consumer Price Index: United States, and East, West, and South, 1860-1890

	1860	1865	1870	1875	1880	1885	1890
ALDRICH DATA							
1860=100	100	86	128	129	115	147	162
1870=100	78	67	100	101	90	115	127
BULLETIN 18 DATA							
United States	n.a.	n.a.	100	107	110	133	141
East	n.a.	n.a.	100	107	110	134	145
West	n.a.	n.a.	100	108	112	135	138
South	n.a.	n.a.	100	111	109	127	131

n.a. Not available.

Source: Wage data, Appendix Tables A-1 and -4; cost of living, Tables B-1 and -2.

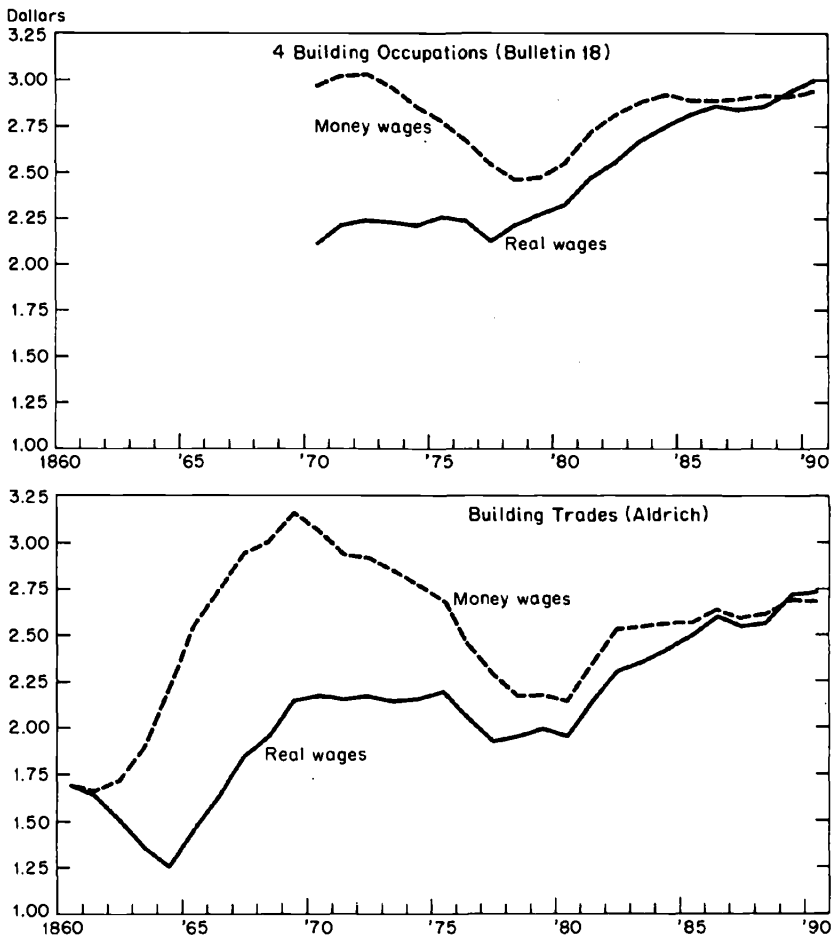
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means of dollar wages. His money-wage index rose more than nine both to 1870 and from 1860 to 1880, but his cost-of-living index rose nearly as much as his wage index and thus prevented more than a few percent rise in real wages.

This study's estimate of building wages covering the entire thirty years is based on Aldrich data, which embrace only the states east of Ohio. The Aldrich index makes a net advance of 62 percent (Table 20 and Chart 2), greater than the 50 percent for manufacturing

