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Retail Prices after 1850

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MEASUREMENTS of price changes during the nineteenth century have been needed for many purposes, especially for studies of business cycles and purchasing power. However, most attempts to determine relationships between price changes and other variables revealed wide gaps in the available price data. Differences in commodity coverage, methods of calculation, and the adequacy of prices and weights affected the timing and amplitude of the changes recorded.

Valuable additions to our knowledge of this period have been developed through individual or group research in surviving price records. The reservoir of price statistics now available for the development of annual estimates of national income back to 1800 has been reviewed and summarized elsewhere by the author.[1]

The most serious inadequacies are the sparseness of measures at the retail level and the lack of coverage of manufactured products at both wholesale and retail. This paper adds to the available evidence on retail price movements by presenting consumer price indexes for 1851 to 1880, with fairly crude estimates for the next ten years, to provide a link with similar indexes from 1890 to date. Improvements to the estimates will undoubtedly be made sometime in the future; but, for the present, the quantity and quality of the basic price and weighting data impose limitations on precision that cannot be removed by refinements in calculation techniques. A description of the materials and methods used to obtain summary figures is presented below along with a comparison of the index with earlier estimates.

Consumer Price Indexes, 1851–1880

Consumer price indexes were computed for the years 1851 to 1880, utilizing most of the retail price data available and employing currently

[1] Sources of prices and weights, methods employed for averaging, and other details provided by investigators, along with some comments on probable validity, are presented in Ethel D. Hoover, "Wholesale and Retail Prices in the Nineteenth Century," in the September 1958 issue of the *Journal of Economic History*. This article was originally presented to the conference as part of the discussion on price changes in the nineteenth century.

Note: The consumer price indexes presented in this paper are not to be considered official indexes of the Bureau of Labor Statistics. The author wishes to express her appreciation to the BLS for the assistance of Mrs. Margaret W. Smith and others in the tabulating and computing stages and to Dr. Dorothy S. Brady for her helpful suggestions.

accepted calculation techniques. These indexes for all items, for major groups, and for special groups are presented in Tables 1 and 2. Chart 1 shows the movement of selected major groups compared with the all items index.

There were few major changes in retail prices between 1851 and 1860. Foods, and fuel and light increased moderately, probably reflecting the demand for food for Europe during the Crimean War, the gold discoveries in California, and a building boom which tapered off by the mid-fifties. The financial difficulties of 1857 brought only minor price adjustments.

TABLE 1

Consumer Price Indexes for the United States, by Major Group, 1851–1880
(1860 = 100)

Year	All Items	Food	Clothing	Rent	Fuel and Light	Other
1851	92	86	100	100	99	95
1852	93	87	101	100	99	95
1853	93	88	100	100	102	95
1854	101	100	100	102	113	96
1855	104	105	99	103	109	97
1856	102	102	100	103	106	96
1857	105	108	100	100	109	98
1858	99	99	99	100	103	98
1859	100	102	98	100	98	99
1860	100	100	100	100	100	100
1861	101	99	110	95	103	102
1862	113	107	143	101	112	105
1863	139	129	197	113	136	115
1864	176	167	261	130	155	141
1865	175	170	238	134	159	147
1866	167	169	194	138	152	146
1867	157	163	166	135	140	144
1868	154	164	148	138	133	144
1869	147	151	148	141	132	145
1870	141	143	141	142	126	143
1871	135	137	128	144	125	142
1872	135	136	126	144	122	141
1873	133	136	122	139	120	142
1874	129	134	115	133	114	141
1875	123	129	105	129	110	140
1876	119	124	104	123	106	138
1877	118	125	99	123	98	138
1878	111	113	95	124	93	135
1879	108	110	94	122	92	134
1880	110	111	94	127	95	133

Price indexes for the individual commodities and services included in these summary figures are given in Appendix A. The sources of the figures in this and the following tables are described in the text and the text footnotes.

TABLE 2

Consumer Price Indexes for the United States, by Special Group, 1851–1880
(1860 = 100)

Year	*All Items*	*All Items Less Food*	*All Items Less Rent*	*All Items Less Food and Rent*
1851	92	99	90	99
1852	93	100	91	100
1853	93	100	92	100
1854	101	103	101	103
1855	104	102	104	102
1856	102	102	102	101
1857	105	102	106	102
1858	99	100	99	100
1859	100	99	101	98
1860	100	100	100	100
1861	101	103	102	107
1862	113	120	115	131
1863	139	151	144	173
1864	176	187	185	222
1865	175	181	183	209
1866	167	163	172	178
1867	157	149	161	157
1868	154	141	157	143
1869	147	141	148	141
1870	141	137	141	135
1871	135	133	134	127
1872	135	132	133	125
1873	133	128	131	122
1874	129	122	128	116
1875	123	116	122	108
1876	119	113	118	106
1877	118	109	117	101
1878	111	107	108	96
1879	108	105	105	95
1880	110	108	106	96

The rapid inflation during the Civil War and the protracted decline thereafter affected all the major groups. Clothing prices reached a peak in 1864, at a level 161 per cent higher than in 1860, but declined sharply the following year. Retail clothing prices showed slightly more rise than prices of textile products at wholesale, probably because of shortages of shoes and dry goods for civilians (or inadequacies in the data). The peak levels for all other groups except rents were reached in 1865. Rents continued rising until 1872 when they too joined the general decline. Rents and the "other" group (made up primarily of medical care and newspapers) exhibited the slower upward and downward movements

CHART 1

Consumer Prices Indexes for All Items, Food, Clothing, Rent, and Fuel and Light, 1851–1880

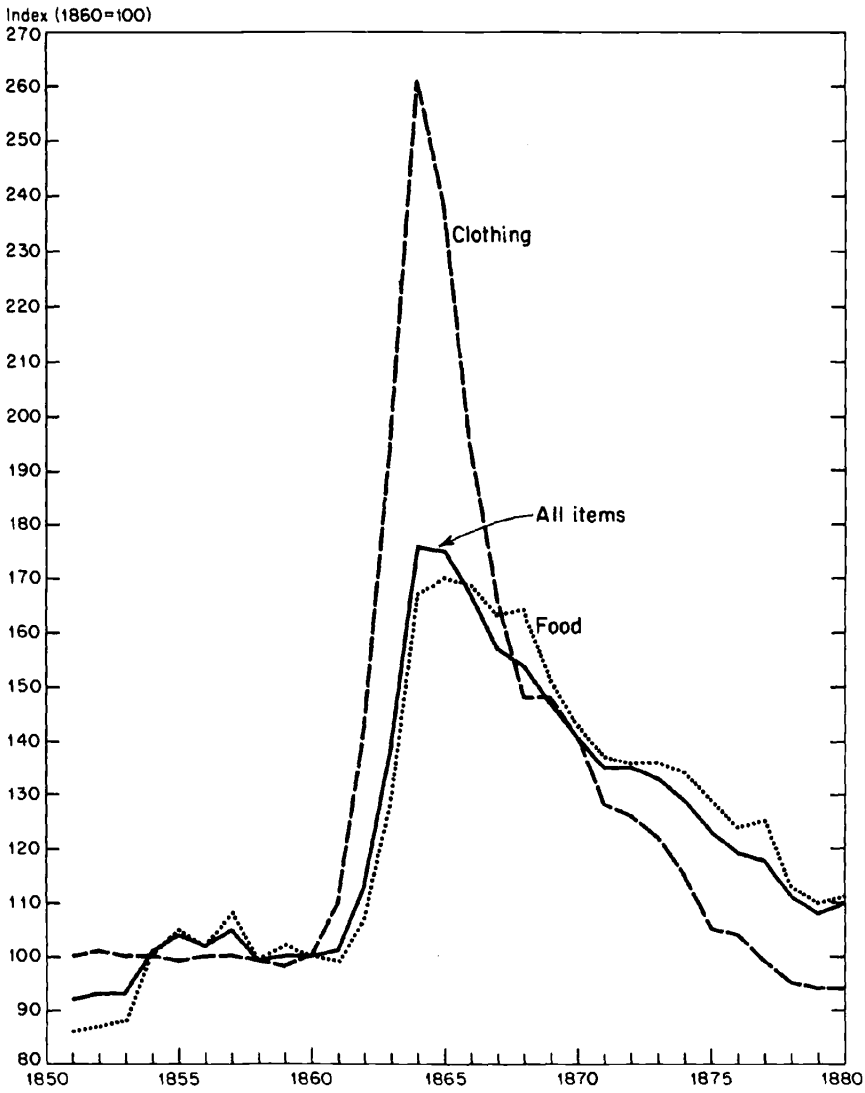
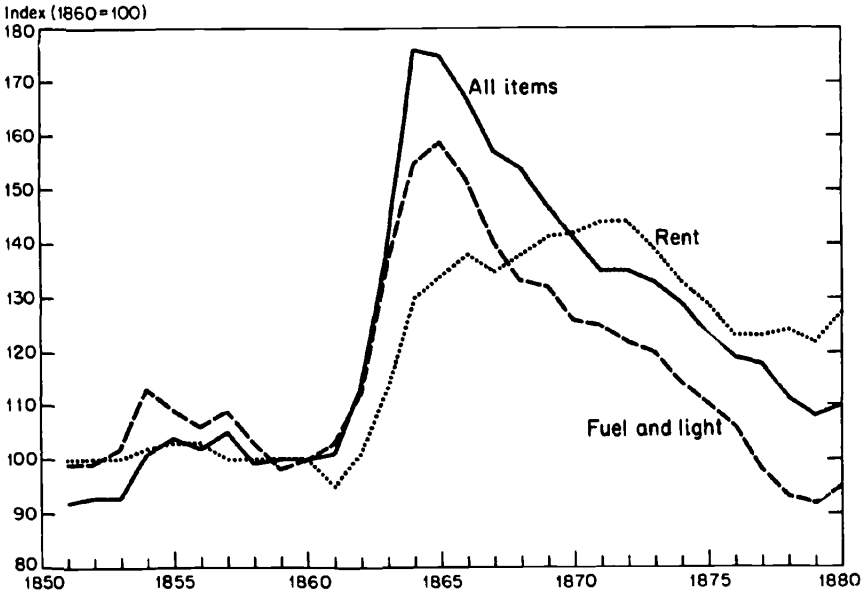


CHART 1 continued



characteristic of these items. The percentage changes by periods for all items and for major groups are shown in Table 3.

TABLE 3

Changes in Consumer Price Indexes, by Major Group, Selected Periods, 1851–1880
(per cent)

Period	*All Items*	*Food*	*Clothing*	*Rent*	*Fuel and Light*	*Other*
1851–55	+13	+22	− 1	+ 3	+10	+ 2
1855–60	− 4	− 5	+ 1	− 3	− 8	+ 3
1860–65	+75	+70	+138	+34	+59	+47
1865–70	−19	−16	− 41	+ 6	−21	− 3
1870–75	−13	−10	− 26	− 9	−13	− 2
1875–80	−11	−14	− 10	− 2	−14	− 5

Sources of Data and Methods of Calculation

SOURCES OF PRICES

Retail price data employed in the construction of these indexes were taken almost entirely from the "Report on the Average Retail Prices of

Necessaries of Life in the United States," usually referred to as the "Weeks Report."[2] This is by far the most extensive compilation of retail prices available for the nineteenth century. Weeks, who directed the preparation of the report, stated that it was to show "to some extent the difference between the nominal wages and the real wages of a laborer so far as the purchasing power of nominal wages is concerned. . . ."[3] Data were collected from one or two respondents in each of more than forty cities in sixteen states. An average price for each year from 1851 to 1880 was requested or, if that were not possible, the price for June 1. Since the descriptions designating the requisite articles were brief (see Appendix B), it is unlikely that the quotations refer to items of the same quality in all stores. However, Weeks commented that "it is fair to presume that in a given tabulation the price of the same quality or grade of each article, as near as is possible, is quoted for the different years, as the report is made by the same person and of the prices at the same shop."[4]

Individual returns were published without summarization. The number of years for which prices were furnished varied considerably from city to city. Data were most complete for the five to ten years immediately preceding the collection date; relatively few of the returns included quotations for every year. The number of articles for which prices were furnished also varied. In each of the main categories (e.g. dry goods, groceries), less than a third of the returns had prices for all of the items specified. About half of the reported prices were identified as year averages. The others either referred to June 1 or were undated.

