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3 Structural Change in the Farm Labor Force

Contract Labor in Massachusetts Agriculture, 1750–1865

Winifred B. Rothenberg

America's genuinely "peculiar institution" may not have been plantation slavery at all, but free labor on the farms of New England. Varieties of bondage—slavery, serfdom, truck, peonage, the *encomienda,* indentured servitude, the interlinking of forced labor to ill-functioning markets for land and credit, the buying and selling of foreign workers by *padrones, partidaros,* and labor bosses, and the more subtle but no less coercive tyranny of familial production—have characterized agrarian labor systems throughout the world since time immemorial.[1] There is nothing "peculiar" about them. But an agricul-

Even after many years of doing so, it is still a pleasure to acknowledge the assistance of the staffs of the Pocumtuck Valley Memorial Association Library at Historic Deerfield, Old Sturbridge Village Library, and the Manuscripts and Archives Collection of Baker Library at the Harvard Business School. This study owes most to Ellen Rothenberg, Stanley Engerman, and Kenneth Sokoloff; to Jack Larkin, Chief Historian of the Research Department at Old Sturbridge Village, whose generous willingness to share the data base for his study of farm laborers on the Ward family farm is deeply appreciated; to David Garman and Oliver Hart whose insights have proved most helpful; and to Claudia Goldin who, in honoring Robert Fogel, has—repeatedly—stretched my grasp beyond my reach.

1. On the tyranny of familial production in traditional societies, see J. C. Caldwell, "The Mechanisms of Demographic Change in Historical Perspective," *Population Studies,* 35 (March 1981), pp. 5–27. On the tyranny of familial production in the United States, see William N. Parker, "Agriculture," in Lance E. Davis, Richard A. Easterlin, and William N. Parker, eds., *American Economic Growth: An Economist's History of the United States* (New York, 1972), especially p. 395. On bound labor on the American frontier, see Howard Lamar, "From Bondage to Contract: Ethnic Labor in the American West, 1600–1890," in Steven Hahn and Jonathan Prude, eds., *The Countryside in the Age of Capitalist Transformation: Essays in the Social History of Rural America* (Chapel Hill, 1985), pp. 293–324; and William S. Hallagan, "Labor Contracting in Turn-of-the-Century California Agriculture," *Journal of Economic History,* 40 (Dec. 1980), pp. 757–76. On forms of interlinked labor, credit, and tenurial contracts in developing economies, see Hans P. Binswanger and Mark R. Rosenzweig, eds., *Contractual Arrangements, Employment, and Wages in Rural Labor Markets in Asia* (New Haven, 1984). On truck, see Rosemary E. Ommer, ed., *Merchant Credit and Labour Strategies in Historical Perspective* (Fredericton, New Brunswick, 1990).

tural labor force, unconstrained and free to move, may well be a New England innovation.[2]

In an earlier paper I attempted to understand the developmental role played by the emergence of a market for free labor working by the day on Massachusetts farms between 1750 and 1850.[3] Here I explore the complementary role played by live-in laborers hired on monthly contracts "to work with" (or "to work for") Massachusetts farmers.

The distinction between day labor and contract labor in New England agriculture can be traced to the distinction made in English feudal law between free and unfree tenants, a difference that apparently had less to do with the tenure on which the land was held and more to do with what was called the certainty of the work. If the tenants must work at the will of the lord—if "when they go to bed on Sunday night they do not know what Monday's work will be: it may be threshing, ditching, carrying; they can not tell"—then they are unfree. "The tenure is unfree, not because the tenant 'holds at the will of the lord,' in the sense of being removable at a moment's notice, but because his services, though in many respects minutely defined by custom, can not be altogether defined without frequent reference to the lord's will."[4]

From the sixteenth to the mid-nineteenth centuries, much of the labor on English farms was done by "servants-in-husbandry" on annual contracts, an important institution which evolved in response, on the one hand, to desperate labor shortages after each visitation of the plague and, on the other, to the increasingly urgent demand for labor on the larger, enclosed, pastoral farms. Servants-in-husbandry were unmarried young people usually between the ages of 15 and 24, the sons and daughters of farmers who had, for a variety of reasons, shed their adolescent children and taken on someone else's. Servants were hired every Michaelmas at job fairs to live with and in the family (that is, as a member of the household) of the master and to do all manner of farm work for twelve months from harvest to harvest. Until the eighteenth century, the wage was set by fiat; thereafter it was set in the open market. The annual contracts, while not always written, were made public, were constrained by custom and law, and were enforceable in the courts.[5]

2. Free, even, to quit in breach of contract without penalty. It is a matter of some significance, I think, that none of the farmers in my sample withheld the wages earned by workers who quit early in breach of contract, although the courts had held that labor service contracts bar recovery in *quantum meruit*. With the solitary exception of *Britton* v. *Turner*, (N.H., 1834), state courts had consistently held that employers had a right at law to withhold wages from laborers who failed to fulfill an express contract, "whether the wages are estimated at a gross sum, or are to be calculated according to a certain rate per week or month, or are payable at certain stipulated times, provided the servant agree for a definite and whole term." The curious thing, then, is why the farmers in my sample did not withhold wages in fact. See Morton J. Horwitz, *The Transformation of American Law, 1780–1860* (Cambridge, Mass., 1977), pp. 332, n. 148, and 186–87.

3. See my "The Emergence of Farm Labor Markets and the Transformation of the Rural Economy: Massachusetts, 1750–1855," *Journal of Economic History*, 48 (Sept. 1988), pp. 537–66.

4. Frederick Pollock and Frederick W. Maitland, *The History of English Law before the Time of Edward I* (1st edn., 1895; 2d edn., 1898; reprinted Cambridge, 1978), vol. 1, p. 371.

5. The 52-week residency in the parish required for a settlement under the English Poor Law deterred servants from running away in breach of contract, but employing farmers were all too

It is likely that most of the early settlers of Massachusetts had had servants-in-husbandry in England and expected to transport the institution to New England, for it has been estimated that nearly three-quarters of the yeomen, nearly one-half of the husbandmen, and nearly a quarter of the tradesmen in early modern England had a live-in laborer.[6] But farm laborers as a class quickly disappeared in Massachusetts. Estimates put the proportion of servants in seventeenth century Essex County at no more than 4 percent, and in Dedham at less than 5 percent, of the farm population.[7] That first generation of settlers faced not only a dearth of live-in help but a "withering" of day labor as well.[8] Farmers breaking a wilderness to grain agriculture could count only on the field labor of their sons or, if sufficiently prosperous, of their tenants.

