The Historical Labor Statistics Project at the University of California

Susan B. Carter
Department of Economics
University of California at Riverside

Roger L. Ransom
Department of History
University of California at Riverside

Richard Sutch
Departments of Economics and History
University of California at Berkeley

The Historical Labor Statistics Project, a research program currently underway at the University of California's Berkeley and Riverside campuses, is intended to create a machine-readable data base of microeconomic data extracted from a selected collection of more than 150 reports published between 1874 and the First World War by more than twenty state bureaus that gathered industrial and labor statistics. The data available in these reports can be broadly classified into one of three categories:

1. Survey data collected from workers canvassed by bureau agents in studies seeking information on occupation, wages, working conditions, living standards, asset ownership, and many other diverse subjects. (Altogether the complete data set would include information from over 100,000 respondents.)
2. Data contained in "special reports" on a variety of topics including the industrial depressions of 1893 and 1907; the health of female college graduates; the character and extent of unemployment; the balance sheets of savings banks and building associations; union membership and strike success; and technology, labor practices, and industrial structure.
3. Survey data collected from firms by state bureaus seeking information on output, employment, hours, wage rates, employment practices, and many other issues. (For several states, consistent information was collected on an annual basis.)

The existence of this rich source of data has been known to cognoscenti for some time. Data of the first type was called to the attention of economic historians by a classic paper of Jeffrey Williamson (1967). However, his call to make further use of these data was not answered until Joan Hannon analyzed a sample collected by the Michigan Bureau of Labor and Industrial Statistics in her dissertation on ethnic discrimination (1978). Since then, data from the state bureaus of industrial and labor statistics have been utilized by a growing number of researchers to examine a variety of questions. Hannon (1982a, 1982b) and Barry Eichengreen and Henry Gemery (1986) have examined ethnic differences in labor markets using Michigan and Iowa data. Eichengreen (1987) and Steven Maddox and Eichengreen (1986) have looked at the impact of unionism in New Hampshire. Roger Ransom and Richard Sutch have used samples from California, Kansas, Maine, and Michigan to study the impact of aging among older workers (1986a, 1990), as well as the pattern of saving and asset accumulation in working-class households (1986b, 1986c, 1989). Eichengreen (1984), Susan Carter (1988), Carter and Peter Philips (1990), and Carter and Elizabeth Savoca (1990a, 1990b, 1990c) have used data from California and Iowa to study issues of gender differences and mobility in the late-nineteenth-century labor market. Robert Whaples and David Buffum (1987) have used a sample of Michigan furniture workers to examine employee discrimination.

Data from surveys of firms by state bureaus are well
known because they were exploited by pioneers in the
creation of macroeconomic data on aggregate output
(Frickey 1942; Jerome 1926), as well as data on employ-
ment, wages, and hours (Berridge 1923; Douglas 1930;
Lebergott 1964; Rees 1961). These data also have been
used to study issues connected with racial and gender dis-
crimination (Philips 1982).

The special reports, which were virtually ignored by
scholars in economic history until recently, are emerging
as an important new source. The work of Alexander Keys-
sar (1986) has drawn attention to the value of the special
investigations of unemployment; Hannon (1984) has ana-
lyzed reports on poor relief; Gerald Friedman (1988) has
studied strike activity; and William Sundstrom (1990) and
Carter and Sutch (1990) have investigated the depression
of 1893.

Despite continuing efforts, the rich volume of data con-
tained in state bureau reports remains unexplored. Few of
these data sets have been machine coded, much remains
entirely unexamined, and even the quantitative data previ-
ously examined remain to be fully exploited. We are now
engaged in a research project designed to explore the
structure and operation of the late-nineteenth-century
labor market. This project will make extensive use of all
three types of data mentioned above. To further our re-
search agenda and, not incidentally, to make available a
valuable source of data to other scholars working on these
and other topics, we propose to take a systematic ap-
proach to identifying, assessing, collecting, and archiving
as much of the state report data as funds, time, and will
permit. This article is intended to give a brief overview of
the data available, suggest some of the many questions in
macroeconomic and microeconomic history to which they
might prove insightful, and describe some of the proce-
dures we propose for collecting, distributing, and archiv-
ing. We wish to emphasize that the project has only begun
and that a major purpose of summarizing our procedures
is to elicit suggestions for the conduct of this work.

THE STATE BUREAU OF LABOR
STATISTICS MOVEMENT

Bright colors mixed and laid by an artist's hand on canvas
might not tell at the close of another century of the work of
our generation. Glowing words of description by gifted
writers might not mean all the interpretation we give it in
our time. But cold, enduring Arabic characters will remain
through the ages to come, as truthful as of old. They are the
fitting and never-changing symbols by which to tell the
story of our present state, so that, when the age we live in
becomes the past of successive generations, the story and
the picture shall be found to exist in all the just proportions
in which it has been set by ourselves. (Wright 1908, 15)[1]

The "cold, enduring Arabic characters" that Carroll
D. Wright spoke of were the economic and social statistics
published in the reports of the U.S. state bureaus of in-

dustrial and labor statistics. No country in the world,
Wright boasted, rivaled the United States in the quantity
or quality of its statistics. Indeed, at the time of his ad-
dress in 1908, the state bureaus had produced about 700
volumes of data constituting a "vast storehouse of social
and industrial information," most of which, Wright felt,
were "of an excellent character" (Wright 1908, 11).

The collection of these data to a large extent was due to
the leadership and energy of Wright himself. He first be-
came involved in 1873 when he was appointed Commis-
sioner of Labor Statistics in Massachusetts after the first
commissioner's alleged pro-labor bias threatened the dis-
continuation of the state's Bureau of Statistics of Labor.
Wright had had no formal training as a statistician, but
his strong belief in the power of impartial facts to enhance
the common weal, together with his tact, honesty, and
enterprise, made him a perfect fit for the position. In the
nineteenth century, as Patricia Cline Cohen has argued,
"numbers were celebrated":

[T]hey were genuinely useful, . . . they were thought to dis-
cipline the mind, . . . they marked the progress of the era,
and . . . they were reputedly objective and precise and hence
tantamount to truth. Numerical facts trounced opinions
and were supposed to foster community consensus, because
all thinking people would naturally agree if they possessed
total and accurate information. (Cohen 1982, 225)

" 'Know thyself' is an injunction which should be ap-
plied to communities as well as to individuals, and it is
only through rigid, impartial, and fearless investigations
that any community can know itself in many directions,"
claimed Wright (1901, 3). In his efforts to increase knowl-
edge about communities, Wright championed the ad-
ministration of carefully designed questionnaires to large,
representative samples of ordinary men and women and
the publication of the detailed, quantitative responses. In
the Massachusetts Bureau of Statistics of Labor's (MBSL)
Sixth Annual Report (1875), for example, Wright pub-
lished the full responses to his questionnaire about the
condition of working men in Massachusetts for each of
the 397 respondents interviewed. As Williamson, one of
the first modern scholars to make use of this data, ob-
served,

Never before had such a sample been collected on such a
scale, with such detailed economic data, and with such care
with regards to its representativeness of the population.
With the appearance of the *Sixth Annual Report*, public
criticism of the MBSL died down and Wright became a leg-
end in his own time. (Williamson 1967, 103)