These data were examined in detail to determine whether there were any serious drawbacks to their use in computing a consumer price index. When attention was directed to the timing and amount of change in year averages as compared with June 1 prices, great internal consistency was found, as illustrated by the following examples. Milk prices were reported by one store in each of twelve cities for 1864 and 1865. There were two increases—one of 2 cents per quart in Norristown, Pennsylvania, where prices were as of June 1; and one of 3 cents per quart in Philadelphia, where prices were annual averages. Decreases of 2 cents per quart were reported for Canton, Ohio (year averages), and for Jersey City, New Jersey (June 1 prices). All other milk prices were unchanged, regardless of city location or date. For potatoes, which showed large price changes from year to year, the combination of all prices reported showed a more reasonable correlation with the prices received by farmers than did averages of "year" prices only when the

[2] In *1880 Census of the United States*, Vol. xx, Joseph D. Weeks, *Report on the Statistics of Wages in Manufacturing Industries, with Supplementary Reports.*

[3] *ibid.*, p. 1.

[4] *ibid.*, p. 2.

lag from the farm to retail store sales was taken into account. Considering the labor necessary to secure annual averages for thirty years, it is likely that retailers reported as annual averages either estimates or figures for one or more representative months.

When the possibility of major quality differences among stores was explored, insofar as this could be determined from price level comparisons, the doubtful cases were far fewer than expected. Arrays of prices showed definite clustering, and when extremes were deleted, the range was not much greater than for a specified quality today. Differences among cities did not appear excessive, in view of the price differentials between large and small cities common before World War II. This review indicated that an average of the prices for each item would provide a better measure of price changes than an average of city relatives, since the former would eliminate the heavy implicit weighting of a large change in one small city. Several examples of the relatively small price differentials among cities, as well as the correspondence of changes in June 1 prices and year averages are given in Appendix C.

The final step in the examination was a review of the size and geographical distribution of cities. Small cities predominated but large cities were adequately represented. However, coverage was generally limited to New England and the North Atlantic and North Central states. The use of city weights to obtain averages was considered an undue refinement, so simple averages of the prices were calculated.[5]

The distribution of items covered by the Weeks Report, by major groups, was as follows:

Group	*Number of Items*
Food	39
Clothing	10[a]
Rents	2[b]
Fuel and light	5
Other	4

[a] Includes dry goods and shoes.

[b] Reported by room size. One report was for 3 rooms, one for 7 rooms: all others were for 4 or 6 rooms.

Family purchases were generally well represented, judging from the sparse expenditure data for the period. The list of "necessaries" is practically identical with similar lists used for cost of living studies in Massachusetts and other areas of the United States.[6] However, services and other "slow movers" were not included. In order to reduce the

[5] The only exception was bituminous coal, for which there were few returns, mostly from large cities. Average prices were computed separately for large and small cities and combined by weighting large cities 25 per cent and small cities 75 per cent.

[6] See particularly Edward Young's study of the cost of living in *Labor in Europe and America*, Treasury Dept., Report of the Bureau of Statistics, 1876. Retail prices for 1867,

possible error arising from these omissions, prices for certain goods and services were estimated from other sources, as follows:

Food

The only important food category not included in the Weeks Report was fruit. Estimates of the changes in retail prices for five fruits were derived from wholesale prices, using the relationship between changes at retail and wholesale for potatoes and beans.[7]

Clothing

Because "store-bought" clothing was not especially important during this period, the list of yard goods and men's boots in the Weeks Report was considered generally adequate except for shoe repairs and some minor representation of ready-made garments after the Civil War. Estimates for shoe repairs and overalls were derived from a study of prices paid by Vermont farmers.[8] The only evidence to support the use of Vermont prices for all localities was a general similarity between the Vermont data and the Weeks data for some commodities that could be compared.

Medical Care

No data for medical care were included in the Weeks Report, and outlays for such services were large enough to warrant attention. Physicians' fees were included in the study of prices paid by Vermont farmers. When the Vermont index was compared with an unpublished medical care index of the Bureau of Labor Statistics for large cities for 1926 to 1940, neither index showed any significant change. Therefore, the Vermont data were considered a reasonable approximation for the period under review.

Newspapers

Contemporary accounts indicate that newspapers and periodicals were a regular and substantial budget item regardless of income level.

1869, and 1874 for this same list of articles were obtained in towns in thirty-seven states and eight territories and published as state, regional, and United States averages (pp. 796–810). A summary report of family expenditures in 1874 is also included.

[7] Wholesale prices for lemons, currants, raisins, prunes, and dried apples, were obtained from *Wholesale Prices in Philadelphia, 1852–1896: Series of Relative Monthly Prices* (by Anne Bezanson, Marjorie C. Denison, Miriam Hussey, and Elsa Klemp, Industrial Research Department, Wharton School of Finance and Commerce, University of Pennsylvania, 1954, pp. 99, 192, 266, 270 and 271) and from *Wholesale Prices, Wages, and Transportation* (Senate Committee on Finance, 52d Cong., 2d sess., S. Rept. 1394, March 3, 1893, Part 2, pp. 81–84), usually referred to as the Aldrich Report; the other Aldrich Report was on retail prices and wages.

[8] T. M. Adams, *Prices Paid by Vermont Farmers for Goods and Services and Received by Them for Farm Products, 1790–1940; Wages of Vermont Farm Labor, 1780–1940, Statistical Supplement*, Vermont Agricultural Experiment Station, Bull. 507, February 1944.

Accordingly, the prices of local newspapers in eight cities were obtained from files in the Library of Congress.[9] Most of the cities were large, but there was considerable consistency in the timing and amount of price change. For example, rates increased during the war and remained at this higher level in all cities except Charleston, South Carolina.

Other

Price changes for furniture and other household equipment were not estimated because of the minor importance of these items in family expenditures.

The only price series included in the Weeks Report not used for the index was "board" for men and women. The expenditure studies for the period do not show a breakdown of this outlay, nor do they indicate whether services such as laundry and light were included. Similarly, the description of the price series does not indicate what is covered by the quotations. Relative prices for "board" were calculated for supplementary information (see Appendix A), but in the summary indexes, it was assumed that costs for the relatively small number of boarding families were represented by the movement of prices for all other items combined.

DERIVATION OF THE WEIGHTS

Family expenditure data for 1851 to 1880 leave much to be desired from the standpoint of weight derivation for an index of retail prices.[10] The largest samples of families and localities were covered in an 1890–91 expenditure study conducted for the Senate Committee on Finance, but comparisons with more limited studies for earlier dates, particularly the seventies and eighties, revealed differences in the distribution of expenditures among major groups as between the two periods. Food expenses, for example, accounted for 50 per cent or more of total expenses in 1875 compared with 41 per cent in 1890–91. In 1893, the New York Bureau of Statistics of Labor surveyed the evolving expenditure pattern and concluded that "In the smallest income in 1891 the percentage for subsistence (food) is sensibly smaller than for the largest income in 1875 and 1884; while for incomes of about the same size the difference is considerable . . . on the other hand, there is a marked increase in the percentage for clothing and especially in those for rent and sundries."[11]

[9] Baltimore, Md.; Boston, Mass.; Charleston, S.C.; Cincinnati, Ohio; Frankfort, Ky.; Hartford, Conn.; New York, N.Y.; and Philadelphia, Pa.

[10] A convenient reference to all the studies that could be considered for this purpose was compiled by Faith M. Williams and Carle C. Zimmerman, *Studies of Family Living in the United States and Other Countries: An Analysis of Material and Method*, Dept. of Agriculture, Misc. Pub. 223, December 1935.

[11] From the tenth annual report of the New York Bureau of Statistics of Labor, as reported in the Williams-Zimmerman bibliography, p. 145.

In order to give appropriate weight to the important food group, it was decided to use the less comprehensive but more contemporary study of expenditures of 397 workingmen's families in Massachusetts in 1875 as a basis for the allocation of total expenditures to major groups.[12] Young's survey of family expenditures in 1874 in the United States and Territories was considered in this context but there were difficulties in reconciling weekly and annual data for groups with total expenditures.[13] The distribution of the 1875 expenditures as used in the weighting system for the consumer price index is shown in Table 4.

TABLE 4

Distribution of Family Expenditures in 1875, by Major Group

Group	*Value*	*% of Total*
All commodities and services	$726.70[a]	100.0
Food	417.36	57.4
All items other than food	309.34[b]	42.6
Clothing	110.40	15.2
Rent	128.47	17.7
Fuel and light	51.34	7.0
Other	19.13[c]	2.7

[a] Gifts and contributions ($7.74) and organization expenses ($2.93) were deducted from total outlay of $737.37 to conform with present BLS practice.

[b] Includes miscellaneous goods and services ($17.16), allocated proportionately to the groups specified.

[c] Includes estimates for medical care ($7.70), newspapers ($7.70), and soap and starch ($3.73).

An analysis of the 1875 study by five income ranges showed that the distribution of expenditures for all families combined was very similar to that for the next to the highest income class. In view of the geographical and occupational restrictions upon the selection of the sample, this observation is not particularly reassuring, but it shows that the heavy food proportion did not result from unduly heavy sampling of the lowest income groups. It was also noted that the combined expenditures for rent plus fuel and light amounted to about 25 per cent of the total. This approximate proportion shows up in many studies and is associated with the adage that people should spend about one-fourth of their income for housing.[14] Finally, the distribution of expenditures obtained from the 1875 Massachusetts study accords well with the percentage distribution shown in Young's survey, which was as

[12] *Sixth Annual Report*, Massachusetts Bureau of Statistics of Labor, March 1875, pp. 192–450.

[13] Young, pp. 811–826.

[14] See "Rent and Income—What is the Relationship?" by Helen Humes, in *Journal of Housing*, April 1946, pp. 72–73.

follows: food, 50; clothing, 16, fuel and light, 8, rent, 18; other, 8. These food and fuel proportions may be understated and rents and "other" overstated because of the method used to obtain an annual U.S. average.

Although some expenditure data were available in the Massachusetts study for items below the major group level, generally it was necessary to weight individual items on the basis of the distribution of expenditures for 232 families in 1890–91 as shown in the Aldrich Reports.[15] This is the only study made during the century that provides the detail necessary for an index weighting system. Even so, some arbitrary estimates were necessary for items in subcategories.

In determining the final weights, expenditures for unpriced items were allocated to priced items in the same group, on the assumption that similar goods would tend to have similar price movements; for example, unpriced foods are more likely to move with priced foods than with some combination of foods and nonfoods. The actual derivation of 1875 expenditure weights is described in Appendix D. The percentage distributions of the weights for the priced items are shown in Appendix B.

Expenditure values for 1860 were estimated by applying individual item price indexes to the derived 1875 values. This procedure assumes that the quantity purchased remained the same over the years. Probably some shifts in consumption occurred from pre-Civil War to post-Civil War years, but since there are no data for the earlier period, no adjustments were possible. In continuing the indexes forward from 1880 it would be more appropriate to employ a new weighting system based on the 1890–91 or 1901 expenditure studies than to continue with the 1875 pattern.

BASE PERIOD

1860 was adopted as a base period to facilitate comparison with Wesley C. Mitchell's cost of living indexes for 1860 to 1880.

METHOD OF CALCULATION

Formula

The algebraic equivalent of the fixed quantity weighted index was used:

$$I = \frac{\Sigma \left[p_o q_a \left(\frac{p_i}{p_o} \right) \right]}{\Sigma p_o q_a}$$

[15] These data are summarized in *Retail Prices and Wages*, Senate Committee on Financc, 52d Cong., 1st sess., S. Rept. 986, July 19, 1892, Part 1, pp. xlii and xliii, and given in detail in Part 3, pp. 2040–2096, referred to also as the Aldrich Report. (Cf. footnote 7.)

where p_o are prices in the base year and p_i are prices in a given year, and q_a are the quantities purchased by families in 1875. This is in line with the calculation procedures now used by BLS for its Consumer Price Index.