While Massachusetts farmers may have had little, if any, live-in help in the seventeenth century, farm account books document the appearance of labor contracts by the mid-eighteenth century. Although contract labor was used with increased frequency after 1800, so was day labor. Both forms of labor were used throughout the sample period and, averaged over quinquennia, there is no change in the composition of man-days of labor. Yet there was an increase in the use of contract labor in terms of the number of contract-months hired per farmer. Measuring the magnitude of that increase, which occupies much of the remainder of this study, will prove problematical, but what increase there was directs our attention to the advantages of labor contracts, advantages that to this day continue to make contractual arrangements the dominant mode of organizing agricultural labor throughout the developing world.

The prevalence of labor contracts (in unionized industries, of course, more conspicuously than in agriculture) poses a challenge to conventional labor market theory. Where conventional theory puts current wages at the center of the process, contract markets "tend to insulate contracting parties from short-run external shocks which take current wage rates 'out of competition' in allocating labor resources." Where in conventional theory labor inputs adjust to the market wage in a perpetual and timeless equilibrium process, in contract theory all options that existed ex ante are closed ex post. In sum, where competitive markets are governed by the invisible hand, contract markets are governed by "the invisible handshake."[9]

Several motivations for labor contracts have been identified in the theoretical literature. There is, first, the insurance motive. The theory of contracts

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often able to impose the infamous 51-week contracts that left servants disqualified for a settlement. See Ann Kussmaul, *Servants in Husbandry in Early Modern England* (New York, 1981).

6. Daniel Vickers, "Working the Fields in a Developing Economy: Essex County, Massachusetts, 1630–1675," in Stephen Innes, ed., *Work and Labor in Early America* (Chapel Hill, 1988), p. 55.

7. Ibid., p. 55, n. 13.

8. Ibid., p. 60.

9. See Sherwin Rosen, "Implicit Contracts: A Survey," *Journal of Economic Literature*, 23 (Sept. 1985), pp. 1144–75. The passages quoted appear on pp. 1145 and 1149.

suggests that the primary beneficiary of a labor contract is the worker who is assumed to be more risk-averse than the employer. In adjusting output to falling seasonal demand, the employer may be indifferent as to lowering wage rates and keeping employment constant or keeping wage rates constant and laying off workers, but the worker is not. Where both contract and day labor are used, the brunt of periodic layoffs is borne by the day workers, while the contract workers accept a wage below their marginal revenue product and considerably below the spot wage of the day worker in return for employment security for the duration of the contract. Sherwin Rosen calls this bargain struck by the contracting parties, "implicit payments of insurance premiums by workers in favorable states of nature and receipt of indemnities in unfavorable states."[10]

Another motivation concerns the hoarding of labor. If the local supply of labor cannot be counted upon to satisfy peak seasonal demands, the employer may have an incentive to secure "downstream" labor in the off-season, at off-season wages, even if it means hoarding wage labor for many months. As a corollary, the employer-farmer will have an incentive to restructure the farm enterprise so that the labor he is "storing" at considerable expense can be gainfully employed in the off-season. Diversifying the crop mix, home manufacturing, hiring out "my hand" to neighboring farmers, shifting to dairying and animal husbandry which use labor throughout the year, can all be understood as responses to the need to provide year-round employment for workers on long-term contracts.[11]

It is difficult to understand the ubiquity of long-term wage and tenancy contracts in labor-surplus economies where the marginal productivity of family labor approaches zero and the probability of recruiting harvest workers on the spot is very high. Yet the major incidence of agricultural labor contracts today is in just such economies.[12] It would appear that contracts under these conditions disguise as labor recruitment strategies what are primarily arrangements for workers to obtain access to credit and land in the absence of well-functioning credit and land markets. The interlinking of labor, land, and credit transactions is facilitated by the sunk investment the parties have made in the relationship, that is, by what Oliver Hart and Bengt Holmstrom have called a

10. Ibid., p. 1145.

11. See, for example, Ralph V. Anderson and Robert E. Gallman, "Slaves as Fixed Capital: Slave Labor and Southern Economic Development," *Journal of American History*, 64 (June 1977), pp. 24–46.

Of course, not all farmers will be willing to absorb the costs of hoarding labor, together with the related costs of restructuring the farm calendar. They would be particularly reluctant if "worker opportunism," that is, quitting in breach of contract, is not heavily penalized by custom as well as by law. "Contracts break down if workers accept insurance payments opportunistically in bad times and renege on premium payments by skipping out in good times" (Rosen, "Implicit Contracts," p. 1170). It is for this reason that I attach considerable importance to the finding in farm account books that wages in *quantum meruit* were in fact paid on incomplete contracts.

12. See Binswanger and Rosenzweig, *Contractual Arrangements*.

"lock-in effect."[13] The long-term contract acts in lieu of collateral for the debtor borrowing against his wages and acts as a screening device for the creditor.[14]

Finally, long-term contracts are, above all else, a means by which both sides seek to save on the costs of time spent in negotiation, in matching, in monitoring and enforcement, and in search.[15] While it is well known that a wage contract provides less incentive than a land-tenure contract for a worker to perform at maximum effort, the notion of "lock-in" as Hart and Holmstrom use the term—that is, of a relation-specific investment which has a higher value to both parties inside the relationship than outside it—provides what incentives there were.

Presumably all these factors played a role in motivating the use of monthly contracts on Massachusetts farms between 1750 and 1865. In my attempt to measure the incidence of farm labor contracts, to assess their relationship to seasonality, to analyze the pattern of seasonal and structural wage differentials, and to raise questions about the segmentation of the farm labor force,

13. Oliver Hart and Bengt Holmstrom, "The Theory of Contracts," in Truman F. Bewley, ed., *Advances in Economic Theory* (New York, 1987). The term "lock-in" as used by Hart and Holmstrom refers to "situations where a small number of parties make investments which are to some extent relationship-specific; that is, once made, they have a much higher value inside the relationship than outside. Given this 'lock-in' effect, each party will have some monopoly power ex post, although there may be plenty of competition ex ante before investments are sunk," p. 72.