The subsequent success of the Massachusetts bureau
led to the creation of similar agencies in other states (table
1). Wright became the informal leader of the state labor
statistics movement. There were annual meetings of repre-
sentatives of the various state bureaus, and a concerted at-
tempt was made to establish operating principles and
quality control, standardize methodology, and deal with
practical and political obstacles to their work. As a conse-

TABLE 1
State Bureaus of Labor Statistics, March 1902

State	Year of first report	Number of reports through 1901
Massachusetts	1870	44
Pennsylvania	1873	28
Ohio	1877	24
New Jersey	1878	23
Indiana	1879	14
Missouri	1879	23
Illinois	1879–80	21
New York	1883	18
Michigan	1883	18
California	1883–84	9
Wisconsin	1883–84	9
Iowa	1884–85	9
Maryland	1884–85	13
Kansas	1885	16
Connecticut	1885	17
Maine	1887	14
Rhode Island	1887	11
North Carolina	1887	14
Colorado	1887–88	9
Minnesota	1887–88	7
Nebraska	1887–88	7
West Virginia	1889–90	6
North Dakota	1889–90	6
Tennessee	1891	10
New Hampshire	1893	6
Montana	1893	7
Utah	1894	1
Washington	1897–98	2
Virginia	1898	3

Source: U.S. Bureau of Labor, *Index of All Reports Issued by Bureaus of Labor Statistics in the United States Prior to March 1, 1902.* (Washington, D.C.: Government Printing Office, 1902).

TABLE 2
Worker Surveys

State	Title and number of report year of survey	Coverage
	Data sets already collected	
California	Fifth biennial, 1892	3,493 wage-workers
Indiana	Fifth biennial, 1893	500 working women
Iowa	First biennial, 1884	347 teachers
Kansas	First annual, 1884	337 wage-workers
Kansas	Second annual, 1885	471 wage-workers
Kansas	Third annual, 1887	444 wage-workers
Maine	First annual, 1887	108 wage-workers
Maine	Second annual, 1888	118 wage-workers
Maine	Fifth annual, 1890	1,084 wage-workers
Michigan	Sixth annual, 1887	719 clay, slate, and stone workers
Michigan	Seventh annual, 1888	5,419 furniture workers
Michigan	Eighth annual, 1889	3,793 agricultural implements and iron workers[a]
Michigan	Twelfth annual, 1894	5,600 farm laborers 2,300 domestics 935 farmers
Michigan	Thirteenth annual, 1895	1,250 self-employed hack drivers 2,000 employed hack drivers 1,865 street car workers
Missouri	Fourteenth annual, 1891	259 wage-workers
New Jersey	Twenty-sixth annual, 1902	938 working children
Ohio	Third annual, 1878	230 working men
Wisconsin	Seventh biennial, 1895	555 farmers
Total already collected		32,765
	Data sets proposed for collection	
California	Third biennial, 1887	430 working women
Colorado	First biennial, 1887	138 wage-workers
Colorado	Seventh biennial, 1899	733 wage-workers
Connecticut	Second annual, 1885	69 families
Connecticut	Fourth annual, 1887	693 farmers
Illinois	First biennial, 1880	529 wage-workers
Illinois	Second biennial, 1881	1,191 families
Illinois	Third biennial, 1883	2,129 families
Iowa	First biennial, 1884	751 wage-earners
Iowa	Sixth biennial, 1894	3,334 wage-workers
Iowa	Ninth biennial, 1898	268 wage-workers
Iowa	Tenth biennial, 1901	395 wage-workers
Iowa	Eleventh biennial, 1903	333 wage-workers
Iowa	Twelfth biennial, 1904	407 wage-workers
Iowa	Thirteenth biennial, 1906	404 wage-workers
Iowa	Fourteenth biennial, 1908	507 wage-workers
Iowa	Fifteenth biennial, 1910	152 wage-workers
Kansas	Fifth annual, 1889	147 wage-workers
Kansas	Tenth annual, 1893	304 wage-workers
Kansas	Eleventh annual, 1894	519 wage-workers
Kansas	Twelfth annual, 1895	539 wage-workers
Kansas	Thirteenth annual, 1896	1,204 wage-workers
Kansas	Fourteenth annual, 1897	361 wage-earners
Kansas	Fifteenth annual, 1898	819 wage-workers
Kansas	Sixteenth annual, 1899	531 wage-workers
Kansas	First biennial, 1901	802 wage-workers
Kansas	Second biennial, 1903	1,081 wage-workers
Kansas	Twenty-second annual, 1906	335 wage-workers
Kansas	Twenty-third annual, 1907	390 wage-workers
Maine	Second annual, 1888	222 working women
Maine	Fourteenth annual, 1899	175 wage-workers

quence, many of the individual state studies were explicitly patterned on one another, asking identically worded questions of their respondents and using the selection and interviewing techniques that had begun to emerge as standard practice.

In 1885, the U.S. Congress established the federal Bureau of Labor Statistics, and Wright was appointed the first U.S. commissioner of labor. This new position facilitated his work with the superintendents of the state bureaus in promoting data collection. As a result, there was an outpouring of statistical surveys of working conditions undertaken through house-to-house surveys of workers from 1885 to about 1897. The U.S. Bureau of Labor conducted its own massive survey of workers in 1889 and 1890 (U.S. Commissioner of Labor 1890, 1891). This family budget survey covered 8,544 working-class families—6,809 households in the United States and 1,735 in five European countries. In keeping with their commitment to present impartial "facts," the bureau followed a pattern of publishing each individual's exact responses to the questions asked. Beyond a simple tabulation of the re-

TABLE 2
Continued

State	Title and number of report year of survey	Coverage
	Data sets proposed for collection	
Massachusetts	Sixth annual, 1874	397 families
Michigan	Sixth annual, 1887	2,472 copper miners
Michigan	Eighth annual, 1889	4,918 agricultural implements and iron workers[b]
Michigan	Tenth annual, 1892	9,527 construction workers
Michigan	Eleventh annual, 1893	9,204 railroad workers
Michigan	Fourteenth annual, 1896	4,000 vehicle workers
Minnesota	Twelfth biennial, 1909	212 families
Missouri	First annual, 1878	475 wage-workers
Missouri	Second annual, 1879	147 wage-workers
Missouri	Eleventh annual, 1888	130 miners
Missouri	Twelfth annual, 1889	303 wage-workers
Missouri	Thirteenth annual, 1890	422 car shop workers
Missouri	Fifteenth Annual, 1893	1,467 miners and workers
Nebraska	Second biennial, 1889	721 unskilled laborers
New Hampshire	First annual, 1892	436 wage-workers
New Hampshire	Second annual, 1893	711 wage-workers
New Hampshire	First biennial, 1895	1,815 shoe workers
New Jersey	Second annual, 1878	383 wage-workers
New Jersey	Sixth annual, 1882	550 wage-workers
New Jersey	Seventh annual, 1883	1,300 wage-workers
New Jersey	Eighth annual, 1884	608 wage-workers
New Jersey	Ninth annual, 1885	376 families
New Jersey	Eleventh annual, 1887	680 working men
		225 working women
North Carolina	First annual, 1886	311 heads of families
Ohio	First annual, 1876	145 working men
Ohio	Second annual, 1877	101 working men
Ohio	Fourth annual, 1879	286 working men
Ohio	Fifth annual, 1880	340 working men
Ohio	Sixth annual, 1881	299 working men
Ohio	Seventh annual, 1882	1,013 working men
Ohio	Eighth annual, 1883	242 working men
Ohio	Ninth annual, 1884	353 working men
Ohio	Tenth annual, 1885	355 working men
Ohio	Seventeenth annual, 1892	8,671 farmers
Ohio	Twenty-fifth annual, 1900	6,920 working women
Ohio	Twenty-sixth annual, 1901	2,386 working women
Oklahoma	First annual, 1908	242 wage-workers
Oklahoma	Second annual, 1909	92 wage-workers
Oklahoma	Third annual, 1910	320 families
Pennsylvania	Seventh annual, 1878	498 wage-workers
Pennsylvania	Ninth annual, 1880	167 wage-workers
Pennsylvania	Twenty-second annual, 1893	1,378 construction workers
Rhode Island	Second annual, 1888	600 wage-workers
Rhode Island	Third annual, 1889	1,400 wage-workers
Rhode Island	Sixth annual, 1892	573 artisans
Rhode Island	Eighth annual, 1894	2,299 textile operatives
Washington	Third biennial, 1901	100 wage-workers
Washington	Fourth biennial, 1903	100 wage-workers
West Virginia	Second biennial, 1891	100 miners
		136 wage-workers
Wisconsin	Third biennial, 1887	671 wage-workers
Wisconsin	Seventh biennial, 1895	1,488 mechanics
	Total proposed for collection	92,957
	Total collected and proposed	125,722