Price Indexes for Each Item

An index for each item was calculated by using a comparability procedure. This involved computing two averages of the prices for each item for each year—the first composed of prices from firms reporting for both the preceding year and the given year and the second for firms reporting for the given year and the following year. Year-to-year relatives were based on these comparable average prices and an index on the 1860 base obtained by chaining together the year-to-year relatives.

Group and All Items Indexes

To combine the individual items, estimated 1860 values for the individual items were multiplied by index numbers for the corresponding items to secure the costs for each year. These were summed by years and divided by the sum of the base year values. For overalls, the only item for which data were not available for the full period, the linking procedure was used with weights redistributed within the clothing group.

Comparison with Earlier Estimates

MITCHELL

The weighted cost of living index compiled by Wesley C. Mitchell for his study of *Gold, Prices, and Wages under the Greenback Standard* was the result of manifest care and attention to every detail and his price relatives have been used in many studies as evidence of changes in retail prices from 1860 to 1880.[16] Initially, the intention was to extend Mitchell's index back to 1851 if the source materials permitted. However, since Mitchell's report appeared, much experience has been gained in index making and price collection. The continuous changes in the kinds and qualities of goods in our mass markets and the discontinuities in sample data have given rise to new techniques for handling retail price statistics. Another consideration was that the Mitchell indexes are based on less than half of the available data. Hence, the decision was made to retabulate the basic price data from the Weeks Report for the full period, evaluate them, and to calculate a new index using the data to the maximum extent, utilizing methods now employed by BLS in index number construction so far as feasible.

[16] University of California Publications in Economics, Vol. 1, March 27, 1908, pp. 63–91.

A comparison of the present consumer price index (CPI) with Mitchell's figures for the twenty-one years common to both is provided in Table 5 and Chart 2. (The chart also shows Falkner's weighted

TABLE 5

Comparison of the Consumer Price Index with Mitchell's Cost of Living Index, 1860–1880

Year	*CPI* (1860 = 100)	*Mitchell*[a] (1860 = 100)	YEAR TO YEAR CHANGE *CPI* (per cent)	YEAR TO YEAR CHANGE *Mitchell* (per cent)
1860	100	100		
1861	101	104	+ 1	+ 4
1862	113	117	+12	+12
1863	139	140	+23	+20
1864	176	170	+27	+21
1865	175	179	− 1	+ 5
1866	167	177	− 5	− 1
1867	157	169	− 6	− 5
1868	154	168	− 2	− 1
1869	147	161	− 5	− 4
1870	141	156	− 4	− 3
1871	135	149	− 4	− 4
1872	135	148	0	− 1
1873	133	145	− 1	− 2
1874	129	142	− 3	− 2
1875	123	138	− 5	− 3
1876	119	134	− 3	− 3
1877	118	132	− 1	− 1
1878	111	128	− 6	− 3
1879	108	126	− 3	− 2
1880	110	128	+ 2	+ 2

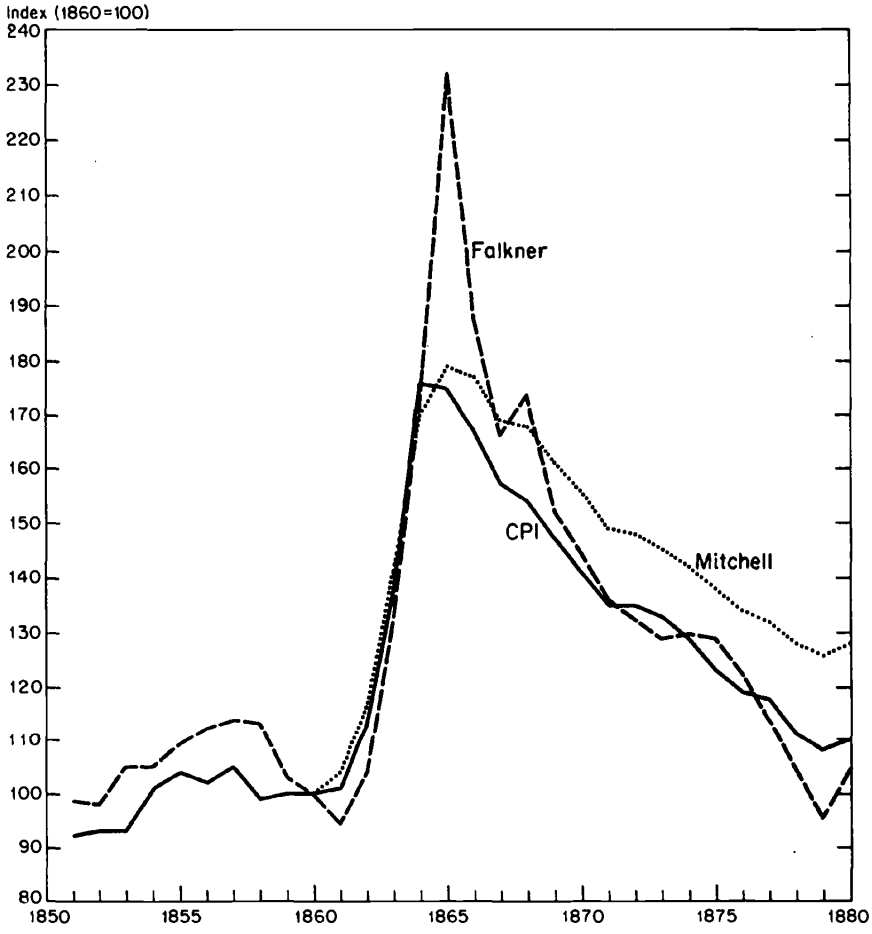
[a] Mitchell, p. 91.

relative price series, discussed below.) Immediately apparent is the difference in the timing of the Civil War peak. In the new index the high point on an annual basis was in 1864 with a very small decline recorded in 1865. Mitchell's peak was in 1865. To pinpoint the turning point accurately, monthly data would be required. The Warren and Pearson index indicates that wholesale prices reached their peak during the third quarter of 1864 and that the 1864 year average for all commodities was 4 per cent higher than the average for 1865.[17] At the retail level, there was a sharp downturn for clothing after 1864 but

[17] G. F. Warren and F. A. Pearson, *Wholesale Prices for 213 Years, 1720 to 1932*, Cornell University Agricultural Experiment Station, Memoir 142, November 1932, pp. 7–10.

CHART 2

Comparison of the Consumer Price Index, All Items, with Mitchell's Cost of Living Index, 1860–1880, and with Falkner's Weighted Relative Price Series, All Items, 1851–1880



Source: CPI data from Table 1, Col. 1; Falkner data from *Wholesale Prices, Wages and Transportation*, Report by Sen. Aldrich from the Committee on Finance, March 3, 1893, 52 Cong., 2d sess., pt. 1, page 93.

continued increases for the other major groups. The new index includes a food price increase of about 2 per cent from 1864 to 1865, while Mitchell's index includes a rise of over 9 per cent in this most important component (see Appendix E). The difference in these estimates accounts in part for the difference in the timing of the war peak. However, from 1865 to 1880, the present index for all items declined 37 per cent, or at the rate of about 3 per cent per year, while Mitchell's index declined 28 per cent, or just over 2 per cent per year. Furthermore, the contrast in the movements of the two series is far greater for most individual articles than for all items combined. Differences in the behavior of the two indexes are attributable to the price and expenditure materials used as well as to the methods of computation employed.

Comparisons for the fifty-eight items common to both indexes are given in Appendix A. If personal consumption expenditures were deflated by individual price series, the choice of price series would produce significant differences in the results.

Choice of Data from the Weeks Report

With few exceptions Mitchell selected series that were continuous for all years from 1860 to 1880, provided they were expressly designated as year averages. These restrictions, imposed partly by his method of calculation and partly to avoid using June 1 data as representative of the year, made more than half of the available data ineligible for this index. In the present case, all of the series were utilized, provided they covered at least three consecutive years. This criterion made three to five times as much data eligible for the new index. The use of single-month quotations may be questioned, but detailed comparisons indicated that this consideration was less important than securing a broader city selection.

Combination of City Prices for Each Item

Mitchell computed a relative price for each city for each item and made an arithmetic average of the relatives. For the new index, item relatives were computed from averages of quoted prices by a comparability procedure. Averages of relatives have implicit weighting by size of price change, while relatives of averages have implicit weighting by price level. The price averages probably include quotations for a range of qualities, but the larger sample tends to minimize the effect of a few aberrants. Furthermore, where it was obviously necessary, extremely high or extremely low prices were discarded. Test calculations showed that differences for individual items were rarely caused by the method of averaging. The major differences stem from the inclusion of more quotations, a factor which reduces the effect of large price changes in a few cities.

Method of Imputing Unpriced Items

Mitchell assumed that price changes for all unpriced items averaged the same as price changes for all priced items combined. For the CPI, unpriced items in each group were assumed to have the same average price change as priced items in the same group, an assumption now used generally for the major price indexes. Differences in the importance of the major groups resulting from these two assumptions are shown in Table 6.

TABLE 6

Comparison of Distributions of Family Expenditures and Weights in the Consumer Price Indexes and in Mitchell's Cost of Living Index, by Major Group

(per cent)

	CPI		MITCHELL		
	Distribution of Expenditures		*Distribution of Expenditures*		
Group	*from which Weights Were Derived*	*Relative Importance in 1875*[a]	*from which Weights Were Derived*[b]	*for Priced Items*[b]	*Weights*[c]
Food	57.4	57.4	42.5	31.6	56.7
Clothing	14.3	15.2	14.9	3.1	5.6
Rent	16.7	17.7	16.0	16.0	28.7
Fuel and light	6.7	7.0	5.3	4.7	8.5
Other	4.9	2.7	21.3	0.3	0.5
	100.0	100.0	100.0	55.7	100.0

[a] See Appendix D. These relative importance figures change to some extent from year to year depending on differential price changes.

[b] Mitchell, p. 85.

[c] Represents the weights used by Mitchell redistributed to 100 per cent as total, thereby including imputed values automatically.

Differences in Weights

Mitchell derived his weights from the BLS study of family expenditures in 1901 for both items and groups. For the new index, the 1875 Massachusetts study was used for groups and the 1890–91 study for distribution within groups. The importance of food is about the same in both indexes, but for clothing and rents the differences are striking. Clothing showed the largest increase of all the groups from 1860 to 1864 and 1865 while rent showed the least. From the Civil War peak to 1880, the largest decline was for clothing and the smallest for rent. If it were not for the heavy weighting of rent and the light weighting of clothing by Mitchell, the differences between his all items index and the new CPI would be more pronounced.

Within the groups, the distributions of the weights differ greatly. The meat category represents almost 40 per cent of total food in Mitchell's weighting system compared to 24 per cent for the present index. There were also important differences among the item weights.

Additions to the Weeks Report

No additions were made by Mitchell, and only relatively minor ones by the present author, because of the difficulty of securing data.

Index Calculation Method

Mitchell used fixed percentage weights for combining item relatives while the equivalent of a combination of average prices with fixed quantity weights was used in the new index.

In order to determine whether the variations between the two indexes result primarily from differences in the weights or from differences in the price relatives, two special indexes for all items and several groups were calculated for five selected years. Index A was based on Mitchell's weights and the new item relatives, and Index B on Mitchell's relatives with the 1875 weights used for the CPI. Table 7 shows the results of these calculations.

Although indexes A and B are not precisely comparable with the new index (weights and price relatives were missing in the Mitchell data for the additional items in the CPI), column 5 provides a rough measure of the effect of the two sets of weights, and column 6 of the different price relatives. In most instances, varying the weights produced smaller differences than varying the price relatives.

OTHERS

Various statisticians besides Mitchell have derived estimates for parts of the nineteenth century. Most of these estimates have been based on the more prolific data available at the wholesale level and the authors have usually qualified their conclusions by stating that lesser fluctuation could be expected at the retail level, or else they have made rough adjustments to approximate this result. However, allowances have seldom been made for changes in rents and services.

Two of the indexes used most frequently are discussed below. The indexes have been identified by the author's name.

Roland P. Falkner, Aldrich Reports

The most widely known and quoted reports were issued by the Senate Committee on Finance in 1892 and 1893 (i.e. the Aldrich Reports).[18] The statistician for the Subcommittee, Roland P. Falkner, summarized wholesale and retail prices for more than two hundred

[18] The summary indexes referred to appear in *Wholesale Prices*, Part 1, pp. 91, 93, 94.