Although Hart and Holmstrom did not have farm labor contracts in mind, Hart has suggested in private conversation with the author that among the "investments which are to some extent relationship-specific" (that is, among lock-in situations) may indeed be the commitment a farmer made to a worker who had foregone alternatives, left home and family, and traveled perhaps a considerable distance to move into a quid pro quo relationship where "a considerable amount of time may elapse between the quid and the quo," p. 71.

Clearly, the term lock-in is being used in the theory-of-contract literature in quite a different sense from the way the term has been used by economic historians of the postbellum South where it refers to the intricate web of cause and effect that produced "debt peonage and the power of the merchant to force farmers into overproduction of cotton" (Roger L. Ransom and Richard Sutch, *One Kind of Freedom: The Economic Consequences of Emancipation* [New York, 1977], p. 164).

14. It is in this connection that changes in the quality of the farm labor force after 1830, discussed below, may have been most telling. Monthly workers hired "off the road" had not been screened.

15. "As I have now little or no Hope of recovering Enoch, I mounted for Hopkinton p.m. to hire a man," wrote Ebenezer Parkman on 14 July 1768, after his hired hand quit. He scoured the countryside again the following March and April, riding from Westborough to Hopkinton, Grafton, Mansfield, Brookfield, Paxton, Needham, and Upton in search of a young man to live in and work for the season (Francis B. Walett, ed., *The Diary of Ebenezer Parkman, 1703–1782*, American Antiquarian Society [Worcester, 1974], part 2).

On the other side of the search process is Abner Sanger, a farm laborer from Keene, New Hampshire, who wrote in his journal on Saturday, 1 July 1775, "I go over to Captain Wyman's to see if they want me to work for them and let me take the pay in grain. Mrs. Wyman don't know, so I come home." He returned on Monday "to see if they will take work and let me have some grain. I have to wait until night." When he went back that night he learned that young Isaac Wyman, with whom he often worked, had come down with smallpox. On this occasion Sanger lost two days looking for work; and because he seldom if ever worked by the month, this desperate pattern recurred throughout his life. Abner Sanger's extraordinary journal is now annotated, edited, and published in full by Lois K. Stabler, ed., *Very Poor and of a Lo Make: The Journal of Abner Sanger* (Portsmouth, N.H., 1986).

this study is intended as a contribution to the unfinished task of understanding free labor, America's "peculiar institution."

3.1 The Quantitative Importance of Labor Contracts

The data base for this study is a sample of 692 monthly contracts I have drawn from 36 account books of farmers who used contract labor during the period, giving name of farmer, town of farmer, name of hired "hand," year and month of starting work, duration of contract, wage in dollars per month, and any additional information available including age and town of laborer, sudden quits or terminations, special characteristics of the arrangement, and so on. The sample of workers employed by these 36 farmers is augmented on occasion by a data base of 227 contract workers and 181 day workers hired to work on the Ward farm in Shrewsbury, Massachusetts, between 1787 and 1865.[16]

The first set of questions to address with the data is what they tell us about the quantitative importance of contract labor on Massachusetts farms in the period 1750 to 1865. Was there an increase in the number of farmers hiring contract workers? Did individual farmers increase the number of contract workers they hired per year? Did they attempt to increase the length of the contract term? Is there evidence of a shift, a substitution, away from day labor to monthly live-in labor?

Table 3.1 presents several alternative ways of calculating the incidence of contract labor on Massachusetts farms. Column 1 indicates the number of farm account books that appear in the sample for each five-year period. Column 2 counts the number of individual farmers with one or more contracts in each period. (For example, in the first period, two farmers accounted for the eighteen contracts, totalling 96 man-months; the other four books whose coverage spanned this period used no monthly labor in this quinquennium.) The number of contracts in each quinquennium is given in column 3. But number of contracts is an unreliable indicator of changes in the importance of contract labor for two reasons. First, column 3 is drawn from a sample—see column 1—whose size is itself changing as account books varying in time-span enter and leave the sample. Second, the number of contracts, because it does not acknowledge variations in length of contracts, misrepresents their importance. Twelve one-month contracts will loom large but may have less signifi-

16. The Ward Family Farm Laborers' File, compiled by Holly Izard under the supervision of Jack Larkin, Chief Historian, Research Department, Old Sturbridge Village, was generously made available to me by Mr. Larkin. See his discussion based on these data in "'Labor is the Great Thing in Farming': The Farm Laborers of the Ward Family of Shrewsbury, Massachusetts, 1787–1860," *Proceedings of the American Antiquarian Society,* 99 (1989), pp. 189–226. This same volume of the *Proceedings* contains two additional studies of farm laborers: Ross W. Beales, Jr., "The Reverend Ebenezer Parkman's Farm Workers, Westborough, Massachusetts, 1726–82," pp. 121–49; and Richard B. Lyman, Jr., "'What is Done in My Absence?': Levi Lincoln's Oakham, Massachusetts, Farm Workers, 1807–20," pp. 151–87.

Table 3.1 **The Incidence of Monthly Farm Labor Contracts, 1763 to 1865**

Period	(1) Number of Books	(2) Number of Farmers with Contracts	(3) Number of Contracts Specifying Length	(4) Total Man-Months of Contract Labor	(5) Average Man-Months of Contract Labor: Per Contract (4)/(3)	(6) Per Farmer (4)/(1)	(7) Per Farmer with Contracts (4)/(2)
1763–69	6	2	18	96.0	5.3	16.0	48.0
1770–74	6	5	7	38.2	5.5	6.4	7.6
1775–79	6	3	7	22.2	3.2	3.7	7.4
1780–84	9	5	6	34.5	5.8	3.8	6.9
1785–89	11	4	14	80.2	5.7	7.3	20.1
1790–94	12	8	22	110.0	5.0	9.2	13.8
1795–99	12	6	23	114.5	5.0	9.5	19.1
1800–1804	15	7	34	179.2	5.3	11.9	25.6
1805–09	15	9	53	326.1	6.2	21.7	36.2
1810–14	14	10	69	374.7	5.4	26.8	37.5
1815–19	15	10	36	168.8	4.7	11.3	16.9
1820–24	14	12	63	283.3	4.5	20.2	23.6
1825–29	12	8	36	185.8	5.2	15.5	23.2
1830–34	13	9	38	188.6	5.0	14.5	20.9
1835–39	13	8	29	160.4	5.5	12.3	20.1
1840–44	15	11	47	277.3	5.9	18.5	25.2
1845–49	16	15	58	354.4	6.1	22.2	23.6
1850–54	13	7	34	168.2	4.9	12.9	24.0
1855–59	11	3	8	44.8	5.6	4.1	14.9
1860–65	5	2	15	68.8	4.6	13.8	34.4