[a]City of Detroit only.
[b]Outside the city of Detroit.

sults, no systematic analysis of the data was undertaken. Wright's conviction that the purpose of the statistics was to promote public discussion led him to oppose the condensation of the data into summary statistics because these required academic knowledge on the part of the readers in order to interpret them successfully.

Wright went to considerable trouble to point out the "value and influence" that the collection and presentation of statistics on living conditions of the working classes had on public policy. After a quarter century of effort, he proudly pointed to a number of areas where, from his own experience, the statistical data that he collected had influenced legislation: improvement in housing conditions in tenement areas of Boston, enactment of child labor laws, fire and safety regulations for the workplace, legislation for a ten-hour day in Massachusetts, reduction in abuses from the "truck-store" system of payment-in-script, and establishment of state-run employment agencies (Wright 1901, 3–6).

Not all contemporaries agreed with Wright's favorable assessment. Some criticized these "unsummarized and undigested statistics" for requiring "the time of Methuselah" and "the patience of Job" to decipher (Wright 1908, 11). Yet it is precisely the unprocessed nature of the raw published statistics that makes these studies so valuable to the modern researcher. Today it is possible, at reasonable cost, to transform the raw published data into machine-readable form and use computer-assisted statistical and data-handling techniques to address a variety of exciting historical questions. As Wright predicted, the cold, enduring Arabic numbers (transformed into machine-readable format) make it possible a century later to tell the story of Wright's time.

WORKER SURVEYS

Table 2 lists 103 working and living condition surveys with promising data reported on the individual level that we have identified in our search of the state reports. The list is incomplete because our compilation is still in progress. All of the state reports published before 1900 are available in a microfiche format in the Government Documents Division of the Doe Library at the University of California at Berkeley, and many of the published volumes are stored as part of the university's documents collection. Other volumes are available with varying degrees of ease through interlibrary loans from state archives and historical societies. A very helpful annotated guide to some of these reports was published by the U.S. Department of Agriculture (Williams and Zimmerman 1935). The U.S. Bureau of Labor published two indexes to the state reports. The first, published in 1893, covers all reports published up to 1892 and also contains brief summaries of the contents of each volume; the second, issued in 1902, covers reports up to 1901.

TABLE 3
Guide to Coverage in Selected Worker Surveys

State	Calif.[a]	Ind.[b]	Kan.[c]	Maine[d]	Mich.[e]	Mich.[f]	N.J.[g]	Ohio[h]	Wis.[i]
Survey year	1892	1893	1887	1890	1888	1895	1902	1878	1895
Number of respondents	3,493	500	444	1,084	5,419	3,250	938	230	555
Personal and family									
Age	x	x	x	x	x	x	x	—	—
Men and women	x	—	—	x	x	—	x	—	—
Men only	—	—	x	—	x	x	—	x	x
Women only	—	x	—	—	—	—	—	—	—
Children only	—	—	—	—	—	—	x	—	—
Heads of household	—	—	—	—	—	—	—	—	x
Current residence	—	x	x	x	x	x	x	—	—
Marital status	x	x	—	—	x	x	—	—	x
Household size	—	x	x	x	x	x	—	x	x
Dependents	x	—	—	x	x	x	—	x	—
Children in school	—	—	x	—	x	—	—	—	x
Nativity	x	x	x	x	x	x	—	—	x
Parents' nativity	—	x	—	—	x	—	x	—	—
Years in U.S.	x	—	—	—	—	—	—	—	—
Years in state	x	—	—	—	—	x	—	—	—
Schooling	—	—	—	—	—	—	—	—	—
Father's occupation	—	x	—	—	—	—	x	—	—
Health, accidents	x	x	x	—	—	—	x	—	—
Employment and earnings									
Industry	x	—	—	x	x	x	x	—	x
Occupation	x	x	x	x	x	x	x	x	x
Wage rate	x	x	x	x	x	x	x	x	—
Method of payment	—	—	—	—	—	—	—	x	—
Pay period	x	—	x	—	x	x	—	x	—
Change in wage rate	—	—	x	x	—	x	—	x	—
Hours per day	x	x	x	x	—	—	x	x	—
Yearly earnings	—	x	x	x	—	—	—	x	—

Notes: Survey Year refers to the date in which we estimate the survey was taken. Some reports contain several surveys. Number of observations are approximations in some cases. Only variables appearing in many surveys have been listed; many surveys contain additional information. In the case of some variables—expenditures in particular—data are provided for a subset of the sample only.

[a]California Bureau of Labor Statistics, *Fifth Biennial Report for the Years 1891-1892.* Sacramento: State Office, 1893. Wage-workers.
[b]Indiana Department of Statistics, *Fifth Biennial Report for 1893-94.* Indianapolis: Wm. B. Burford, contractor for state printing and binding, 1894. Working women.
[c]Kansas Bureau of Labor and Industrial Statistics, *Third Annual Report, January 1, 1888.* Topeka: Clifford C. Baker, state printer, 1888. Heads of household.
[d]Maine Bureau of Industrial and Labor Statistics, *Fifth Annual Report, 1891.* Augusta: Burleigh & Flynt, printers to the state, 1892. Mechanics and male and female operatives.

The 103 state reports are listed in table 2 in order of our priority for collection by the Historical Labor Statistics Project. The reports in the first group have already been collected, and documentation is available so that these data sets can be used by interested investigators immediately.[2] The second group includes reports that we feel should be coded and documented. They were chosen by virtue of their quality, size, and regional or topical interest to economic and social historians. We have excluded from table 2 a number of surveys that we believe should have low priority. Some of these sets are very small, and others are flawed by inadequate quality control, apparent bias, or a limited range of data. We again emphasize that these lists are incomplete, and the priorities for collection proposed are preliminary.

Table 3 provides a guide to the topics and coverage of nine of the reports already coded. A guide to the topics and coverage in all 103 reports listed in table 2 and ten-

tatively selected for coding, documentation, and distribution is included in Carter, Ransom, and Sutch (1991). An example of the display of survey results in the original reports is shown in figures 1 and 2, which present the responses of wage workers in the fire clay industry of Michigan and were photocopied from the Michigan Bureau of Labor and Industrial Statistics' *Sixth Annual Report*, published in 1888. To illustrate the type of issues that can be pursued with cross-sectional data of this type, we point to three examples of our own research interests that have made considerable use of the worker surveys.