TABLE 7

Comparison of the Consumer Price Indexes with Mitchell's Cost of Living Index, and with Indexes Formed by Shifting Their Relatives and Weights, Selected Years, 1864–1880

(1860 = 100)

Group and Year	CPI (1)	Mitchell[a] (2)	Index A[b] (3)	Index B[c] (4)	Difference between CPI and Index A (3) − (1) (5)	Difference between CPI and Index B (4) − (1) (6)
All items						
1864	176	170	162	179	−14	+ 3
1865	175	179	166	186	− 9	+11
1870	141	156	144	153	+ 3	+12
1875	123	138	128	133	+ 5	+10
1880	110	128	114	122	+ 4	+12
Food						
1864	167	171	163	169	− 4	+ 2
1865	170	187	169	183	− 1	+13
1870	143	164	147	158	+ 4	+15
1875	129	141	129	135	0	+ 6
1880	111	131	111	126	0	+15
Meats and fish						
1864	142	158	149	153	+ 7	+11
1865	161	175	166	168	+ 5	+ 7
1870	154	155	157	152	+ 3	− 2
1875	134	135	133	133	− 1	− 1
1880	116	122	115	119	− 1	+ 3
Clothing						
1864	261	355	314	294	+53	+33
1865	238	324	278	275	+40	+37
1870	141	153	139	142	− 2	+ 1
1875	105	113	107	110	+ 2	+ 5
1880	94	96	90	95	− 4	+ 1
Rent						
1864	130	130	[d]	[e]		0
1865	134	135	[d]	[e]		+ 1
1870	142	144	[d]	[e]		+ 2
1875	129	141	[d]	[e]		+12
1880	127	133	[d]	[e]		+ 6
Fuel and light						
1864	155	177	171	174	+16	+19
1865	159	179	173	178	+14	+19
1870	126	147	136	162	+10	+36
1875	110	134	123	143	+13	+33
1880	95	117	107	122	+12	+27

[a] Group indexes calculated by author from Mitchell data (see Appendix E).
[b] CPI item relatives with Mitchell's weights.
[c] Mitchell's item relatives with CPI weights.
[d] Same as col. 1.
[e] Same as col. 2.

commodities in the form of relative prices for individual items and, in the case of wholesale prices, as index numbers for groups and all items. The retail price data cover a twenty-eight month period and thus have such limited usefulness that they are referred to infrequently. However, the wholesale price information extends over fifty years—from 1840 to 1891—and is a valuable source of information.

Indexes based on wholesale prices for January of each year were used by Falkner and by many later investigators as estimates of annual changes in the cost of living. Three "all items" indexes were computed. One was a simple average of relatives for all articles, while two were weighted according to family expenditures in 1890–91 (from the study conducted concurrently with the price collection). One weighted index assumed that prices for all unpriced articles remained unchanged while the other assumed that the average price change for all unpriced items was the same as for all priced items. Indexes for major groups were obtained as unweighted averages of relatives but weighted indexes for food and clothing were also compiled.

The indexes have some obvious deficiencies, particularly as measures of cost of living. Relative prices were averaged without taking account of gaps in the series, either by interpolation or linking. Although quarterly data were available, January prices were used to represent the year. For some commodities in some years, especially 1865, the January prices differed materially from annual averages estimated from four quarterly prices. The timing and amplitude of changes at wholesale probably did not correspond with retail changes, and no adjustments were made for this factor. The principal limitations on commodity coverage for cost-of-living estimates were the lack of data for rent and services.

In Charts 2 (above), 3, and 4, Falkner weighted indexes for all items; food and clothing are compared with the corresponding components of the CPI from 1851 to 1880.

W. Randolph Burgess

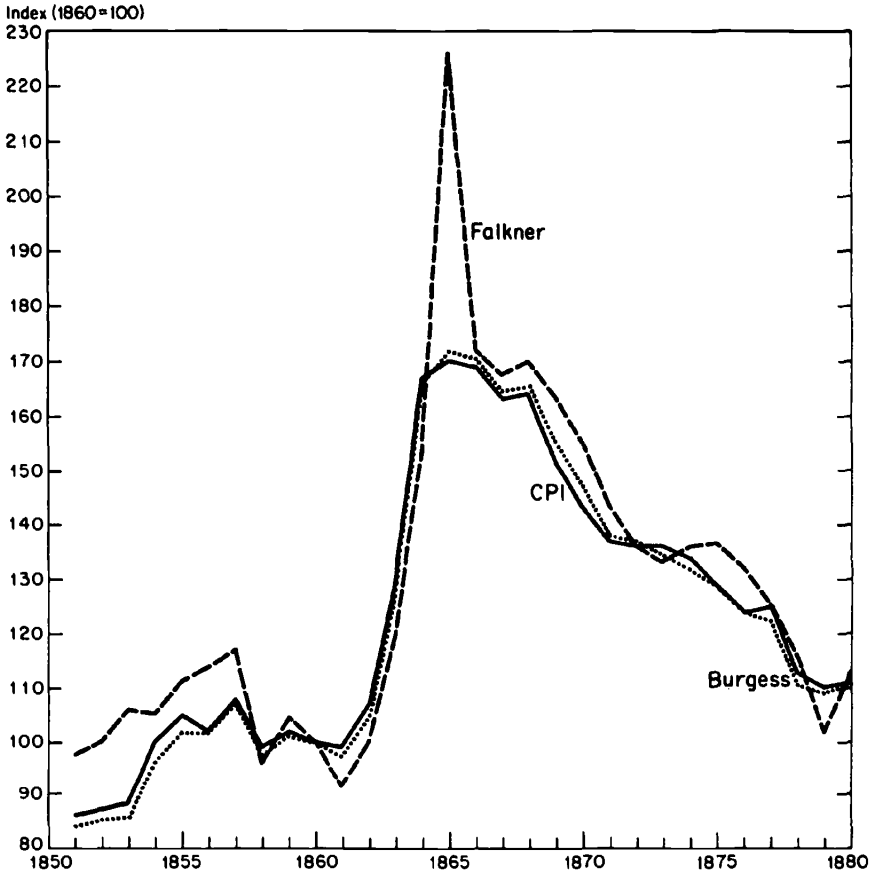
In order to determine the purchasing power of teachers' salaries, Burgess constructed a "cost of living" index, after searching the literature and failing to "discover any adequate index of the cost of living for a long period of time."[19] He decided that the best index would be one measuring changes in retail prices of food.

His cost of living measure is expressed in dollars and covers the years 1841 to 1920. Prices for ten commodities important in wage earners' food budgets were combined with quantity weights. The total weekly expenditure by a typical wage earner's family of four for food, shelter, clothing, and incidentals was obtained by adjusting the food cost

[19] W. Randolph Burgess, *Trends of School Costs*, Russell Sage Foundation, 1920.

CHART 3

Comparison of the Consumer Price Index with Falkner's Weighted Relative Price Series and Burgess Cost of Living Index, Food, 1851–1880

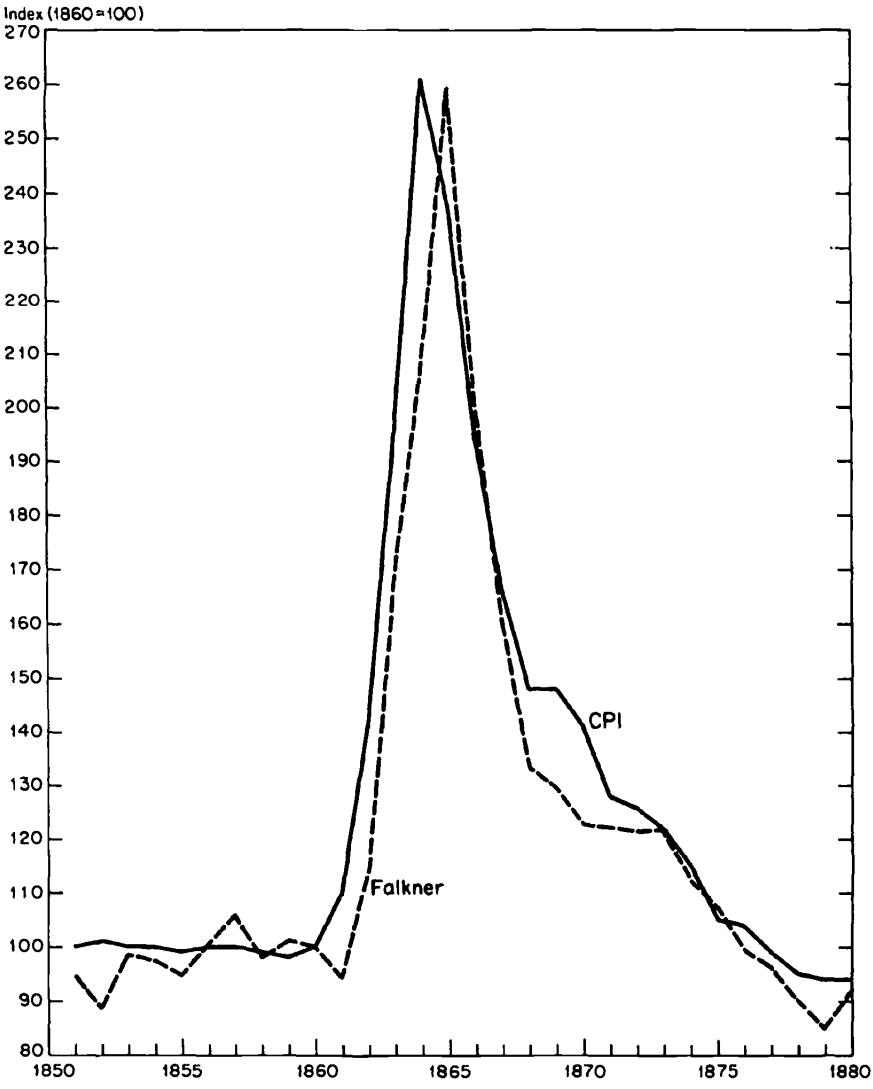


upward, thus assuming that other items fluctuated with food prices. This final total, he stated, represented the weekly cost for a small family "assuming that they lived on about the same scale as a typical workingman's family in 1901." The prices for the ten foods were assembled from various official publications and from miscellaneous records and reports.

The dollar figures published by Burgess were converted to index numbers on a 1860 base to correspond with that for the CPI. Chart 3 compares the Burgess index with the food component of the CPI.

CHART 4

Comparison of the Consumer Price Index with Falkner's Weighted Relative Price Series, Clothing, 1851–1880



Consumer Price Indexes, 1880–1914

Estimates of changes in consumer prices were derived for the years 1880 to 1914 to tie in the present index with the Consumer Price Index of the Bureau of Labor Statistics. These estimates are given in Table 8.

TABLE 8
Estimated Consumer Price Indexes, 1880 to 1914
(1860 = 100)

Year	*Index*	*Year*	*Index*
1880	110	1900	95
1881	111	1901	96
1882	112	1902	97
1883	107	1903	100
1884	104	1904	101
1885	102	1905	101
1886	102	1906	102
1887	102	1907	106
1888	104	1908	104
1889	104	1909	103
1890	103	1910	108
1891	104	1911	108
1892	103	1912	110
1893	102	1913	112
1894	97	1914	113
1895	95		
1896	95		
1897	94		
1898	94		
1899	94		

Because of the scarcity of retail price data for the years from 1881 to 1890, most estimates of changes in the cost of living during this period rely heavily on the movement of wholesale prices. The estimates presented here are no exception.

Three indexes were combined using group weights from the 1890–91 study of family expenditures. For the food component, the Burgess index was used since it corresponds closely with the present index for food from 1860 to 1880. The weighted index of wholesale prices of clothing prepared by Roland Falkner for the Aldrich Committee was adopted for clothing. Its correspondence with the clothing component of the new index for earlier years is only fair and it probably overstates the fluctuations that actually occurred at the retail level but it was the only series available. Rents were assumed to be constant, as estimated

by Snyder.[20] The remaining items were assumed to have the same average movement as food, clothing, and rent combined.