Notes: Contracts that extended beyond a calendar year are assigned to the year in which they began. The contracts are drawn from a sample of thirty-six account books for thirty-six farmers, all of whom hired contract labor, but not necessarily in every year covered by their books. Of all the contracts in the sample, six hundred and twenty specified length. Three, dated 1713, 1752, and 1753, are omitted from the table.

Source: Rothenberg sample of farm account books.

cance than one twelve-month contract in terms of the insurance, hoarding, interlinking, screening, and cost-saving motives for hiring labor by the month.

Once the number of man-months under contract in each period is known (column 4), then we can compensate for shifting sample size by calculating man-months per contract (column 5), man-months per account book or per sample farmer (column 6), and man-months per contracting farmer (column 7).

As noted above, not all sample farmers hired contract labor in every five-year period. It is the presence of zero entries in column 6 that accounts for the difference between it and column 7. Both measures are given because Table 3.1 is measuring, in effect, the diffusion of an innovation and, in a diffusion measure, zero entries are relevant.

The finding in column 5 that for one hundred years farm labor contracts, on average, did not lengthen much beyond five months is supported by Table 3.2, a frequency distribution of contracts by length. There is no discernible shift to more frequent use of nine- to twelve-month contracts, no marked increase in the proportion of annual as opposed to seasonal commitments. Between 60 and 75 percent of contracts, depending on decade, ran six months or less.[17] This finding suggests that the motives for long commitments discussed above—particularly the insurance motive, which is closely related in the theoretical literature to the Hart-Holmstrom notion of lock-in—were overwhelmed by other factors, principally by the inexorable seasonality of New England agriculture.[18]

3.2 Contract Labor and the Seasonality of Agricultural Employment

A decade ago, Carville Earle and Ronald Hoffman published a study in which America's early and successful industrialization was attributed to a surplus, not a scarcity, of unskilled labor made cheap by long periods of seasonal layoffs in agriculture.[19] While recent research indicates that there is much to fault in their analysis, it is to be acknowledged for having put the seasonality of agriculture at the very center of a model of American industrial development.[20]

17. Man-months per contract averaged 5.2 across quinquennia, 4.9 when averaged annually.

18. What I am suggesting here is that there is a difference between one long contract and two sequential short contracts. It will be recalled that the theory of labor contracts "is based on the idea that a firm offers its risk-averse workers wage and employment insurance via a long-term contract. . . . If the lock-in effect that is responsible for the long-term relationship in the first place is small, . . . the insurance element of the contract will be put under severe pressure" (Hart and Holmstrom, "Theory of Contracts," pp. 106, 110).

19. Carville Earle and Ronald Hoffman, "The Foundation of the Modern Economy: Agriculture and the Costs of Labor in the United States and England, 1800–60," *American Historical Review*, 85 (Dec. 1980), pp. 1055–94.

20. First, recent research based on harvest wage premia finds considerably less seasonality, not more, in American grain agriculture than in British, a result which undermines the Earle-Hoffman

Table 3.2 **Frequency Distribution of Monthly Contracts by Length in Months, by Decade, 1763 to 1865**

Years	Total Number	Percentage Distribution			
		0 to 3 months	Over 3 to 6 months	Over 6 to 9 months	Over 9 to 12 months
1763–69	18	39%	22%	22%	17%
1770–79	14	43	43	7	7
1780–89	20	40	20	10	30
1790–99	45	36	36	18	11
1800–1809	87	31	30	21	17
1810–19	105	34	36	22	7
1820–29	99	36	34	23	6
1830–39	67	22	43	28	6
1840–49	105	20	46	23	12
1850–65	57	42	33	12	12

Note: Of all the contracts in the sample, 620 specified length. Three, dated 1713, 1752, and 1753, are omitted from the table.

Source: Rothenberg sample of farm account books.

In their recent study, Stanley Engerman and Claudia Goldin estimate the loss of national income due to seasonal unemployment in both agriculture and manufacturing, and therefore the "fillip" added to economic growth late in the nineteenth century as a consequence of "surmounting" seasonality, a process they confirm from the decline of the seasonal wage premium between 1880 and 1900.[21] While the credit for reducing seasonality goes principally to the shift out of agriculture, to structural changes within agriculture (mechanization and changes in crop mix), and to the seasonal migration of workers between sectors whose seasonal demands for labor "meshed," Engerman and

explanation for the relative capital-deepening of American and British industrial technology (David Dollar and Kenneth Sokoloff, "Agricultural Seasonality and the Organization of Manufacturing in Early Industrial Economies: The Contrast Between Britain and the U.S.," Working Paper, University of California at Los Angeles, 1991). Second, seasonally unemployed farm hands in the Midwest, in the very grain-growing regions Earle and Hoffman target, sought jobs not in manufacturing but in logging, teamstering, droving, or moved down-river looking for work as itinerant farm workers. If they could not land one of those jobs, they wintered in town, dissipating all their savings on room and board, or stayed on a farm all winter, even for no pay, but with free room and board. See David E. Schob, *Hired Hands and Plowboys: Farm Labor in the Midwest, 1815–60* (Urbana, 1975), pp. 255–56. Lastly, the Earle-Hoffman story depends on the degree to which there was sufficient "meshing" between the seasonal patterns of agriculture and those of manufacturing in the early stages of industrial development. A recent study of seasonality in the late nineteenth century concludes, "After weighing all the evidence, we believe [seasonal unemployment] was not reduced by a movement of laborers across sectors having seasons that meshed" (Stanley Engerman and Claudia Goldin, "Seasonality in Nineteenth Century Labor Markets," NBER Historical Factors in Long-Run Growth Working Paper no. 20 [Jan. 1991], p. 21). There is likely to have been even less meshing in the early years of the century.