### CHART 2

#### Daily Money and Real Wages in Building, Annually, 1860-1890

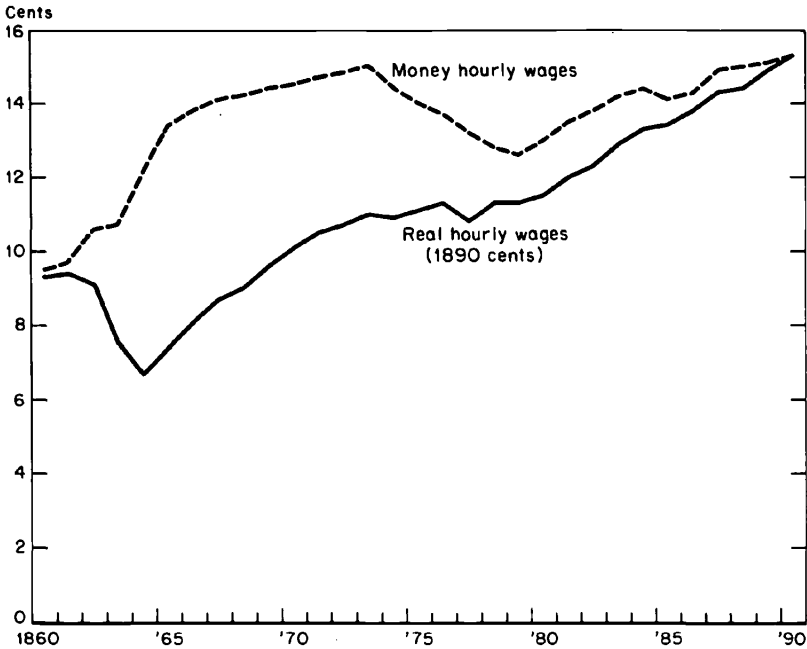


Source: Appendix Table A-10.

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CHART 3

Hourly Money and Real Wages in Manufacturing, Annually, 1860-1890



Source and explanation: Appendix Table A-11.

but well below the 84 percent for real wages in building, computed by Falkner. The difference is due partly to my cost-of-living index based on retail instead of wholesale prices, and mainly to the method of computing the money-wage index. Real wages in building declined less than those in manufacturing during the Civil War years, but fell substantially from 1875 to 1880. As with real wages in manufacturing, most of the rise occurred in last decade of the 1880's.

My other measure of building wages, based on Bulletin 18 of the Department of Labor, has some representation in all major regions—East, West, and South—but the series does not begin until 1870. Real wages rise much more by 1890 than those based on Aldrich data, in both the United States as a whole and in the eastern states. Since the living-cost index is the same, my two series for real wages in building differ entirely with respect to money wages. Money wages based on Bulletin 18 data declined only slightly between 1870 and 1890, and even rose in the East whereas the Aldrich building wages declined substantially. This difference may be due

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to geographical and occupational coverage, since the Bulletin 18 index rests on only four skilled building occupations in large cities.

### *Real Annual Earnings for Decennial Years*

Average annual earnings adjusted for changes in living cost rose about 46 percent between 1860 and 1890 (Table 21)—again close to the 50 percent rise for real daily wages—as expected from the similar behavior of money wages and earnings.<sup>20</sup> But the failure of earnings to rise as much as wages in money terms by 1870 or 1880 meant that real earnings also manifested less progress. Higher living cost, in combination with probably fewer average days of employment, caused real annual earnings to be lower in 1870 by about 10 percent. By 1880 they were above 1860 by only 6 percent, compared to 18 percent for real daily wages. While two-thirds of the net rise in real daily wages occurred in the 1880's, nearly nine-tenths of the rise in real annual earnings seems to have occurred in that decade. It is possible, however, that if the censuses had been held one or two years earlier or later, the results would have suggested more even progress in annual earnings during the thirty-year period. Again, the data for construction were of such dubious validity that we make no analysis of the real annual earnings in this industry.

TABLE 21  
Real Average Annual Earnings in Manufacturing, 1860-1890

	1860	1870	1880	1890
Money annual earnings (dollars)	297	384	345	427
Consumer price index	100	144	109.5	98.5
Real annual earnings: 1860 dollars	297	267	315	434
INDEXES: 1860 = 100				
Real annual earnings	100	90	106	146
Real daily wages (Aldrich data)	100	107	118	150
Real daily wages (Weeks-Bulletin 18)	100	103	122	154

Earnings data are for years ending May 31; see text note 20.  
Source: Appendix Tables A-9, B-1 and B-2; Tables 18 and 19.

<sup>20</sup> It should be kept in mind that the annual earnings cover the twelve months ending May 31 of each decennial year; consumer prices in some cases refer to the average for the calendar year, in some cases to June 1st, and in others to unknown dates. Therefore average annual earnings are adjusted in Table 21 to an average for living costs in 1859-60, 1869-70, 1879-80, and 1889-90. However, differences in results from deflating by means of living cost in the years 1860, 1870, 1880, and 1890 would have been small except possibly in 1870.