Although the resulting estimates are crude, they derive some support from Rees's revision of Douglas's "Most Probable Index of the Movement of the Total Cost of Living for Workingmen." The Douglas index showed a decline of about 3 per cent from 1890 to 1891 while Rees's figures show an increase of about 1 per cent. An estimate of this yearly price change derived by combining the three indexes specified above also shows an increase of about 1 per cent.

From 1890 to 1914, Rees's figures have been spliced to the estimates for the earlier years.[21]

[20] Carl Snyder, *Business Cycles and Business Measurements*, Russell Sage Foundation, 1927, pp. 137 and 291.

[21] The preliminary indexes obtained by Rees are contained in *Investing in Economic Knowledge*, 38th Annual Report, National Bureau of Economic Research, May 1958, p. 59. The Douglas indexes are included in *Real Wages in the United States, 1890–1926*, by Paul H. Douglas, Houghton Mifflin, 1930, p. 60.

APPENDIX A

Index Numbers for Individual Items Included in the Consumer Price Indexes, 1851–1880, and in Mitchell's Cost of Living Index, 1860–1880

TABLE A-1
Food
(1860 = 100)

	CEREALS AND BAKERY PRODUCTS									
	Flour, Wheat, Superfine		*Flour, Wheat Extra Family*		*Flour, Rye*		*Corn Meal*		*Rice*	
Year	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*
1851	93		84		83		79		91	
1852	83		76		82		80		90	
1853	88		83		90		85		95	
1854	120		110		112		96		100	
1855	129		122		125		104		107	
1856	108		107		106		92		106	
1857	112		113		116		111		108	
1858	91		93		95		93		96	
1859	107		105		102		104		95	
1860	100	100	100	100	100	100	100	100	100	100
1861	106	111	105	106	96	103	98	111	113	113
1862	111	117	110	112	106	109	102	118	137	159
1863	137	162	136	157	129	157	131	143	161	187
1864	172	189	169	186	178	198	177	174	202	220
1865	179	208	178	203	186	215	184	190	201	217
1866	199	225	200	212	191	217	177	183	189	211
1867	206	218	209	209	200	210	178	188	180	191
1868	182	188	186	180	188	188	172	174	176	196
1869	146	179	152	173	156	179	155	168	166	188
1870	135	170	138	168	142	172	154	167	146	177
1871	137	149	137	152	131	152	134	146	150	169
1872	152	154	155	157	134	144	132	136	150	165
1873	148	150	150	152	131	146	126	134	145	161
1874	138	142	141	146	134	147	138	140	142	157
1875	127	140	129	136	124	145	131	140	136	141
1876	130	148	129	147	121	148	124	137	130	141
1877	144	147	146	146	130	150	128	136	125	139
1878	118	137	119	139	109	131	112	128	124	138
1879	112	127	113	125	104	129	109	125	123	130
1880	112	129	113	125	106	132	110	129	122	133

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TABLE A–1, continued

MEATS AND FISH

Year	*Beef, Fresh, Roasting Pieces*		*Beef, Fresh, Rump Steaks*		*Beef, Fresh, Soup Pieces*		*Beef, Corned*		*Pork, Fresh*	
	CPI	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*
1851	85		84		77		80		86	
1852	85		83		79		78		93	
1853	89		85		83		84		92	
1854	92		87		86		88		90	
1855	99		93		93		98		94	
1856	101		95		93		99		98	
1857	103		101		100		100		107	
1858	100		101		100		102		99	
1859	102		103		102		103		95	
1860	100	100	100	100	100	100	100	100	100	100
1861	99	106	97	105	99	118	99	103	103	115
1862	103	109	102	106	104	121	104	103	102	120
1863	118	130	117	127	115	131	116	117	119	134
1864	146	156	146	153	150	158	142	134	161	186
1865	164	169	160	165	164	170	157	147	185	216
1866	168	169	164	165	168	175	155	147	179	228
1867	163	171	162	166	158	166	148	135	170	223
1868	162	167	161	156	156	150	154	148	174	217
1869	159	162	160	157	152	148	150	138	174	204
1870	157	155	159	151	150	144	147	128	168	176
1871	147	142	151	135	137	132	138	121	144	152
1872	146	141	148	135	138	132	134	117	133	150
1873	145	142	146	135	132	130	129	112	132	156
1874	141	137	144	132	127	125	126	111	131	160
1875	137	135	141	127	123	121	127	109	133	163
1876	137	136	137	129	122	123	122	111	129	159
1877	129	130	130	126	115	120	118	109	122	152
1878	126	123	126	124	114	119	114	104	110	140
1879	120	120	122	124	109	120	110	103	107	142
1880	121	118	121	118	110	119	112	105	110	143

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TABLE A–1, continued

Year	*Pork, Corned and Salted*		*Pork, Bacon*		*Pork, Smoked Hams*		*Pork Shoulders*		*Pork Sausage*	
	CPI	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*
1851	84		88		91		89		88	
1852	102		92		92		87		88	
1853	92		88		93		90		90	
1854	94		87		94		92		92	
1855	95		89		97		95		99	
1856	102		92		98		98		100	
1857	108		107		106		111		104	
1858	101		99		100		101		102	
1859	99		99		101		103		102	
1860	100	100	100	100	100	100	100	100	100	100
1861	103	112	102	105	93	104	112	128	99	107
1862	104	117	104	113	95	107	118	138	101	114
1863	121	141	117	120	106	122	127	152	109	124
1864	168	176	152	153	144	157	167	185	136	139
1865	196	210	168	166	174	186	189	204	160	165
1866	186	208	156	161	167	183	183	200	153	168
1867	173	201	152	175	154	171	173	202	147	164
1868	179	210	159	168	158	174	179	205	147	160
1869	180	205	159	157	157	168	184	203	152	159
1870	174	185	156	150	154	158	185	190	146	148
1871	147	160	134	140	136	145	152	155	135	130
1872	134	151	125	139	126	137	140	152	127	129
1873	131	145	121	130	125	130	139	148	122	130
1874	132	157	123	130	121	134	142	153	121	128
1875	139	163	130	131	124	135	144	154	123	122
1876	136	153	133	130	122	137	142	152	116	121
1877	127	148	121	134	111	125	126	144	109	118
1878	109	128	106	128	100	117	113	137	98	112
1879	104	124	101	123	96	114	108	130	94	110
1880	112	128	110	128	101	115	114	124	95	110

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TABLE A–1, continued

Year	*Veal Forequarters*		*Veal Hindquarters*		*Veal Cutlets*		*Mutton Forequarters*		*Mutton Leg*	
	CPI	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*
1851	81		69		89		77		83	
1852	82		70		83		78		86	
1853	85		73		87		86		87	
1854	92		78		95		88		89	
1855	92		91		95		93		92	
1856	99		95		98		102		99	
1857	98		94		98		100		98	
1858	102		97		99		99		96	
1859	104		104		103		100		96	
1860	100	100	100	100	100	100	100	100	100	100
1861	101	111	100	110	99	102	101	110	98	108
1862	103	106	105	110	100	102	102	111	102	113
1863	117	124	116	123	106	104	118	131	112	121
1864	144	146	139	138	129	125	142	146	133	132
1865	159	162	150	144	142	136	153	162	149	154
1866	161	162	153	144	143	136	154	160	147	157
1867	158	163	153	146	146	141	152	163	147	155
1868	157	152	154	146	149	144	151	161	151	187
1869	155	152	152	147	148	140	149	157	144	154
1870	152	147	147	140	144	132	146	147	141	145
1871	141	128	140	138	138	123	139	138	135	139
1872	137	128	136	136	135	123	138	136	134	135
1873	140	125	137	131	136	123	140	135	135	131
1874	136	128	134	133	132	121	136	132	132	129
1875	135	123	133	129	132	115	136	127	130	125
1876	133	125	131	128	130	117	132	128	127	125
1877	127	114	126	121	123	114	128	120	123	126
1878	121	113	122	121	120	111	125	123	119	124
1879	116	112	118	118	116	111	117	121	116	120
1880	118	112	120	118	117	111	118	118	114	116

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TABLE A–1, continued

	Mutton Chops		*Mackerel, Pickled*		*Codfish, Dry*	
Year	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*
1851	81		92		82	
1852	85		100		89	
1853	85		98		89	
1854	88		111		94	
1855	92		106		97	
1856	98		101		98	
1857	98		107		95	
1858	97		100		93	
1859	100		100		100	
1860	100	100	100	100	100	100
1861	96	106	83	93	97	102
1862	98	108	92	111	104	112
1863	116	117	106	125	121	128
1864	135	124	127	153	149	147
1865	148	144	130	149	160	161
1866	147	146	132	152	151	166
1867	150	147	121	149	143	163
1868	150	153	116	147	145	161
1869	145	141	124	150	152	160
1870	145	136	132	142	148	156
1871	142	134	135	152	144	150
1872	138	131	126	147	142	149
1873	140	128	131	149	140	147
1874	139	128	127	144	139	143
1875	143	124	122	147	136	139
1876	140	130	120	142	135	136
1877	136	127	116	131	131	129
1878	131	121	113	130	122	126
1879	126	115	109	118	122	121
1880	128	121	110	116	123	115

continued on next page

TABLE A–1, continued

	DAIRY PRODUCTS						FRUITS AND VEGETABLES				
	Milk		*Butter*		*Cheese*		*Potatoes*		*Beans*		*Fruit*[a]
Year	*CPI*	*Mit-chell*	*CPI*	*Mit-chell*	*CPI*	*Mit-chell*	*CPI*	*Mit-chell*	*CPI*	*Mit-chell*	*CPI*
1851	97		84		79		89		95		91
1852	100		84		82		100		98		84
1853	102		85		84		78		97		99
1854	100		94		92		120		108		111
1855	104		102		101		126		112		103
1856	102		101		101		98		119		107
1857	104		109		101		118		122		112
1858	98		100		94		108		103		102
1859	102		104		97		107		96		102
1860	100	100	100	100	100	100	100	100	100	100	100
1861	115	122	88	93	88	90	97	103	92	104	103
1862	120	132	92	110	91	97	109	129	103	122	110
1863	137	154	109	129	105	113	122	144	124	142	121
1864	153	174	164	188	139	153	169	170	131	156	132
1865	154	172	155	218	155	175	155	173	135	156	137
1866	145	170	162	215	151	180	170	207	138	160	128
1867	145	171	140	210	141	177	152	166	148	172	130
1868	144	168	162	232	135	168	177	184	169	185	124
1869	141	164	150	203	143	164	137	161	155	179	127
1870	137	156	141	203	127	154	131	150	132	163	124
1871	117	131	133	194	120	139	151	164	127	157	120
1872	116	131	131	193	128	144	136	163	129	155	119
1873	115	126	137	187	124	137	142	165	129	158	116
1874	116	127	140	181	126	136	163	162	124	154	114
1875	115	127	130	169	122	134	136	150	120	146	121
1876	114	127	120	165	109	124	111	142	110	134	120
1877	111	131	111	163	113	127	149	171	113	152	112
1878	111	131	100	156	102	122	118	144	107	140	112
1879	114	131	96	162	98	118	140	145	108	145	105
1880	112	131	106	167	106	135	121	157	108	150	112