21. Engerman and Goldin, "Seasonality in Nineteenth Century Labor Markets," p. 3.

Goldin acknowledge that annual labor contracts may have played a role in diminishing seasonal layoffs within agriculture by 1900.[22]

To posit some relationship between the diffusion of long-term labor contracts and reduced seasonality in agricultural employment is not to posit a direction of causation. Long-term (and off-season) contracts may have been a response to output shifts which lengthened the crop year. Or strategies to lengthen the crop year may have been a response to conditions in the labor market (heightened risk-aversion, for example) which favored long-term and off-season contracts. Or, both the extended use of contracts and the shift in output mix may have been the result of some third factor, say, the growth and spread of markets. While the choice among these causal scenarios is beyond the scope of this paper, it raises three empirical questions that can be addressed with the data presented here. Did the length of labor contracts increase over time to provide more off-season employment? Did the frequency of off-season (winter) contracts, regardless of their length, increase over time? Did farmers alter their crop mix to produce outputs that lengthened the crop year?

It has already been remarked that man-months per contract did not lengthen over time (Table 3.1, col. 5) nor did the frequency of annual contracts increase over time (Table 3.2). There are 77 nine- to twelve-month contracts in my sample—over 12 percent of the 620 contracts in which length was specified—but that number failed to increase over a period in which, as will be discussed below, contract workers accounted for a far larger proportion of man-days of hired farm labor than did day workers.

But even short-term monthly contracts can have worked to smooth seasonal discontinuities in agricultural employment if it can be shown that an increasing proportion of them began in or extended into the winter months. Overall, more than 24 percent of the man-months under contract were for winter work.[23] The number of man-months of off-season (winter) work increased markedly from 21 in the 1760s to 151 in the 1840s, but as a percentage of total man-months there is no evidence of a rising time-trend (see Table 3.3).

Table 3.4, a calendar of farm activities drawn from several unusually detailed farm diaries, daybooks, and account books serves to identify those tasks reserved for the winter months of November through March. The hewing, drawing, and scoring of timber, and the chopping, cutting, and carting of wood took up so much of every winter day that these tasks alone might have

22. "About 25 percent of all nonfamily farm workers in 1900 were unemployed sometime during the year and . . . most of these workers experienced 3 to 4 months of unemployment. Whether or not many of the 75 percent who did not report unemployment during the year were involved in a meshing of the sectors through migration, depends on the proportion of farm laborers who found yearly employment in agriculture. Reliable sources indicate that about 25 to 35 percent of all farm laborers were hired on annual contract, although some additional fraction may have found yearly employment in the agricultural sector on monthly, seasonal, and daily bases" (Engerman and Goldin, "Seasonality in Nineteenth Century Labor Markets," pp. 20–21).

23. "Winter" is defined here as the five months from November through March, so 24 percent of the man-months under contract were for 42 percent of the months.

Table 3.3 Winter Work on Monthly Contract, 1763 to 1865

Date	(1) Number of Man-Months of Winter Work	(2) Total Man-Months Worked	(1)/(2) Winter Months Worked as a percentage of Total Man-Months Worked
1763–69	21 months	96 months	22%
1770–79	11	60	18
1780–89	37	115	33
1790–99	64	147	44
1800–1809	143	500	29
1810–19	104	544	19
1820–29	82	477	17
1830–39	66	349	19
1840–49	151	636	24
1850–59	72	213	34
1860–65	22	69	31
Total	777	3,210	24

Note: Winter is defined as November through March.
Source: Rothenberg sample of farm account books.

kept a hired hand fully occupied. Market trips were sometimes left until winter because sledding loads of produce or livestock on snow and ice was much faster than hauling it in wagons over rutted or muddy roads. Threshing was typically done in the winter: 100 bushels of small grains (wheat, rye, oats, and barley), flailed at the rate of 5 bushels a day, would have occupied one man full time for nearly a month, and several of the farmers sampled produced considerably more than 100 bushels of small grains.[24] Corn did not suffer, as did the small grains and hays, from being left late in the field and could be harvested, cut, stacked, and husked in winter. The first snow each winter was believed to impart special nutrients to the soil and that, presumably, accounts for the many instances of plowing in December. And there were always hogs to butcher, sugar maples to tap, brooms to make, fields to manure, cider to press, and winter rye and wheat to sow.

While the incidence of long-term and off-season contracts did not increase, there was a marked shift in the composition of output which worked to extend the crop year. Plant species cannot, of course, be "deseasonalized." They

24. "New England farmers hailed mainly from England and Scotland and brought with them the strong preference for flailing that dominated pre-mechanical threshing systems throughout the British Isles. . . . The slower and more individualistic flailing technique suited regional needs and became a common task carried out during the long New England winters" (J. Sanford Rikoon, *Threshing in the Midwest, 1820–1940* [Bloomington, Ind., 1988], p. 2). The estimate of 5 bushels a day appears on p. 7. Outputs of up to 400 bushels of small grains are reported for some of my sample farmers in U.S. Census Office, Seventh Census (Manuscript), Massachusetts, 1850, Productions of Agriculture.

Table 3.4 **A Calendar of Farm Work**

Farm Chore	January	February	March	April	May	June	July	August	September	October	November	December
Altering animals				x	x							
Berrying								x				
Birthing calves, lambs, piglets	x	x	x	x								
Breaking up soil					x							
Bringing in cattle for winter									x	x		
Burning over/clearing new land						x		x				
Butchering	x	x	x	x			x		x	x	x	x
Carding wool	x											
Carting hay to markets		x	x	x			x		x	x	x	x
Carting wheat to markets								x				
Carting/spreading dung				x	x	x	x			x	x	x
Chopping wood	x	x	x	x		x					x	x
Cutting ice	x										x	x
Cutting & hanging tobacco								x	x			
Destroy caterpillars					x							
Digging carrots, turnips, etc.											x	
Digging potatoes		x							x	x	x	
Digging stones				x							x	x
Drawing logs to sawmill	x	x	x								x	x
Dressing flax	x											
Gathering poultry & turkey eggs			x									
Getting in stalks and rowen				x					x	x		
Grafting fruit trees				x	x				x			