Example 1: The Impact of Aging on Men in the Late Nineteenth Century

In a series of papers, Ransom and Sutch have compiled new evidence on the labor force participation of older men around the turn of the century (Ransom and Sutch

TABLE 3
continued

State	Calif.[a]	Ind.[b]	Kan.[c]	Maine[d]	Mich.[e]	Mich.[f]	N.J.[g]	Ohio[h]	Wis.[i]
Survey year	1892	1893	1887	1890	1888	1895	1902	1878	1895
Number of respondents	3,493	500	444	1,084	5,419	3,250	938	230	555
Family earnings	—	—	x	x	x	—	—	x	x
Time lost	x	x	x	x	x	x	—	x	—
Cause of time lost	x	x	x	x	x	x	—	—	—
Age began work	x	—	—	—	x	—	x	—	—
Years in present occupation	x	x	—	—	x	—	—	—	x
Years with present employer	x	—	—	—	x	—	—	—	—
Apprenticeship, training	—	—	—	—	—	—	x	—	—
Union membership	x	—	x	x	—	•	—	—	—
Expenditures and savings									
Expenditures	—	—	x	x	x	—	—	x	—
Expenditures by category	—	—	—	x	x	—	—	x	—
Savings this year	—	—	x	x	x	x	—	x	x
Savings in past years	—	—	—	—	—	—	—	—	x
Savings account	—	—	—	—	—	—	—	—	—
Dissavings	—	—	x	x	x	—	—	x	x
Housing and other assets									
Home ownership	x	—	x	x	x	x	—	—	—
Value of home	—	—	—	x	x	—	—	—	—
Mortgage	—	—	—	x	—	x	—	—	—
Mortgage interest rate	—	—	—	x	—	x	—	—	—
Number of rooms	x	—	x	—	—	—	—	—	—
Rent	x	x	x	—	—	x	—	x	—
Benefit society member	x	—	—	—	x	x	—	—	x
Benefits	x	—	—	—	x	x	—	—	—
Insurance	x	—	x	—	—	x	—	—	x
Other assets	—	—	—	—	x	—	—	—	x
Farm statistics	—	—	—	—	—	—	—	—	x

[e]Michigan Bureau of Labor and Industrial Statistics, *Seventh Annual Report, Feburary 1, 1889.* Lansing: Thorp & Godfey, state printers and binders, 1890. Furniture workers.
[f]Michigan Bureau of Labor and Industrial Statistics, *Thirteenth Annual Report, February 1, 1896.* Lansing: Robert Smith & Co., state printers and binders, 1895. Self-employed and employed hack drivers.
[g]New Jersey Bureau of Statistics of Labor and Industries, *Twenty-sixth Annual Report for the Year Ending Oct. 31, 1903.* Trenton: MacCrellish & Quigley, state printer, 1903. Child laborers.
[h]Ohio Bureau of Labor Statistics, *Third Annual Report for 1879.* Columbus: Nevins and Myers, state printers, 1880. Working men.
[i]Wisconsin Bureau of Labor, Census, and Industrial Statistics, *Seventh Biennial Report, 1895-1896.* Madison: Democrat Printing Co., state printer, 1896. Farmers.

1986a, 1988a, 1988b; Ransom, Sutch, and Williamson 1990). Using state labor reports from California, Kansas, Maine, and Michigan, they found that, contrary to the commonly held view that almost all men remained in the labor force until they died, roughly one-third of all men over the age of sixty had retired from the labor force. This finding raises a whole series of questions about the status of older workers and the strategies of families planning for old age in the late-nineteenth-century United States (Ransom and Sutch 1986b, 1989). Other key findings follow:

Workers tended to either retire or move to less demanding occupations as they grew older. Ransom and Sutch's estimates of labor force participation based on census data were confirmed by the very low proportion of older workers revealed by the age distributions in these samples (Ransom and Sutch 1986a, 1989, 1990). The tendency for workers to shift to less demanding jobs can be seen not

only through the age distributions but also through an analysis of the variable "years in occupation" and "years with present employer." Ransom and Sutch's analysis of Michigan furniture workers over the age of forty revealed a clear pattern of downward occupational movement to less skilled jobs (Ransom and Sutch 1986a, 26–27).

Wage rates and total annual earnings rise to a peak and then fall with age. One of the most dramatic findings in the cross-sectional data is the "humped shaped" curve of wage rates plotted against the age of workers (Ransom and Sutch 1986c, 1990). Wages tend to rise sharply among workers under the age of twenty; continue a gradual increase for workers up to their mid-forties, and then begin a decline that accelerates sharply in most cases for workers in their sixties. A similar pattern is evident with regard to total earnings (Ransom and Sutch 1986a, 1986b, 1989, 1990).

Workers "saved" a significant fraction of their income

and were able to accumulate an impressive level of
wealth. An impressive fraction of workers saved in a
given year (or saved in "past years"). Among those re-
porting the amount saved, fraction of income saved was
high. Based on data from the 1889 Maine Bureau of In-
dustrial and Labor Statistics survey, Ransom and Sutch
reported that 70 percent of the workers with families re-
plied affirmatively to the question, "Have you accumu-
lated savings during the past year?" (Ransom and Sutch
1989). Evidence from the Kansas surveys of 1884–87 and
the Michigan surveys of furniture workers taken in 1889
and Detroit iron workers taken in 1891 shows a similar
pattern, as does the evidence in a survey directed by
Wright for the U.S. Bureau of Labor in 1890–91 (U.S.
Commissioner of Labor 1890, 1891). Equally impressive
was the high fraction of workers reporting ownership of
a home, ownership of an insurance policy or bank ac-
count, or membership in a benefit society. A major seg-
ment of the U.S. work force at the turn of the century
was pursuing a systematic strategy of saving and asset ac-
cumulation over the course of a lifetime.[3]

The number of days paid to work declined with age,
and the number of days lost from illness or involuntary
layoffs were higher for older workers than for workers in
their prime. The labor surveys provide data on both the
number of days lost and the cause of lost time. An ex-
amination of this evidence suggests that the retirement of
older workers may not have been entirely voluntary
(Ransom and Sutch 1990). Indeed, a key question posed
by the findings outlined above is whether most retire-
ments were compelled by declining physical productivity,
ill health, and disability or whether they were the result of
saving and planning on the part of individual workers.

Example 2: Occupational and Job Tenures
in the Late Nineteenth Century

Carter and Savoca have used state labor bureau worker
survey data to study occupational and job tenures. Their
most surprising finding is that, contrary to the widely
held view that nineteenth-century job attachment was
"casual" and "impermanent," most periods of em-
ployment were concentrated in spans of lengthy employ-
ment. Their calculations indicate the following:

The typical male industrial worker in the late nineteenth
century could expect to remain with his current employer
for thirteen years and the typical female for six (Carter and
Savoca 1990a, 1990b). These findings challenge the "spot
market" characterization of the nineteenth-century labor
market in which workers were fired or quit in response to
small shifts in labor demand or supply.