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TABLE A–1, continued

OTHER FOODS

Year	*Eggs*		*Tea*		*Coffee, Green*		*Coffee, Roasted*		*Lard*		*Sugar, Yellow B*	
	CPI	*Mit-chell*	*CPI*	*Mit-chell*	*CPI*	*Mit-chell*	*CPI*	*Mit-chell*	*CPI*	*Mit-chell*	*CPI*	*Mit-chell*
1851	86		81		82		84		81		88	
1852	96		84		80		84		83		86	
1853	90		83		80		87		87		88	
1854	103		93		86		91		88		87	
1855	113		92		85		91		91		92	
1856	108		96		87		92		94		104	
1857	107		100		89		95		109		114	
1858	98		100		90		97		99		101	
1859	100		101		95		96		102		99	
1860	100	100	100	100	100	100	100	100	100	100	100	100
1861	89	92	100	104	107	101	106	103	96	98	95	106
1862	92	103	124	137	136	131	125	124	98	106	118	133
1863	111	122	159	175	210	186	164	147	108	120	152	149
1864	139	133	199	219	275	257	212	215	140	146	212	182
1865	162	167	204	268	260	251	210	225	169	174	190	184
1866	146	163	197	254	218	243	193	221	166	175	170	175
1867	140	174	194	245	210	232	177	204	146	173	155	155
1868	156	190	184	222	190	207	162	185	156	179	150	150
1869	138	155	179	207	188	179	164	171	164	182	146	150
1870	133	159	173	201	177	174	149	166	151	162	137	148
1871	128	159	160	175	163	171	144	175	129	126	130	149
1872	123	162	156	163	174	171	151	169	116	116	122	144
1873	129	159	147	147	173	166	152	167	115	112	116	138
1874	119	148	137	133	181	161	155	163	121	121	110	132
1875	121	150	123	124	171	158	152	156	137	130	108	127
1876	115	147	120	119	163	143	147	155	128	128	108	126
1877	108	140	112	105	157	140	140	149	113	111	110	121
1878	100	143	108	107	150	141	133	139	96	100	97	115
1879	100	143	101	102	135	123	120	130	92	97	91	114
1880	102	142	97	102	132	118	118	125	98	107	94	113

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TABLE A-1, concluded

Year	Sugar, Yellow C		Sugar, Good Brown		Molasses, New Orleans		Molasses, Porto Rico		Sirup	
	CPI	Mitchell	CPI	Mitchell	CPI	Mitchell	CPI	Mitchell	CPI	Mitchell
1851	82		82		88		89		98	
1852	83		82		87		91		97	
1853	83		82		92		92		98	
1854	85		83		94		96		98	
1855	90		89		96		97		95	
1856	100		106		106		107		100	
1857	110		114		122		132		112	
1858	101		102		99		104		102	
1859	98		98		102		106		101	
1860	100	100	100	100	100	100	100	100	100	100
1861	100	105	96	101	98	101	106	111	98	103
1862	119	129	115	123	116	138	120	131	105	119
1863	154	150	153	145	155	182	154	186	132	144
1864	212	182	219	200	218	232	222	241	180	187
1865	197	194	198	198	206	235	213	225	177	189
1866	178	187	184	202	207	230	202	217	168	200
1867	162	172	164	182	193	215	202	219	168	212
1868	158	164	157	170	190	210	202	212	164	193
1869	157	164	152	172	188	205	185	213	162	190
1870	141	161	136	156	181	200	191	188	150	176
1871	130	143	129	153	175	201	185	186	142	158
1872	125	141	126	152	176	196	183	179	135	153
1873	124	134	122	143	174	187	182	179	130	148
1874	112	129	113	138	171	178	179	182	128	146
1875	111	123	109	124	163	172	168	163	129	137
1876	111	121	109	124	154	162	168	163	126	129
1877	113	117	110	126	151	164	165	168	121	129
1878	102	114	100	118	142	162	156	168	115	121
1879	93	113	92	113	132	156	144	139	107	120
1880	99	112	95	116	131	149	142	139	104	116

[a] Estimated from wholesale prices.

The sources of this and the following tables are described in the text and the text footnotes.

TABLE A-2
Clothing
(1860 = 100[a])

Year	*Mousselines de Laine*		*Satinets*		*Cotton Flannel*		*Shirtings, Bleached*		*Shirtings, Brown*		*Sheetings, Bleached*	
	CPI	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*
1851	104		105		101		107		97		104	
1852	104		106		103		107		96		104	
1853	101		105		103		104		97		102	
1854	101		104		102		104		96		103	
1855	101		104		101		104		95		103	
1856	101		102		101		104		96		103	
1857	101		101		102		100		99		101	
1858	95		102		101		101		101		100	
1859	94		100		101		99		99		100	
1860	100	100	100	100	100	100	100	100	100	100	100	100
1861	114	128	105	117	123	137	111	123	121	130	115	124
1862	133	150	132	156	187	215	179	207	210	250	180	228
1863	178	185	166	188	288	305	288	335	396	465	260	320
1864	224	238	203	205	396	448	416	511	548	651	369	422
1865	201	206	180	192	368	441	355	447	455	563	318	381
1866	158	170	158	157	283	355	277	366	328	444	265	321
1867	135	134	145	138	231	280	216	266	249	342	226	274
1868	124	121	133	126	191	225	182	234	213	286	191	228
1869	117	113	129	121	174	198	156	176	184	225	171	189
1870	110	110	124	118	170	186	138	160	162	194	153	171
1871	102	99	116	112	146	155	129	158	143	176	134	144
1872	101	97	113	108	145	153	127	147	144	168	133	130
1873	97	97	110	106	137	151	118	136	135	152	129	124
1874	95	94	105	106	126	136	111	126	122	142	120	118
1875	90	92	103	104	121	130	103	116	113	129	115	111
1876	87	87	102	101	110	118	95	109	106	121	107	104
1877	82	85	100	97	104	113	91	103	100	113	102	100
1878	78	80	96	95	99	107	82	94	94	103	96	93
1879	75	80	96	95	99	107	83	95	93	100	95	91
1880	75	81	96	95	98	101	84	96	93	98	96	92

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TABLE A–2, continued

Year	*Sheetings, Brown*		*Prints*		*Tickings*		*Overalls*[a]	*Boots*		*Shoe Repairs (tapping)*
	CPI	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*CPI*	*Mitchell*	*CPI*
1851	104		103		105			90		100
1852	105		103		103			91		100
1853	103		102		102			92		100
1854	103		102		102			92		100
1855	101		100		101			93		100
1856	101		100		102			97		100
1857	100		100		100			96		100
1858	99		100		98			96		100
1859	100		99		98			98		100
1860	100	100	100	100	100	100		100	100	100
1861	127	135	104	109	115	130		102	104	100
1862	199	233	142	159	155	187		116	120	100
1863	302	352	207	222	225	237		133	140	120
1864	427	469	302	342	302	335		152	160	180
1865	354	405	271	316	276	324		152	160	180
1866	277	328	204	250	221	271		146	155	180
1867	234	275	160	186	189	218		140	148	170
1868	206	239	133	153	167	194	100	138	144	170
1869	184	209	121	136	153	171	111	133	140	170
1870	167	183	111	126	144	164	116	128	135	160
1871	128	142	96	100	127	140	102	126	134	160
1872	129	134	98	101	124	139	93	125	132	160
1873	124	125	96	99	120	130	94	119	127	160
1874	114	119	86	92	110	125	94	114	122	156
1875	112	114	80	85	107	120	84	114	121	160
1876	105	105	73	80	101	112	73	108	116	160
1877	100	102	68	74	97	109	68	104	113	136
1878	93	98	64	71	92	103	71	101	109	130
1879	92	95	63	71	93	103	61	100	110	130
1880	93	96	66	73	93	104	65	99	109	130

[a] 1868 = 100 for the overalls series, estimated from data reported in the statistical supplement to *Prices Paid by Vermont Farmers*, pp. 54 and 59.

TABLE A–3
Rent and Board
(1860 = 100)

	Four Rooms		*Six to Seven Rooms*		*Board, Men*[a]		*Board, Women*[a]	
Year	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*
1851	99		100		89		83	
1852	99		100		89		83	
1853	99		100		90		85	
1854	102		102		91		86	
1855	103		103		94		90	
1856	103		103		98		97	
1857	100		100		99		98	
1858	100		100		101		101	
1859	100		100		101		101	
1860	100	100	100	100	100	100	100	100
1861	94	98	96	97	110	108	116	111
1862	102	106	101	102	119	118	128	120
1863	114	115	112	112	136	135	142	136
1864	125	125	135	134	155	155	159	156
1865	129	131	139	138	159	160	164	162
1866	132	133	143	142	154	156	159	159
1867	131	129	138	138	150	149	154	153
1868	132	131	146	146	153	153	156	155
1869	133	134	149	150	152	152	155	153
1870	135	138	148	149	151	148	150	150
1871	136	143	152	151	151	153	144	143
1872	137	145	152	150	151	153	144	143
1873	134	142	146	147	145	150	139	143
1874	127	140	141	155	142	148	136	138
1875	123	138	136	144	139	149	133	139
1876	120	133	128	133	138	147	131	137
1877	120	132	126	132	137	146	132	138
1878	123	132	125	132	135	143	129	135
1879	121	129	123	130	134	144	129	138
1880	127	132	127	134	138	146	131	138

[a] Not included in the "all items" indexes.

TABLE A–4
Fuel and Light
(1860 = 100)

	Coal, Anthracite		*Coal, Bituminous*[a]		*Wood, Hard*		*Wood, Pine*		*Coal Oil*	
Year	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*	*CPI*	*Mitchell*
1851	104		85		87		101		114	
1852	101		85		89		101		114	
1853	111		85		95		107		114	
1854	134		93		104		121		120	
1855	122		87		105		131		114	
1856	118		89		107		113		109	
1857	118		96		112		119		109	
1858	105		93		105		114		105	
1859	97		90		100		105		100	
1860	100	100	100	100	100	100	100	100	100	100
1861	107	103	106	105	104	103	124	125	85	94
1862	118	115	120	115	124	120	138	144	81	100
1863	174	167	145	151	136	135	158	169	97	154
1864	209	205	153	154	149	146	187	193	112	171
1865	218	216	144	144	164	166	183	185	124	174
1866	202	200	137	143	170	168	203	206	99	141
1867	171	172	134	139	159	161	198	203	85	127
1868	170	172	126	133	161	163	182	192	77	116
1869	172	170	124	133	160	166	193	208	67	98
1870	159	157	118	130	156	165	191	223	63	91
1871	162	159	120	135	161	167	182	189	57	69
1872	156	152	119	135	159	164	182	182	53	66
1873	160	158	114	130	158	166	181	188	49	61
1874	156	154	107	129	153	160	177	186	42	55
1875	155	155	100	126	150	155	167	174	39	51
1876	146	135	97	127	148	155	162	173	38	49
1877	129	122	97	122	135	139	143	151	36	50
1878	128	127	91	119	130	135	134	138	32	41
1879	119	114	90	118	132	135	143	137	29	36
1880	132	130	93	121	133	138	143	137	28	35

[a] Based on weighted averages of prices in large and small cities with large city weights approximately 25 per cent and small city weights approximately 75 per cent.

TABLE A–5
Other
(1860 = 100)

	Medical Care[a]								
		Home Visits							
	Office Visits	*No Mileage*	*Five Miles*	*Delivery*	*Newspapers*	*Soap*		*Starch*	
Year	*CPI*	*CPI*	*CPI*	*CPI*	*CPI*	*CPI*	*Mitchell*	*CPI*	*Mitchell*
1851	100	100	100	100	93	88		105	
1852	100	100	100	100	93	86		105	
1853	100	100	100	100	93	88		106	
1854	100	100	100	100	93	89		106	
1855	100	100	100	100	93	96		107	
1856	100	100	100	100	93	92		105	
1857	100	100	100	100	93	99		108	
1858	100	100	100	100	93	101		102	
1859	100	100	100	100	96	101		105	
1860	100	100	100	100	100	100	100	100	100
1861	119	100	100	108	100	96	96	99	102
1862	119	112	100	117	100	103	111	104	113
1863	119	112	100	122	114	120	139	117	135
1864	133	124	100	117	156	142	154	138	161
1865	152	162	175	156	136	148	164	146	178
1866	152	162	175	156	133	150	180	143	174
1867	152	166	175	167	133	136	165	137	177
1868	160	166	175	167	133	130	167	140	178
1869	160	166	175	167	137	128	164	135	171
1870	160	166	175	167	137	119	146	127	158
1871	160	166	175	167	137	118	145	121	139
1872	160	166	175	167	137	114	145	119	139
1873	164	162	167	167	140	112	132	123	133
1874	164	162	167	167	140	107	126	118	127
1875	164	162	167	167	140	105	124	115	125
1876	160	150	150	167	147	98	115	106	119
1877	160	150	150	167	148	96	115	103	113
1878	148	150	150	167	148	91	108	98	104
1879	148	150	150	167	148	88	104	94	103
1880	148	150	150	167	148	85	102	90	99

[a] Estimated from data reported in the statistical supplement to *Prices Paid by Vermont Farmers*, pp. 48, 49.