Harrowing tillage ground				x	x	x			x	x		x
Harvesting corn, beans							x		x	x	x	x
Haying					x		x	x	x	x		
Hewing timber/drawing logs	x		x	x	x					x	x	x
Highway/road work		x	x	x	x	x				x	x	
Hilling/half-hilling corn			x	x		x	x					
Hoeing corn, potatoes, beans				x	x	x	x					
Husking, shelling corn	x								x	x	x	
Make brooms from broomcorn	x											
Making cider	x							x	x	x	x	
Mending dams, walls, fences				x	x			x	x	x	x	
Milling wheat												x
Mowing bushes				x		x		x	x			
Mowing hay meadow						x	x	x	x	x		
Picking hops									x			
Plant broomcorn, cranberries					x							
Plant cabbages, sweet corn, squash				x								
Plant peas, beets, carrots, parsnips				x								
Plant watermelon, cucumbers					x							
Planting corn				x	x							
Planting potatoes, beans, etc.					x							
Planting tobacco						x						
Plowing tillage, meadow, garden				x	x	x	x	x	x	x	x	x
Pruning, trimming fruit trees				x								
Pulling bark for tanning						x						

(*continued*)

Table 3.4 (continued)

Farm Chore	January	February	March	April	May	June	July	August	September	October	November	December
Reaping/cradling oats, rye, wheat			x		x		x	x	x			
Shaking/picking apple trees									x	x		
Shearing sheep					x	x						
Shoemaking		x										
Shoot wild geese											x	
Shoot wild pigeons			x									
Sledding wood	x	x	x								x	x
Sowing clover seed			x	x		x		x				
Sowing flaxseed				x								
Sowing oats				x	x							
Sowing rye (winter & summer)					x	x		x	x	x		
Sowing wheat (winter & summer)				x				x	x			x
Stable and fatten cattle												x
Stripping tobacco	x									x		
Take calves from cows			x									
Taking cattle to outpastures				x	x	x						
Tapping maple trees		x	x									
Threshing barley, oats, rye	x	x	x					x	x	x	x	x
Washing sheep				x		x						
Winnowing grains									x			

Sources: Account and Day Books of William Hosmer of Westfield, Julian Robbins of Deerfield, David Hoyt of Deerfield, and Harrison Howard of North Bridgewater.

carry their seasonality in their genetic codes: corn matures in 2,000 growing-degree-days, and no reorganization of labor on the farm will alter that.[25] But in the interest of distributing labor inputs and farm income more evenly across the year, the plant mix can be diversified. An important example was the cultivation of broomcorn in the Connecticut River Valley. The home manufacture of brooms for urban markets not only linked farmers to industrial out-work (as palm-leaf braiding linked their wives), but provided remunerative (and very labor-intensive) winter work for males.[26]

When the broomcorn bonanza faded, tobacco took its place in the valley. As early as September 1738, and hardly aware that it was a harbinger of momentous things to come, Ebenezer Parkman noted in his diary a shipment of 500 hogsheads of tobacco being sent down river en route to the West Indies. In 1850 Massachusetts farmers were growing 138,000 pounds of the stuff and, by 1860, 3.2 million pounds. Shade-grown tobacco (for cigar wrappers) had become the region's major agricultural staple, cultivated specifically for the New York market, and remained so for a hundred years. What makes tobacco singularly important for a study of farm labor is that its cultivation, picking, smoke-drying, leaf selection, and packing are highly labor- intensive. Given the heavy labor requirements of the crop, the case has been made that its success is inextricably linked to the creation of a "permanent agricultural proletariat" in Massachusetts by the mid-nineteenth century.[27]

The making of brooms and the packing of tobacco provided off-season employment, but their growing seasons competed for labor with all other crops grown in the regular season. On the other hand, the double-cropping of rye and (to a lesser extent) of wheat allowed cultivation to be spread across the year: the winter crop was sown in August and September (one farmer even sowed Black Sea wheat in December) and was brought in in March and April; the spring crop was sown in May and was brought in in July. Grass seed, usually sown in the spring, could just as well be sown in August, as one farmer noted, just after haying.

In addition, with the expansion and integration of markets, New England farm families were expanding their traditional diet of baked beans, cheese, rye-'n-injun bread, Indian pudding, potatoes, salt pork, salt beef, and cider,

25. Growing-degree-days are the cumulative number of degrees Fahrenheit above the "base temperature" (which is the temperature at which a crop begins to grow). Corn begins to grow at 50 degrees F. To calculate the number of summer days it takes for corn to mature, divide 2,000 by the difference between the actual summer temperature and 50 degrees. The enormous effort devoted to corn hybridization has increased yields (over 400 percent between 1930 and 1980!) and pest resistance, but has not affected corn's "seasonality." See Jack Ralph Kloppenburg, Jr., *First the Seed: The Political Economy of Plant Biotechnology, 1492–2000* (New York, 1988), pp. 5, 120, 168.

26. Broomcorn cultivation apparently required two to three times as much labor as corn (Percy W. Bidwell and John I. Falconer, *History of Agriculture in the Northern United States, 1620–1860* [New York, 1941, reprint], p. 245).

27. On tobacco cultivation in the Connecticut River Valley, see Christopher Clark, *The Roots of Rural Capitalism: Western Massachusetts, 1780–1860* (Ithaca, 1990), pp. 295–304.

by growing and eating and marketing poultry, winter wheat, winter rye, fluid milk, fresh butter, green herbs, celery, rutabagas, beets, winter squashes, pumpkins, mangel wurtzels, carrots, parsnips, turnips, cabbages, onions, tomatoes, asparagus, string beans, green peas; peaches, pears, rhubarb, strawberries, cherries, damson plums, quinces, cranberries, wine grapes; salmon, smelts, alewives, clams, haddock, shad, and mackerel. The cultivation of some of these crops did expand the growing season: turnips could be planted in August and pulled in November, asparagus was picked in May, cranberries in September, apples in October.[28]