Industrial and personal characteristics associated with
stable job attachment in the modern labor market exerted
similar influences in the late nineteenth century. Charac-
teristics such as high capital-labor ratios, marriage, and
home ownership were strongly correlated with job tenure

in both periods (Carter and Savoca 1990a). This finding
challenges the widespread impression that resignations,
layoffs, and dismissals in nineteenth-century manufac-
turing were governed largely by the capricious and arbi-
trary behavior of workers and employers.

Occupational attachment was stable for both males
and females. Males are estimated to have remained in
their occupations for about twenty-one years and females
nine. Even teachers had relatively lengthy careers, with
males teaching for an average of thirteen years and fe-
males ten (Carter and Savoca 1990c). These findings
challenge the view that nineteenth-century occupational
investments (i.e., time investments in improving work
skills) were of a very general problem-solving variety,
which permitted movement across a wide range of tasks.
For whatever reasons, workers did not change occupa-
tions frequently.

The estimates of expected occupational tenure show
that careers did not last a lifetime. The average male
worker in the surveys investigated had already spent 12.8
years in his current occupation and was predicted to re-
main for another 6.7 years, leaving on average at age
thirty-nine (Carter and Savoca 1990b). These findings are
consistent with Ransom and Sutch's conclusions that
workers tended to either retire or move to less demanding
occupations as they grew older.

The differences in occupational and job tenures be-
tween men and women were small. Although women's
occupational and job tenures were indeed briefer than
men's, Carter and Savoca (1990b) found that the differ-
ences were too small to have warranted differences in
training given training costs, wage differentials, and re-
turns to occupation-specific training in the period. This
result challenges the view that gender differences in oc-
cupational distribution and wage rates about the turn of
the century were the result of profit- and income-maxi-
mizing choices in the context of differences in expected
firm and occupational tenures.

Together these findings raise additional questions
about employment contracts and wage determination.
What accounts for the measured employment stability?
What were the implications of employment stability for
wage determination, the gender and ethnic composition
of the work force, and technological change? Can
lengthy employment spells be reconciled with the brief
life expectancy of nineteenth-century firms? What ac-
counted for gender differences in occupations and
wages? What does seem clear is that many conventional
beliefs about employment relations and labor market dy-
namics need to be reevaluated in light of these findings
from data in the state labor surveys.

Example 3: Homogeneity of Unemployment

In modern labor markets, the burden of unemploy-
ment falls on a relatively small proportion of the labor

FIGURE 1
Sample Page
Survey of Workers in the Michigan Fire Clay Industry, 1887

Source: Michigan Bureau of Labor and Industrial Statistics, *Sixth Annual Report, February 1, 1889* [sic]. Lansing: Thorp & Godfrey, State Printers and Binders, 1888.

force who are out of work for a long time (Clark and Summers 1979, 14; Murphy and Topel 1987, 13). It has been suggested by historians, however, that in the late nineteenth century, "the burden of joblessness was widely shared among the working people" (Keyssar 1986, 77). In particular, although there were differences in unemployment rates across industries, "the joblessness that occurred in any particular trade or industry was fairly evenly distributed among men who were born in the United States and men who were born abroad" (Keyssar 1986, 82; Sutch 1988; Margo 1990a; Margo 1990b; Hatton and Williamson 1990a; Hatton and Williamson 1990b). It has also been asserted that the unemployment rates experienced by young and old, men and women, and whites and blacks were all about the same during the major depressions of the late nineteenth century (Keyssar 1986; Margo 1990a; Margo 1990b).[4] Since the heterogeneity of unemployment in the modern era is commonly attributed to labor market structure, the homogeneity of turn-of-the-century unemployment appears to imply that such structure was absent.

An alternative explanation is suggested by the findings of Carter and Sutch (1990) on the importance of suspensions of operations. They found that employers did favor some workers over others but that their scope for express-

ing their preferences in terms of differential unemployment during depressions was limited by an all-or-none pattern of work force reduction. Some cross-sectional evidence consistent with this interpretation was collected by the Maine Bureau of Industrial and Labor Statistics (1892) and analyzed by Ransom and Sutch (1989). Illness, as expected, increases with age. The Maine survey gives the number of days lost due to sickness, unemployment, and personal reasons. It is interesting that the amount of time lost due to layoffs also rises with age. Perhaps this is an indication of some type of age discrimination by employers. Whether such discrimination was induced by the reduced likelihood that an older worker would quit and seek alternative employment if laid off, by reluctance to hire older workers, or by a paternal regard by employers for the welfare of younger men with small children at home is a subject that awaits further investigation.

The fact that voluntary absences from work increase with age even as the worker experiences an increase in the number of days lost for involuntary reasons and a decline in the wage rate may be significant. If a worker wanted to resist the fall in income implied by these two factors that were out of his control, he might be expected to decrease voluntary absences. This is not what the data shows. Instead, workers not only do not resist the decline in in-

FIGURE 2
Sample Page
Survey of Workers in the Michigan Fire Clay Industry, 1887, continued.

Source: Michigan Bureau of Labor and Industrial Statistics, *Sixth Annual Report, February 1, 1889* [sic]. Lansing: Thorp & Godfrey, State Printers and Binders, 1888.

come, they actively accelerate it, perhaps because they have been successful in accumulating assets. If so, they could maintain consumption levels despite their declining income by reducing their rate of saving or even by dissaving if necessary. The data on workers' budgets contained in the various state reports can, we believe, help gain insight into these and other issues.

SPECIAL REPORTS

In addition to surveying workers and firms, state labor bureaus conducted a variety of special investigations. Industrial and mining accidents; apprenticeships; property assessments; banks; benefit and insurance associations; building and loan associations; child labor; company stores; factory inspection; homes, mortgages, and mortgage interest payments of wage laborers; labor laws; liquor; lost time; pauperism; wage payment practices; prices; railroads; strikes; unemployment; and unions were among the major topics of study. The indexes to state reports prepared by the U.S. Bureau of Labor (1893, 1902) provide full references to these investigations. Table 4 lists some of these special investigations that are of particular relevance to our studies of labor market structure. Here we illustrate possible uses of one special survey, the Connecticut investigation of the industrial depression of 1893.

An Example: The 1893 Depression in Connecticut

In 1894, the Connecticut Bureau of Labor Statistics conducted an investigation of the effects of the industrial depression on the state's economy. While acknowledging that "[s]ome results of such a depression cannot be told in figures even approximately," it felt that "after a minute inquiry and a searching examination of accounts," effects such as "loss in working time, loss in wages and loss in product could be accurately tabulated" (Connecticut Bureau of Labor Statistics 1894, 167). Monthly reports from manufacturers for the fifteen months between 1 June 1893 and 31 August 1894 were requested. Because accuracy was desired, "the inquiry was limited to some 500 establishments which, because of their size, were presumed to have accounts which would facilitate the filling out of the schedule" (Connecticut Bureau of Labor Statistics 1894, 168). The 378 firms that submitted usable responses accounted for three-fourths of the state's industries and employed almost half of the state's industrial workers (Connecticut Bureau of Labor Statistics 1894, 169).