APPENDIX B

Items Priced for the Consumer Price Index, 1851–1880, and Their Relative Importance in the "All Items" and Group Indexes, 1875

Group	*% of All Items*	*% of Major Group*
All items	100.0	
FOOD	57.4	100.0
Cereals and bakery products	11.0	19.3
Flour:		
Wheat, superfine	4.3	7.6
Wheat, extra family	4.3	7.6
Rye	1.1	1.9
Corn meal	1.1	1.9
Rice	0.2	0.3
Meats and fish	13.6	23.3
Beef, fresh:		
Roasting pieces	2.6	4.4
Rump steaks	2.6	4.4
Soup pieces	0.6	1.1
Beef, corned	0.6	1.1
Pork, fresh	1.3	2.3
Pork, other:		
Corned and salted	0.3	0.5
Bacon	0.3	0.5
Smoked hams	0.3	0.5
Shoulders	0.3	0.5
Sausage	0.3	0.4
Veal:		
Forequarters	0.5	0.9
Hindquarters	0.5	0.9
Cutlets	0.5	0.8
Mutton:		
Forequarters	0.5	0.9
Leg	0.5	0.9
Chops	0.5	0.8
Mackerel, pickled	0.7	1.2
Codfish, dry	0.7	1.2
Dairy products	9.4	16.3
Milk	3.0	5.2
Butter	5.9	10.3
Cheese	0.5	0.8
Fruits and vegetables	9.5	16.4
Potatoes	4.6	7.9
Beans	2.4	4.1
Fruit	2.5	4.4
Other foods	13.9	24.7
Eggs	2.3	4.1
Tea[a]	1.3	2.3
Coffee:[b]		
Green	2.0	3.5
Roasted	2.0	3.5

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Group	% of All Items	% of Major Group
Other foods (continued)		
Lard	1.5	2.6
Sugar:		
Yellow B	1.5	2.7
Yellow C	1.5	2.7
Good brown	1.5	2.7
Molasses:		
New Orleans	0.1	0.2
Porto Rico	0.1	0.2
Sirup	0.1	0.2
CLOTHING	15.2	100.0
Mousselines de laine	2.2	14.4
Satinets[c]	1.2	8.2
Cotton flannel[c]	2.3	14.9
Shirtings:[d]		
Bleached	0.2	1.3
Brown	0.2	1.3
Sheetings:[e]		
Bleached	0.6	3.8
Brown	0.6	3.8
Prints[f]	2.1	14.1
Tickings[g]	0.2	1.3
Overalls	0.9	5.8
Boots[h]	4.0	26.5
Shoe repairs (tapping)	0.7	4.6
RENT	17.7	100.0
Four rooms	8.9	50.0
Six to seven rooms	8.8	50.0
FUEL AND LIGHT	7.0	100.0
Coal:		
Anthracite	1.6	22.5
Bituminous	1.5	22.5
Wood:		
Hard	1.6	22.5
Pine	1.6	22.5
Coal oil[i]	0.7	10.0
OTHER	2.7	100.0
Medical care	1.1	40.3
Office visits	0.5	18.1
Home visits:		
No mileage	0.3	9.1
Five miles	0.2	9.1
Delivery	0.1	4.0
Newspapers	1.1	40.3
Soap, common	0.3	13.0
Starch	0.2	6.4

[a] Oolong or other good black.
[b] Rio.
[c] Medium quality.
[d] 4 × 4, standard quality.
[e] 9 × 8, standard quality.
[f] Merrimack.
[g] Good quality.
[h] Heavy.
[i] Or carbon oil.

APPENDIX C
Examples of Individual City Data for Selected Commodities Taken from the Weeks Report

TABLE C-1

Butter: Retail Prices in Six Selected Cities, 1860–1880
(cents per pound)

	Connecticut		*Massachusetts*		*Ohio*	
Year	*Danielsonville* (June 1)	*Jewett City* (yr. av.)	*Boston* (yr. av.)	*Springfield* (unspecified)	*Canton* (yr. av.)	*Hamilton* (June 1)
1860	25	23	23	25	12	18
1861	22	22	20	24	8	12.5
1862	20	21	21	23	10	15
1863	22	25	24	25	18	25
1864	32	28	37	32	40	45
1865	35	33	42	40	35	25
1866	48	45	46	42	35	35
1867	35	36	36	40	30	25
1868	42	42	44	45	25	20
1869	40	45	44	45	20	15
1870	40	40	44	40	17	25
1871	35	42	36	40	25	25
1872	35	40	35	42	25	25
1873	38	40	37	43	20	30
1874	38	42	40	42	20	30
1875	35	38	36	38	20	25
1876	35	37.5	34	35	20	20
1877	28	32	33	33	20	20
1878	28	30	25	25	18	18
1879	25	27	28	25	16	20
1880	25	28	31	33	20	20

TABLE C-2

Eggs: Retail Prices in Seven Selected Cities, 1860–1880
(cents per dozen)

	Connecticut		*Massachusetts*		*Ohio*		
Year	*Danielsonville* (June 1)	*Jewett City* (yr. av.)	*Boston* (yr. av.)	*Springfield* (unspecified)	*Canton* (yr. av.)	*Hamilton* (unspecified)	*Springfield* (yr. av.)
1860	17	17	19.5	19	10	12.5	7
1861	13	14	17	18	6	10	10
1862	15	15	18	17	10	8.3	10
1863	18	17	21.5	20	12	20	12
1864	28	23	28	28	10	20	13
1865	32	30	36	34	10	25	15
1866	28	27	33	30	10	18	16
1867	24	25	32.7	30	10	20	15
1868	35	28	34.8	30	10	30	14
1869	40	25	32.7	33	10	20	14
1870	28	27	32	26	10	20	13
1871	28	25	28.3	25	12	15	10
1872	28	28	31	25	10	15	12
1873	25	30	30	30	15	15	12
1874	23	25	27	28	12	15	13
1875	24	25	29	25	16	18	12
1876	22	28	24	23	15	15	12
1877	18	22	24	20	14	12.3	12
1878	16	20	25	18	12	10	13
1879	17	20	21	17	12	8.3	12
1880	18	20	20	18	12	10	12.5

TABLE C–3

Cotton Flannel, Medium Quality: Retail Prices in Four Selected Cities, 1860–1880

(cents per yard)

Year	*Illinois*		*Pennsylvania*	
	Bloomington (yr. av.)	*Peoria* (unspecified)	*New Castle* (yr. av.)	*Sharon* (June 1)
1860	12.5	15	12.5	12.5
1861	15	15	15	12.5
1862	25	20	25	16
1863	40	30	45	30
1864	65	40	55	60
1865	90	60	50	50
1866	65	50	30	35
1867	40	30	28	30
1868	30	20	28	25
1869	30	15	25	20
1870	25	15	20	20
1871	25	15	16	20
1872	25	15	15	20
1873	25	15	16	18
1874	20	16	15	16
1875	20	16	15	16
1876	20	16	12.5	14
1877	15	15	12.5	12.5
1878	12.5	16	12.5	12.5
1879	12.5	15	12.5	12.5
1880	12.5	16	12.5	12.5

TABLE C-4

Satinets, Medium Quality: Retail Prices in Nine Selected Cities, 1860–1880
(cents per yard)

Year	*Ohio*			
	Canton (yr. av.)	*Cincinnati* (yr. av.)	*Springfield* (unspecified)	*Zanesville* (yr. av.)
1860	75	75	75	40
1861	75	75	75	40
1862	100	80	100	60
1863	125	85	125	100
1864	150	90	125	85
1865	125	100	125	65
1866	100	100	125	60
1867	100	85	125	60
1868	100	80	100	60
1869	90	75	100	60
1870	90	70	100	65
1871	75	75	87.5	60
1872	75	75	87.5	60
1873	70	65	87.5	60
1874	70	65	87.5	60
1875	75	60	87.5	60
1876	75	60	87.5	60
1877	75	60	87.5	50
1878	75	55	87.5	50
1879	75	55	87.5	50
1880	80	55	87.5	50

Year	*Indiana*				
	Jeffersonville (yr. av.)	*Lawrenceburg* (yr. av.)	*New Albany* (yr. av.)	*Terre Haute* (unspecified)	*Vincennes* (unspecified)
1860	75	70	62.5	n.a.	n.a.
1861	100	75	62.5	65	60
1862	100	125	75	90	75
1863	100	125	102.5	125	100
1864	100	150	102.5	175	200
1865	100	100	90	140	150
1866	100	100	90	100	125
1867	100	90	90	100	100
1868	100	80	70	85	95
1869	100	75	70	75	87.5
1870	100	75	62.5	75	75
1871	75	75	50	75	90
1872	75	75	50	75	90
1873	75	75	50	65	90
1874	75	70	50	65	85
1875	75	65	42.5	65	85
1876	75	60	42.5	65	85
1877	75	60	42.5	65	75
1878	75	60	42.5	50	75
1879	75	60	42.5	50	75
1880	75	60	42.5	60	75

APPENDIX D
Derivation of Weights

DISTRIBUTION OF EXPENDITURES AMONG MAJOR CATEGORIES

The distribution of expenditures of 397 families in Massachusetts in 1875 was used as the basic distribution for the derivation of the weights. The original figures appear in the *Sixth Annual Report* for Massachusetts (pp. 192–450), as averages for families that reported expenditures for the specified category. The data shown below are these averages adjusted to reflect the distribution for all families as well as certain minor adjustments for classification purposes.

	Expenditures	*Per cent of Total*
Total expenditures	$726.70[a]	100.0
Food	417.36	57.4
Meat	81.48	
Fish	9.68	
Milk	20.38	
Groceries	305.82[b]	
Clothing, dry goods, boots and shoes	104.28	14.3
Clothing	59.59	
Dry goods	21.22	
Boots and shoes	23.47	
Rent	121.35	16.7
Fuel and light	48.49	6.7
Fuel	43.69	
Light	4.80	
All other	35.22[c]	4.9

[a] Excluded gifts and contributions ($7.74) and organization expenses ($2.93) to conform with BLS practice.

[b] Estimate for kerosene ($4.80) deducted from "groceries" (see p. 413 of *Sixth Annual Report*).

[c] Incomplete reports show largest items of expenditure in this category probably were reading matter, liquor, and tobacco.

Expenditures for soap and starch were estimated as 10 per cent of the "all other" total, or $3.52. For reading matter and medical care, also included in "all other" expenditures were estimated at 1 per cent of total expenditures, or $7.27. The remainder of the "all other" was distributed proportionately to all categories other than food.

DISTRIBUTION OF EXPENDITURES FOR INDIVIDUAL ITEMS

The major study used to estimate family expenditures for individual items was the detailed statement of the expenditures of 232 families in

1890–91 as published in the Aldrich Report (pp. 2088–2093). In many cases, however, it was necessary to make rough estimates of the expenditures for the priced items. These rough estimates were obtained either from later expenditure studies, from text references, or from production figures, but in a few cases arbitrary assignments of values were made.

The following distributions for foods illustrate the methods used to derive weighting factors:

	Expenditures of 397 Families in Massachusetts 1875	*Expenditures of 232 Families in U.S.*[a] *1890–91*		*Estimated Expenditures in 1875*
Meat	$81.48	$77.03	100.0%	$81.48
Beef		40.95	53.2	43.32
Hog products		17.20	22.3	18.19
Poultry		2.78	3.6	2.94
Not specified		16.10	20.9	17.03
Fish	9.68			9.68
Milk	20.38			20.38
Butter	40.00[b]			40.00[b]
Other groceries and provisions	265.82	138.35	100.0	265.82
Cheese		1.73	1.2	3.19
Eggs		8.28	6.0	15.95
Tea		4.51	3.3	8.77
Coffee		13.97	10.1	26.85
Sugar		16.69	12.1	32.17
Molasses		1.44	1.0	2.66
Lard		5.27	3.8	10.10
Flour		26.82	19.4	51.57
Bread		11.42	8.3	22.06
Rice		0.62	0.4	1.06
Fruit		8.80	6.4	17.01
Potatoes		11.92	8.6	22.86
Vegetables not specified		12.55	9.1	24.19
Vinegar, pickles and condiments		1.86	1.3	3.46
Other foods		12.47	9.0	23.92

[a] Minor differences in dollar amount from summary figures in Aldrich Report due to adjustments to obtain average expenditures for all families.