The increased emphasis on dairy products alone—on fluid milk and butter for nearby urban markets, and on cheese for local cheese factories—meant that more cows were wintered, fattened, kept in milk for most of the year, and stall-fed, a year-round commitment of labor time. So commonplace that it was rarely mentioned in farm account books, milking was nonetheless "the most time-consuming chore."[29] It is still not clear to me who did the milking on Massachusetts farms—wives and daughters, or sons and hired hands—but the heaviest demands dairying made upon hired labor must have been in activities other than milking. These non-milking jobs included cleaning stalls and barns, washing milk cans, delivering milk, and, most of all, in restructuring farm space—mending fences, year-round stabling and stall-feeding of cattle, plowing and seeding and cultivating meadow, upgrading pasture, growing and preparing better feeds, collecting and spreading dung, and so on.[30]

Despite a variety of techniques for mitigating seasonality, its persistence can be read in the persistence of seasonal wage differentials written, on occasion, into annual contracts. In 1771, Joseph Barnard of Deerfield agreed to pay Daniel Rider 24s a month ($4) from January to mid-March, 36s a month ($6) from April to October, and 24s ($4) a month from December to March. In 1788, John Hill's contract with David Hoyt of Deerfield fixed his monthly

28. See Sarah McMahon, "A Comfortable Subsistence: The Changing Composition of Diet in Rural New England, 1620–1840," *William & Mary Quarterly,* 3rd series, 42 (Jan. 1985), pp. 28–65; "Laying Foods By: Gender, Dietary Decisions, and the Technology of Food Preservation in New England Households, 1750–1850" (manuscript, Bowdoin College, 1989); and "'All Things in Their Proper Season': Seasonal Rhythms of Diet in Nineteenth Century New England," *Agricultural History,* 63 (Spring 1989), pp. 130–51.

29. Jeremy Atack and Fred Bateman, *To Their Own Soil: Agriculture in the Antebellum North* (Ames, Iowa, 1987), p. 153.

30. See Fred Bateman, "Labor Inputs and Productivity in American Dairy Agriculture, 1850–1910," *Journal of Economic History,* 29 (June 1969), pp. 206–29. There is some question about gender roles in dairy farming. Bidwell and Falconer quote the following passage from a tract published by the Western Reserve Historical Society: "Except in a Yankee family, no man or boy could be induced to milk the cows, it being regarded as woman's work. But wherever a New Englander was found he and the boys did the 'pailing' of the cows" (*History of Agriculture,* p. 163). On the other hand, I have found only two references in Massachusetts farm account books to men milking, but it may be the case that "chores," of which milking was one, were sufficiently taken for granted not to be entered in account books. Schob quotes *The Prairie Farmer,* "If the hands had worked hard and well [at harvesting] they were not expected to milk the cows prior to dinner" (*Hired Hands and Plowboys,* p. 93). But this suggests that men in the Midwest *did* do the milking.

wages at $11.67 in spring and summer, $6.67 in fall, and $5 in winter. James Bean, Jr., worked for Samuel Plumer of Epping, New Hampshire, for $10 a month from April to December of 1805 and for $6 a month from December to the following April. William Till worked for Charles Phelps, Jr., of Hadley for $6 a month between January and April of 1811, and $11.50 a month from May to November. William Rice worked a year for Phelps in 1814 for $14 a month from April to November, $10 a month from November to January, $12 a month from January to March. In Plymouth, Michael Jacobs in 1847 agreed to pay Henry Barns $8 for the month of October and $6 for each of the following five winter months. William Dowd, who worked faithfully for William Odiorne of Billerica twelve months a year from 1848 to 1853, was paid $14 a month from April to November and $8 a month from December to March.

Long-term contracts like these, in which seasonal wage differentials were written in, appear to have been rare: 90 percent of the 77 nine- to twelve-month contracts in my sample stipulated a flat monthly rate.[31] But it is clear that some of the most interesting issues raised by monthly contracts are to be found in the structure of wage differentials.

3.3 Wage Differentials Between Contract and Day Labor

The structure of day wages in antebellum Massachusetts agriculture was complex and rested, I have argued elsewhere, upon stratification by task.[32] The connection between task and season in farming is so intimate that it may be difficult to disentangle them, but that there is a distinction worth making between them is seen by comparing July/August day wages for non-harvest work with July/August day wages for harvest work (that is, mowing, haying, and reaping). Holding season constant in this way, wages for harvest work were on average 30 percent higher.[33] Overlaying the season- and task-specific structure of farm wages was yet a third pattern: the differentials between day

31. But the seasonal differential is implicit in the flat monthly rate. Workers earned a wage below their marginal revenue product (the cost of employment insurance) in season and above it (the indemnity) off-season.

Engerman and Goldin assume that the flat monthly wage is a weighted average of the seasonal wage and the off-season wage. Assuming the season to be six months, then "$M_a = .5M_s + .5M_{ns}$, where M_a is the average monthly wage on an annual contract, M_s is the average monthly wage for seasonal labor, and M_{ns} is the implicit average monthly wage during the off season" ("Seasonality in Nineteenth Century Labor Markets," p. 7 and table 2, part B).

From the seasonal premia expressly written into annual contracts, it is clear that farmers often thought in terms of three seasons, not two, the length of which varied from season to season and from farmer to farmer.

32. "The Emergence of Farm Labor Markets."

33. A further illustration of the need to distinguish between season and task concerns wages for the month of June. June is of course a summer month, but the dominant tasks done in June were all low-paying tasks—hoeing, half-hilling, weeding, and picking corn. For the purpose of calculating the harvest premium, to include June with July and August would bias the differential downward.

wages and monthly per diem wages. It is to this that we now turn our attention.

That the per diem wage of workers on monthly contracts was considerably below the daily wage of day workers is well known and much—though not all—of the gap is easily explained. Since as a rule contract workers lived with the farm family, it was understood that they received part of their wages in room, board, washing, mending (and, on occasion, clothing, boots, militia training days and election days off, and the use of a horse for a visit home), while day workers "found" for themselves.[34] To make day wages and live-in wages comparable, researchers have valued the income in kind of contract workers at approximately 50 percent of their money wages.[35]

But multiplying monthly wages by a factor of 1.5, as did Larkin, hardly closes the gap between contract and day wages. The actual differential between (non-harvest) day wages and monthly per diems was far larger—on average 80 percent (see Table 3.6, col. 4, below)—suggesting that more than the imputed cost of room and board separated the per day wages of day labor and contract labor. Tables 3.5 and 3.6 will suggest that part of the unexplained differential is a seasonal premium, part a harvest premium—neither of which is fully captured by monthly wages—and part reflects the working of a dual labor market in Massachusetts agriculture.