To establish a basis of comparison for depression conditions, the bureau requested information on the average number of employees, average monthly wage payments, and value of production in 1892. It also requested the

TABLE 4
Special Surveys

State	Title and number of report year of survey	Subject
Data sets already collected		
Connecticut	Tenth annual, 1894	1893 depression
Wisconsin	Fifth biennial, 1891–92	Factory inspection[a]
Wisconsin	Eighth biennial, 1897–98	Factory inspection[a]
Data sets proposed for collection		
Connecticut	Eleventh annual, 1895	1893 depression
Maine	Eighth annual, 1895	1893 depression
Massachusetts	Eighteenth annual, 1887	Unemployment
Massachusetts	Seventh annual, 1893	Manufacturing
Massachusetts	Eighth annual, 1893	Manufacturing
Massachusetts	Ninth annual, 1894	Manufacturing
New Jersey	Eighteenth annual, 1895	1893 depression
New Jersey	Nineteenth annual, 1896	1893 depression
New Jersey	Thirty-first annual, 1908	1907 depression
New York	Eleventh annual, 1894	1893 depression
Ohio	Eighteenth annual, 1895	Manufacturing
Pennsylvania	Twenty-fourth annual, 1896	Manufacturing
Wisconsin	Fifth biennial, 1891–92	Factory inspection[b]
Wisconsin	Sixth biennial, 1893–94	Factory inspection
Wisconsin	Eighth biennial, 1897–98	Factory inspection[b]

[a]Milwaukee
[b]Wisconsin except Milwaukee.

time or hours worked under "what may be termed an ideal condition of full time" (Connecticut Bureau of Labor Statistics 1894, 183). For each of the fifteen months between 1 June 1893 and 31 August 1894, information on the number of days entirely shut down, weekly hours of labor, average number employed, total paid in wages, and value of output was obtained. Firms were also asked to report changes in wage rates between 1 June 1893 and 31 August 1894. Table 5 presents mean values of key variables.

Production: The production index shown in table 5 indicates that the large Connecticut firms included in the survey experienced an extremely severe depression in 1893. The 21.2 percent drop in the nominal value of output is larger than the 19 percent drop in industrial production at the national level although smaller than the collapse of industrial production between 1920 and 1921 and between 1929 and 1933.[5]

Unemployment, Days, and Hours: The 21.2 percent drop in the nominal value of output was accompanied by substantial reductions in labor input. Employment fell by over 16 percent, and the number of days worked by those who retained their jobs was reduced by more than 13 percent. The number of hours in the work day declined by approximately 4 percent. As a consequence,

total hours worked fell 30 percent. One surprise here is that these Connecticut firms relied to an extraordinary extent on hours reductions as a method of reducing labor input (Connecticut Bureau of Labor Statistics 1894, 186). Hours per worker fell a dramatic 17.4 percent while the number of workers fell only 16.3 percent. This greater reliance on hours reductions rather than layoffs is the opposite of today's pattern. In post-World War II recessions, the reduction in average hours is considerably smaller than that in employment (Lilien and Hall 1986, 1006).

Suspensions of Operations: Virtually all of the reduction in work time was accomplished by suspensions of operations—plant closings that idled the entire work force. The heavy reliance on suspensions of operations may be the most distinctive institutional feature of turn-of-the-century personnel practices. Carter and Sutch (1990) were unable to find data on suspensions of operations in the modern era, but casual empiricism suggests that the routine use of complete plant shutdowns to effect reductions in labor inputs is now rare. Even when modern plants institute massive layoffs, they retain some workers.

Short Run Increasing Returns to Labor: In modern labor markets, productivity is pro-cyclical; it declines when output falls. This phenomenon is often attributed

TABLE 5
Percentage Change in Average Output, Employment,
Days, Hours and Wages; Connecticut Investigation
of the 1893 Depression

	Percentage change
Total hours	− 30.0
Employment	− 16.3
Days per worker	− 13.2
Hours per day per worker	− 4.0
Total wages	− 23.5
Wages per worker	− 9.6
Wages per hour	+ 11.5
Output	− 21.2
Output per worker	− 5.7
Output per worker hour	+ 16.5
Percentage of firms instituting	
General wage reductions	33.3
Partial wage reductions	17.5
Both general and partial reductions	1.6
General wage increases	0.5
Partial wage increases	3.2

Source: Connecticut Bureau of Labor Statistics, *Tenth Annual Report for the Year Ending November 30, 1894.*
Note: The percentages were calculated for all firms reporting each variable and refer to unweighted means across firms in the percentage change in average monthly value between 1892 and the period June 1893 through August 1894. Partial wage reductions and wage increases mean that not all employees were affected.

to "labor hoarding" during contractions (Hultgren 1960; Fair 1969). Carter and Sutch (1990) found labor productivity moving countercyclically in the 1890s. The nominal value of output fell by 21.2 percent while total worker hours fell 30 percent. Since prices were falling, real output per worker hour increased by even more than the 16.5 percent indicated in table 5. Robert Layer also reports an increase in output per worker during nineteenth-century depressions in the cotton textile firms that he studied (Layer 1955, 29). Furthermore, in both the Connecticut sample and Layer's data, the productivity increase in depressions is matched by an increase in average hourly earnings. In the Connecticut data, wage payments fell less than total hours so that the average nominal hourly wage rose 11.5 percent. Since prices were falling, the average real hourly wage increased even more. An examination of the data on average hourly wages, levels of employment, and hours per worker as a percentage of 1892 across industries reveals that the nominal average hourly wage rate was above its predepression value when employment and hours per worker were below. The average hourly wage fell when employment and hours began to recover.

Layer suggests that the increases in productivity and in the average hourly wage were due to the differential reten-

tion of skilled, highly paid workers (Layer 1955, 29), an explanation also offered by a New Jersey manufacturer who was interviewed during an investigation of the effects of the 1893 depression in that state and who commented on the "peculiar result that when business is at the lowest point, the average wages paid per hour is apt to be highest" (New Jersey Bureau of Statistics of Labor and Industries 1895, 11–12). Thus, the countercyclical behavior of productivity and of the average hourly wage in the late nineteenth century also seems to indicate "hoarding" of a sort—the preferential treatment of skilled workers.

Wage Rate Cuts: A key macroeconomic question is whether conditions of deficient aggregate demand provoke aggressive wage rate cutting. There was certainly an excess supply of labor in Connecticut during 1893. Table 5 shows that total hours fell 30 percent from the prosperous previous year. It also shows that just over half of all firms cut wage rates. Yet these wage rate cuts do not appear to have been designed to clear the market.

Despite enormous differences across firms in the magnitude of their output reductions between peak and trough, the overwhelming majority of firms that cut wages issued across-the-board cuts of exactly 10 percent. Sundstrom reports a similar pattern in Ohio data from this same period (Sundstrom 1990). See also DeCanio and Mokyr (1977); Goldin and Margo (1989); and Hanes (1990). Given general price declines in 1893 of far greater than 10 percent, real wages rose even for those workers who experienced a money wage cut. We are currently engaged in an effort to better understand this behavior and to develop modern evidence that will help us to put these findings into perspective.

TIME SERIES

Perhaps best known to modern researchers are the consistent annual data on output, employment, wages, and days in operation collected by state bureaus of labor statistics. These data form the basis for Rees's annual average hourly wage series for the period from 1890 to 1914 (Rees 1961) and for Stanley Lebergott's interpolating series for manufacturing employment between census benchmarks from 1890 through 1909 (Lebergott 1964, 436). Rees (1961, appendix A) provides a useful state-by-state guide to these data for the years 1890 through 1914.