[b] Estimated on basis of 130 lbs. of butter at 30 cents per lb. (See p. 417 of *Sixth Annual Report.*)

The first step in allocating expenditures for unpriced items was "direct imputation," that is, the addition of the value of an unpriced item to a priced item which is assumed to have similar price movements.

The only example of this step in the food group is flour and bread. Since prices for bread were not available, the weight for flour was increased from $51.57 to $73.63.

The second step was "indirect imputation," that is, the proportional allocation of unpriced values to all the priced items in the group. In the case of food, the values of $3.46 for vinegar, pickles, and condiments and $23.92 for other foods were distributed proportionately to the other food categories which were represented by price series. The share for flour was $5.18 (18.9 per cent of $27.38) making the final weight for all flour and meal $78.81.

The final step was the distribution of these values to the individual items priced. It was at this stage that most of the allocations were based on rough estimates. To continue the example of flour, there were four price series available—two qualities of wheat flour, rye flour, and corn meal. Of the total value of $78.81, 80 per cent was assigned to wheat flour (40 per cent to each type), 10 per cent to rye flour, and 10 per cent to corn meal. Similar breakdowns were made for other values representing combinations of priced items.

The clothing group presented the greatest difficulty since expenditure data referred to finished articles while price series (other than boots and shoes) were all for yard goods. The value for each type of garment was divided among the priced series for the types of goods most probably used or those made of the same fiber as these goods. For example, the one wool series—mousseline de laine—was assigned 50 per cent of the combined value of men's overcoats, coats, vests, and trousers; women's cloaks and shawls; and children's overcoats, coats, vests, trousers, cloaks, and shawls. The remainder of this value was assumed to be made up of 30 per cent cotton flannel and 20 per cent satinets. Shoe repairs were estimated at 5 per cent of expenditures for dry goods and clothing.

In the fuel and light group, coal expenditures were estimated as half of the fuel total and divided evenly between anthracite and bituminous. The remainder was likewise divided between the two series for wood.

For rents, equal weight was given to the four-room and six- to seven-room dwellings.

For medical care, 90 per cent of the total was divided evenly between house and office visits and 10 per cent was assigned to obstetrical care.

The percentage distributions of the final value weights for 1875 which resulted from the estimates and calculations are given in Appendix B.

APPENDIX E
Mitchell's Cost of Living Index, 1860–1880, Estimated by Major Groups

The detailed relative price data for individual items included in Mitchell's index were recombined to obtain indexes for major groups corresponding to those in the new consumer price index, 1851–1880. These group estimates for Mitchell's index are given in the following table for selected years (1860 = 100):

Year	*All Items*	*Food*	*Clothing*	*Rent*	*Fuel and Light*	*Other*[a]
1860	100	100	100	100	100	100
1864	170	171	355	130	177	157
1865	179	187	324	135	179	170
1870	156	164	153	144	147	151
1875	138	141	113	141	134	124
1880	128	131	96	133	117	101

[a] Soap and starch only.

COMMENT

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Ethel D. Hoover has made a major contribution in reworking early retail price data to form a new consumer price index for 1850 to 1880. Her index is superior to Mitchell's because it is based on current Bureau of Labor Statistics procedures and uses several times as much of the Weeks Report data plus some supplementary material. The earlier and lower Civil War price peak, and the subsequent greater decline now revealed seem to accord better with other evidence and will necessitate some reinterpretation of this price era.

Hoover's index for 1880–90 is less satisfactory because it is based largely on wholesale data but it should not be too difficult to devise a better index to bridge this gap. The Aldrich Report retail price data for 1889–91 might be used in conjunction with the Weeks Report data for 1880 to establish decadal changes for certain commodities, while the 31st *Annual Report* of the Massachusetts Bureau of the Statistics of Labor and the Vermont study might provide data on movements during the decade, particularly for food. Further research of the type done by Rees, especially for rents, could augment this material.

The CPI could not profitably be pushed back earlier than 1850 without extensive research—although the Vermont study and the earlier Massachusetts data provide a starting point.

The new consumer price index is valuable not only in its own right,

but as a demonstration of what can be done with other early price data. For example, a sufficient quantity of data has now been collected to warrant the construction of a new comprehensive wholesale price index for the United States. Data include: the wholesale price indexes for six cities from 1700 to 1861 constructed under the auspices of the International Scientific Committee on Price History, three of which have been extended to later decades; the wholesale price data in the Aldrich Report covering an extensive list of commodities in one to five markets for 1840 to 1891, and later extended by the Department of Labor; and the producers' prices available in the 10th and later censuses going back in some instances to 1830. There are also available special studies of prices of particular commodities or groups of commodities in various periods. An index based on existing materials would be subject to revision in the light of further research but this fact should not act as a deterrent to the project.

Construction of a national wholesale price index for the nineteenth century is no small task. Existing indexes are not uniform with respect to weights, methods of averaging, or in other ways. It would be necessary to go behind the indexes to the basic commodity data or index numbers, and build up groups according to modern methods of index number construction. Mrs. Hoover has pointed the way to such a reconstruction.

Mrs. Hoover has carefully pointed out the limitations of the available price data. Yet one wonders if these early statistics are really much inferior to the data underlying modern indexes. Although the Bureau of Labor Statistics sometimes adjusts price series for quality changes, when these are associated with changes in unit costs, no really satisfactory method has been devised to isolate the "pure" price factor. Since quality change was probably less important in the nineteenth century than today, this problem was less serious for intertemporal and interproduct comparisons in that period—also the problem of linking in new products. While the specifications for many of the commodities for which historical price data exist are so vague that supposedly identical products may differ over time, the Department of Agriculture deliberately allows the product types included in its index of prices paid by farmers to vary so that changes in product mix will show up as price changes. The Interstate Commerce Commission has never published a detailed description of its methods of preparing indexes of prices paid by the railroads for equipment and other items—so that as much as these series are used, one cannot be sure how consistent the underlying commodity specifications are over time.

I have been asked to comment on the possible use of nineteenth century price indexes for deflation of the gross national product. For this purpose, the price indexes should be made available in at least as

much group detail as are the current value national product estimates. If one deflates in product detail, and then divides the current by the constant dollar aggregates, the implicit deflator has, in effect, changing quantity weights. The individual price indexes underlying the commodity group indexes should also be combined by the Paasche formula if a true Lespeyre quantity measure is desired. However, occasionally changing weights as suggested by Mrs. Hoover should provide an adequate approximation to this result.

Since the product estimates are national in scope, the price deflators should be as geographically representative as possible. Existing wholesale price indexes tend to overweight eastern and seaboard cities. Berry found that with respect to Cincinnati and the Ohio Valley, as the region developed, farm prices rose and nonfarm prices fell relative to prices in eastern markets.[1] If this pattern is typical, more data for developing western markets should be incorporated in wholesale price measures.

The new consumer price index is based on city prices. However, as we move back in time, the relative importance of consumer outlays in rural areas increases. Price series based on records of country stores, or records of prices paid by farmers for family living, such as were exploited by T. S. Adams in his study of Vermont prices, would importantly supplement the data on urban prices.

If national product estimates are built up by the commodity flow method, retail price indexes can be used to deflate the consumer commodity groups and, alternatively, wholesale price indexes can be applied to the estimates at the level of producer values, prior to adjustment for distributive margins.[2] Unless one price index is clearly superior to the other, both methods might be tried and the constant dollar series adopted which seems most reasonable in the light of external checks.

Consumer outlays for services can only be deflated by the appropriate consumer price indexes. The same household account books that will be an important source of service price data may also provide the basis for the service expenditure estimates themselves. Kuznets used the ratios of service to commodity outlays from family budget studies to derive this segment of his national product estimates in the early decades. Possibly data in household accounting records could serve the same purpose.

To deflate new construction expenditures, it would be relatively easy to construct averages of appropriate wage-rates and materials prices, weighted in combinations appropriate to the various types of new construction. The present construction deflator is based in part on this approach. This type of cost index does not reflect productivity increases,

[1] Thomas S. Berry, *Western Prices before 1861*, Harvard University Press, 1943.

[2] See Henry Shavell, "Price Deflators for Consumer Commodities and Capital Equipment, 1929–42," *Survey of Current Business*, May 1943.

but the latter have long been insignificant in building. While advance has been important in heavy construction in recent decades, this was probably not the case in the nineteenth century.

Mrs. Hoover has pointed to the gaps in price data for producers' durable equipment. The Census unit value data and special studies of farm equipment prices and railway equipment prices beginning in 1889 deserve attention.[3] Probably farm equipment manufacturers' records and the records of certain railroads are still available for years before 1889; if so, they might yield valuable data. Further price research is clearly indicated in the equipment field in view of its key role in economic development.

Wholesale price indexes fill the need for inventory deflators; the problem here will be the derivation of measures of net change in current values.

For deflation of net foreign investment (assuming use of the Commerce Department's method), there will soon be available comprehensive indexes of the prices of exports and imports prepared from Customs value and quantity data for the years 1800 to 1860 by Douglass North, and from 1879 forward on a quarterly basis by Robert Lipsey. The National Bureau will probably also sponsor the work necessary to bridge the 1860–79 gap. North and Lipsey have compared their unit value series with domestic wholesale price series for certain commodities. The movements of the two series were so similar, in most cases, that the compiler of a wholesale price index might look to the export or import price data on those commodities for which domestic price data are not available!

The Commerce Department currently uses wholesale price indexes to deflate government purchases of commodities. While government buying prices may parallel the wholesale prices of the same commodities, it would be useful to test this assumption by constructing indexes based on the records of the Army, Navy, and certain civilian agencies.

Finally, in order to deflate the gross national product by industry of origin, we need wholesale price indexes grouped and weighted according to primary product production, and regrouped and reweighted in terms of the intermediate products purchased by each of the industries. This has been done for agriculture by Towne and Rasmussen, following procedures established by the Department of Commerce for the period since 1910.[4]

[3] George K. Holmes, *Course of Prices of Farm Implements and Machinery for a Series of Years*, Dept. of Agriculture, Misc. Series Bulletin 18, 1901; and the reports of the Railroad Presidents' Cost Committees, referred to by William H. Shaw, *Value of Commodity Output since 1869*, National Bureau of Economic Research, 1947.

[4] Marvin W. Towne and Wayne D. Rasmussen, "Gross Farm Product and Investment in the Nineteenth Century" (this volume); also the August 1951 and September 1954 issues of the *Survey of Current Business*.

Once reasonably good economy-wide and industry-wide price deflators have been constructed, the analyst will wish to check the movements of the price series for consistency with related variables in the national accounts. For example: Are the movements of the quotient of average product prices and average factor prices reasonably consistent with movements in productivity ratios? Are relative changes in prices among industries inversely correlated with relative changes in productivity over periods long enough for price changes to tend to approximate changes in unit costs? Are the relative movements of prices at wholesale and at retail consistent with data on distributive margins? When reasonable consistency is achieved in the estimates of prices and related variables, the way is clear for quantitative analysis of the processes of economic change.

Nineteenth century price history opens up vital analytical problems. In contrast to the situation in the twentieth century the trend of prices was down, wartime inflations being succeeded by adjustments that eventually carried prices below prewar levels. What changes in the monetary system and in the pricing policies of firms and of labor organizations account for this divergent experience? Study of nineteenth century price determinants might help in the formulation of policies to achieve greater price flexibility and stability today, although I am not suggesting pragmatic considerations as a prime reason for historical study.

More than twenty years ago F. C. Mills, in an excellent review of the status of price data and price research in the thirties, wrote:

> Finally, we should note the need of non-price series coordinate with our price records. We study price changes for the light they throw on the working attributes of contemporary economic systems. . . . A beginning has been made in the formulation of fruitful hypotheses and the building up of accurate and comparable measurements for the study of economic change. The betterment of price records must go hand in hand with the improvement of measures defining changes in other elements of the economic system.[5]

In the same vein, analysts of nineteenth century price statistics must be regarded as providing building stones for an integrated set of national economic accounts in that period.

[5] Frederick C. Mills, "Price Data and the Problems of Price Research," *Econometrica*, October 1936, p. 309.