Although these data have received considerable attention, they were last analyzed using hand methods of tabulation and calculation, before the widespread availability of high-speed computers and computer-assisted data management and statistical analysis. Few of these data sets have been machine coded. Computers permit us to supplement and extend the pioneering work that leads to the creation of the existing series in ways that were far too expensive to be practicable in the past. For example, the widely used series on employment and wages are all based on data from the small number of states that collected

consistent information for a long run of years. Rees's annual hourly wage series for the years 1889 through 1914 is based on data from just three states: Massachusetts, New Jersey, and Pennsylvania (Rees 1961, 31). We may be able to develop ways to make more systematic use of data from the many other states that were collecting comparable information in this period. Computers also may permit us to better exploit the rich industry and demographic detail in these reports. Finally, because our analysis of the Connecticut investigation of the depression of 1893 suggested a large role was played by suspensions of operation as a method of reducing labor inputs, we may want to rethink some of the inferences of earlier studies. As an illustration, we offer the following comments on long-term changes in the level and variability of unemployment.

An Example: Long-Term Changes in the Level and Variability of Unemployment

To be unemployed according to the modern measure, a person has to be out of work each day of the survey week. Time lost due to reductions in hours per day or days per week are ignored. The historical unemployment measure is conceptually similar. Unemployment prior to 1940 is measured as the difference between the labor force and the "average number of persons employed," a term that refers to the number of names on firms' payrolls and that does not vary with days worked per week or hours per day.

Because the bulk of time lost in the modern labor market occurs in spells that last for a week or more, the variation in measured unemployment is a good proxy for the variation in total time lost. But in the 1890s, the Connecticut data suggest that unemployment spells of a week or more accounted for less than half of all lost time. Thus, the modern unemployment concept misses much of the total time lost in the early period. The consistent application of the modern concept may distort our perception of long-term changes in the level and variability of unemployment. State bureau of labor statistics data can be used to develop annual estimates of weekly hours to complement existing annual estimates of employment. The hours series can be used to chart the relative importance of hours and employment fluctuations over time and date the appearance of the modern pattern.

DATA DISTRIBUTION

The data sets described in this report are, for the most part, relatively small. They can be distributed on floppy disks and manipulated within the confines of any reasonably sized desktop computer. Copies of the data sets currently being collected are maintained at the Laboratory for Historical Research at the University of California at Riverside. When the collection process is completed, a complete set of all data collected from the surveys will be

deposited with the Inter-University Consortium for Social and Political Research at the University of Michigan at Ann Arbor. Information regarding availability of data sets can be obtained by writing to the addresses below:

Professor Susan B. Carter
Department of Economics
University of California
Riverside, CA 92521

or

Professor Roger L. Ransom
Laboratory for Historical Research
University of California
Riverside, CA 92521

or

Professor Richard Sutch
Institute for Business and Economic Research
University of California
Berkeley, CA 94720

NOTES

1. We have deleted a few phrases from Wright's original prose to enhance its readability.
2. Plans for archiving and distributing the data are discussed at the end of this article.
3. In addition to our own research findings, Michael Haines (1979, 1985) and Haines and Allen Goodman (1990) have found similar patterns of saving and asset accumulation using the U.S. Bureau of Labor survey data.
4. Robert Margo's analysis of 1910 census data produces results that are consistent with Keyssar's except that he finds blacks experiencing higher levels of unemployment than whites.
5. The real value of industrial production by month is from Miron and Romer 1990. Price deflators are from the U.S. Bureau of the Census 1966, series B62.

REFERENCES

Berridge, W. A. 1923. What the present statistics of employment show. In *Business cycles and unemployment*, National Bureau of Economic Research, 43-66. New York: National Bureau of Economic Research.
Carter, S. B. 1988. The changing importance of lifetime jobs, 1892-1978. *Industrial Relations* 27:287-300.

Carter, S. B., and P. Philips. 1990. Continuous-process technologies and the gender gap in manufacturing wages. In *New directions in labor markets and human resource policies*, edited by K. Abraham and R. McKersie, 213–40. Cambridge: MIT Press.

Carter, S. B., R. L. Ransom, and R. Sutch. 1991. Micro-level data sets suitable for investigation of social and economic issues extracted from reports of the state bureaus of labor statistics circa 1890. *Working Paper Series on Historical Factors in Long Run Growth*. Cambridge, Mass.: National Bureau of Economic Research.

Carter, S. B., and E. Savoca. 1990a. Labor mobility and lengthy jobs in nineteenth-century America. *Journal of Economic History* 50: 1–16.

———. 1990b. Learning and earning in late nineteenth-century America: Gender difference and the role of expected job and career attachment. *Explorations in Economic History*. Forthcoming.

———. 1990c. The "teaching procession"? Another look at teacher tenure, 1845-1925. Smith College, Department of Economics Working Paper no. 90-2. Northampton, Mass.

Carter, S. B., and R. Sutch. 1990. The labour market in the 1890s: Evidence from Connecticut manufacturing. In *Unemployment and underemployment in historical perspective*, edited by E. Aerts and B. Eichengreen, 15–24. Leuven: Leuven University Press.

Clark, K., and L. Summers. 1979. Labor market dynamics and unemployment: A reconsideration. *Brookings Papers on Economic Activity* 1:13–60.

Cohen, P. C. 1982. *A calculating people: The spread of numeracy in early America*. Chicago: University of Chicago Press.

Connecticut Bureau of Labor Statistics. 1894. *Tenth annual report for the year ending November 30, 1894*. Meriden: Press of the Journal.

DeCanio, S., and J. Mokyr. 1977. Inflation and the wage lag during the American Civil War. *Explorations in Economic History* 14: 311–36.

Douglas, P. 1930. *Real wages in the United States 1890-1926*. Boston: Houghton Mifflin.

Eichengreen, B. 1984. Experience and the male-female earnings gap in the 1890s. *Journal of Economic History* 44:822–34.

———. 1987. The impact of late nineteenth-century unions on labor earnings and hours: Iowa in 1894, *Industrial and Labor Relations Review* 40:501–15.

Eichengreen, B., and H. Gemery. 1986. The earnings of skilled and unskilled immigrants at the end of the 19th century. *Journal of Economic History* 44:411–54.

Fair, R. C. 1969. *The short-run demand for workers and hours*. Amsterdam: North-Holland Publishing.

Frickey, E. 1942. *Economic fluctuations in the United States*. New York: Russell Sage.

Friedman, G. 1988. Strike success and union ideology: The United States and France, 1880-1914. *Journal of Economic History* 48: 1–26.

Goldin, C., and R. Margo. 1989. Wages, prices, and labor markets before the Civil War. National Bureau of Economic Research working paper no. 3198. Cambridge, Mass.

Haines, M. R. 1979. Industrial work and the family life cycle, 1889–1890. *Research in Economic History* 4:289–356.

———. 1985. The life cycle, savings, and demographic adaptation: Some historical evidence for the United States and Europe. In *Gender and the life course* edited by A. S. Rossi, 43–63. New York: Aldine Press.

Haines, M. R., and A. C. Goodman. 1990. A home of one's own: Aging and homeownership in the United States in the late nineteenth and early twentieth centuries. Paper presented at the Bowdoin-Breckinridge Conference on the Historical Demography of Aging in York, Maine.

Hanes, C. 1990. Explaining a decrease in cyclical wage flexibility in the late nineteenth century. Paper presented at the Thirtieth Annual Cliometrics Conference, 18-20 May, at Allerton House, University of Illinois.

Hannon, J. U. 1978. The immigrant worker in the promised land: Human capital and ethnic discrimination in the Michigan labor market, 1889-1890. Ph.D. Diss., Department of Economics, University of Wisconsin.

———. 1982a. Ethnic discrimination in a 19th-century mining district: Michigan copper mines, 1888. *Explorations in Economic History* 19:28-50.

———. 1982b. City size and ethnic discrimination: Michigan agricultural implements and iron working industries, 1890. *Journal of Economic History* 42:825–46.

———. 1984. Poverty in the antebellum Northeast: The view from New York state's poor relief rolls. *Journal of Economic History* 44: 1007–32.

Hatton, T., and J. G. Williamson. 1990a. Unemployment in the 1890s: Microeconomic evidence from Michigan. In *Unemployment and underemployment in historical perspective*, edited by E. Aerts and B. Eichengreen, 25–35. Leuven: Leuven University Press.

———. 1990b. Unemployment, implicit contracts, and compensating wage differentials: Michigan in the 1890s. Paper presented at the Thirtieth Annual Cliometrics Conference, 18–20 May, at Allerton House, University of Illinois.

Hultgren, T. 1960. Changes in labor cost during cycles in production and business. National Bureau of Economic Research, *Occasional Paper* 74.

Jerome, H. 1926. *Migration and business cycles*. New York: National Bureau of Economic Research.

Keyssar, A. 1986. *Out of work: The first century of unemployment in Massachusetts*. Cambridge: Cambridge University Press.

Layer, R. G. 1955. *Earnings of cotton mill operatives, 1825-1914*. Cambridge: Harvard University Press.

Lebergott, S. 1964. *Manpower and economic growth*. New York: McGraw-Hill.

Lilien, D. M., and R. E. Hall. 1986. Cyclical fluctuations in the labor market. In *Handbook of labor economics*, vol. 2, edited by O. Ashenfelter and R. Layard, 1001–35. London: Elsevier Press.

Maddox, S., and B. Eichengreen. 1986. The impact of unions in the 1890s: The case of New Hampshire shoe workers. Harvard University, unpublished manuscript.

Maine Bureau of Industrial and Labor Statistics. 1892. *Fifth annual report 1891*. Augusta: Burleigh and Flynt.

Margo, R. 1990a. The incidence and duration of unemployment: Some long-term comparisons. *Economic Letters* 32:217–20.

———. 1990b. Unemployment in 1910: Some preliminary findings. In *Unemployment and underemployment in historical perspective*, edited by E. Aerts and B. Eichengreen, 51–60. Leuven: Leuven University Press.

Massachusetts Bureau of Statistics of Labor. 1875. *Sixth annual report of the bureau of labor statistics*. Massachusetts Public document no. 31. Boston: Rand, Abery, and Co., Printers to the Commonwealth.

Miron, J. A., and C. D. Romer. 1990. A new monthly index of industrial production, 1884–1940. *Journal of Economic History* 50: 321–38.

Murphy, K. M., and R. Topel. 1987. The evolution of unemployment in the United States: 1968-1985. *NBER macroeconomics annual 1987*, 11–116. Cambridge: MIT Press.

New Jersey Bureau of Statistics of Labor and Industries. 1895. An inquiry regarding the industrial depression of 1893–94. *Seventeenth annual report for the year ending October 31st 1894*, 3–77. Trenton: State Printer.

Philips, P. 1982. Gender-based wage differentials in Pennsylvania and New Jersey manufacturing, 1900-1950. *Journal of Economic History* 42:181–6.

Ransom, R. L., and R. Sutch. 1986a. The labor of older Americans: Retirement on and off the job, 1870-1937. *Journal of Economic History* 46:1–30.

———. 1986b. The life-cycle transition: A preliminary report on wealth-holding in America. In *Income and wealth distribution in historical perspective*, vol. 1. Utrecht: Rijksuniversiteit te Utrecht.

———. 1986c. Unequalled thrift: An inquiry into the saving behavior of Americans at the turn of the century. Institute for Business and Economic Research, University of California, Berkeley. Paper presented to the Ninety-ninth Annual Meeting of the American Economic Association, New Orleans.

———. 1988a. The trend in the rate of labor force participation of older men, 1870-1930: A reply to Moen. *Journal of Economic History* 49:170–83.

———. 1988b. The decline of retirement in the years before social security: U.S. retirement patterns, 1870-1940. In *Issues in contemporary retirement*, edited by E. Lazear and R. Ricardo-Campbell,

3-37. Stanford: The Hoover Institution on War, Revolution and Peace.

———. 1989. Two strategies for a more secure old age: Life-cycle saving by late-nineteenth-century American Workers. *Working Paper Series on Historical Factors in Long Run Growth* no. 2. Cambridge: Mass.: National Bureau of Economic Research.

———. 1990. The impact of aging on the employment of men in working-class communities at the end of the nineteenth century. In *The historical demography of aging*, edited by D. Kertzer. Berkeley: University of California Press.

Ransom, R. L., R. Sutch, and S. H. Williamson. 1990. Retirement, past and present. In *Retirement, social security, and the future: How important is it for older workers to stay in the labor force?* edited by A. H. Munnell. Washington, D.C.: National Academy of Social Insurance.

Rees, A. 1961. *Real wages in manufacturing 1890–1914.* National Bureau of Economic Research. Princeton: Princeton University Press.

Sundstrom, W. A. 1990. Was there a golden age of flexible wages? Evidence from Ohio manufacturing, 1892–1910. *Journal of Economic History* 50:309-20.

Sutch, R. 1988. Review of Keyssar. *Journal of Economic History* 48: 215-7.

U.S. Bureau of Labor. 1893. *Third special report of the commissioner of labor.* Analysis and index of all reports issued by bureaus of labor statistics in the United States prior to 1 November 1892. Washington, D.C.: Government Printing Office.

U.S. Bureau of Labor. 1902. *Index of all reports issued by bureaus of labor statistics in the United States prior to March 1, 1902.* Washington, D.C.: Government Printing Office.

U.S. Bureau of the Census. 1966. Long-term economic growth, 1860–1965. Washington, D.C.: Government Printing Office.

U.S. Commissioner of Labor. 1890. *Sixth annual report.* Washington, D.C.: Government Printing Office.

U.S. Commissioner of Labor. 1891. *Seventh annual report.* Washington, D.C.: Government Printing Office.

Whaples, R., and D. Buffum. 1987. Employee-based discrimination in the Michigan furniture industry, 1889. Paper presented at the Cliometrics Sessions, Allied Social Sciences Association Meetings, Chicago.

Williams, F. M., and C. C. Zimmerman. 1935. Studies of family living in the United States and other countries: An analysis of material and method. *United States Department of Agriculture miscellaneous publication no. 223* Washington, D.C.: Government Printing Office.

Williamson, J. G. 1967. Consumer behavior in the nineteenth century: Carroll D. Wright's Massachusetts workers in 1875. *Explorations in Entrepreneurial History*, second series 4:98–135.

Wright, C. D. 1901. The value and influence of labor statistics. In *Monographs on social economics*, edited by C. H. Verell part 2, 1:10, Washington, D.C.: U.S. Department of Labor Exhibit, Pan American Exposition, 1901.

———. 1908. Address of C. D. Wright, President of the American Statistical Association at its annual meeting in Boston, 17 January 1908. *Publications of the American Statistical Association*, 11.