Table 3.5 aggregates to the level of decadal averages two sets of wage data I have collected from farm account books: monthly per diems (that is, monthly wages divided by twenty-six working days per month) from the sample of labor contracts, and nearly 3,200 day wages from my previous study of day labor. Of the monthly contracts there were 553, over the period 1764 to 1860, that were fully specified, that is, that gave the monthly wage,

34. Schob gives this staggering description of a day's food consumed by hired hands on a midwestern farm: "For Breakfast—Coffee or tea, with cream and sugar, just as much as is desired. Fried bacon, and in the season, eggs always. Cold beef or hash, or perhaps fish, and often fresh meat. Irish or sweet potatoes, good butter and plenty of it; cheese, ditto; pickles, stewed dried fruit, light and white flour bread, cornbread, or hot cakes, hot biscuit, often pies or cakes. For Dinner—Coffee, sweet milk, or sour, or buttermilk, as may be preferred. Boiled pork, beef, potatoes, turnips, cabbages, beets, &c. White loaf bread and butter, cheese, pickles, stewed fruit, and almost always pie or pastry. Supper—The cold meats and vegetables from dinner, or perhaps a hot dish of meats or fish, or some broiled chickens, and coffee or tea, of course, with bread, as before, to which add a little 'tea cake'. At each meal, all the condiments and provocatives of appetite, such as mustard, catchup vinegar, pepper, salt, pickles, &c, are usually on the table. During harvest time, a lunch in the forenoon and afternoon, of cold meats or fowls, with fresh wheaten loaves or biscuits, cakes or pies, and often accompanied by hot coffee, with cream and sugar, always as a matter of course." Quoted from the *American Agriculturist*, 1849, in Schob, *Hired Hands and Plowboys*, p. 97.

35. In the database for his study of laborers on the Ward Farm, Larkin multiplies monthly wages by a factor of 1.5 to account for the imputed value of room and board. Earle and Hoffman adjusted monthly live-in wages by a factor of 1.33 to 1.45 ("Foundation of the Modern Economy," p. 1069). The Department of Agriculture series on farm wages per month, 1866–1927, showed a slight but steady decline in the differential between with and without board, from 54 percent to 41 percent and averaging 44 percent over the period. U.S. Department of Labor, *History of Wages in the United States From Colonial Times to 1928*, Bureau of Labor Statistics Bulletin No. 499 (Washington, D. C., Oct. 1929), Table D–2, p. 227.

year, starting month, and duration of the contract.[36] The monthly per diems were entered for each month for the duration of each contract.[37] Day wages for mowing, reaping, and haying were averaged and entered as harvest wages in July and August of the year in which they were observed. Non-harvest day wages are the day wages for all other tasks and were entered in the month and year in which they were observed.

In Table 3.6 the monthly data in Table 3.5 are aggregated, and the ratios are calculated that define the overlying pattern of wage differentials. The ratio of (non-harvest) day wages to monthly per diems (which might be called the day-labor premium) averaged 1.8; the ratio of harvest day wages to non-harvest day wages (the harvest premium) averaged 1.3; the ratio of harvest day wages to monthly per diems (which might be called the spot-market premium) averaged 2.3. And the seasonal premium, the ratio of peak-month wages to trough-month wages, averaged 1.3 for contract workers and 1.6 for (non-harvest) day labor. Of all these, the only differential that narrowed during the antebellum period was the seasonal differential for contract workers, from 1.5 in the 1770s to 1.1 in the 1840s.

If decomposing the differential into its several components explains its magnitude, it does not explain its persistence. Why did wage differentials so lavishly favoring day workers persist for ten decades? Was it more difficult to recruit day workers than contract workers? Did day workers, residing off the farm, have to be compensated for travel costs? For the costs of job search? For leaving their own farms? For bearing the brunt of seasonal unemployment? Or does the persistence of the wage differential owe something to group characteristics distinguishing the populations of day and monthly workers and relevant to their relative productivities? In the next section, a case study will cast light on the proposition that the persistence of wage differentials between day and monthly workers not otherwise explained testifies to a considerable degree of segmentation in the farm labor market.

3.4 The Comparative Demographics of Farm Laborers: The Case of the Ward Farm

Each of the laborers on the Ward farm in Shrewsbury, Massachusetts, a farm that used a great deal of both day and contract labor from 1787 to 1890, has been identified at Old Sturbridge Village by linkage to genealogical records. Comparison of the two groups with respect to age, marital status, and place of birth strongly supports the conclusion that these two segments of the farm labor force were being drawn from two quite different populations, in

36. In the few cases where wage and starting month were given but duration was not, the wage was applied to the starting month only.

37. The per diems were entered each month for the duration of the contract even in the case of quits, since it is the intentions of the parties to the wage-setting process that interests us here.

Table 3.5 **The Seasonality of Farm Wages, Massachusetts, 1760s through 1850s: Day Wages of Contract Workers, Day Workers, and Harvest Workers (decadal averages, in dollars)**

Years	Category	January	February	March	April	May	June	July	August	September	October	November	December
1764–69	Monthly Per Diem	.199	.199	.207	.208	.209	.205	.205	.205	.205	.203	.195	.188
	Day Work	.360	.338	.330	.385	.412	.418	.415	.424	.367	.380	.434	.468
	Harvest							.455	.455				
	N = 17												
1770–79	Monthly Per Diem	.158	.161	.161	.224	.241	.238	.238	.238	.234	.217	.187	.187
	Day Work	.330	.365	.368	.398	.393	.396	.436	.388	.411	.384	n.a.	.388
	Harvest							.484	.484				
	N = 10												
1780–89	Monthly Per Diem	.187	.197	.251	.245	.246	.249	.255	.262	.238	.231	.205	.188
	Day Work	.330	.290	.383	.499	.437	.404	.423	.417	.330	.260	.520	.415
	Harvest							.493	.493				
	N = 16												
1790–99	Monthly Per Diem	.208	.208	.243	.241	.250	.246	.272	.263	.258	.241	.200	.216
	Day Work	.323	.375	.427	.439	.437	.460	.504	.538	.531	.386	.476	.382
	Harvest							.589	.589				
	N = 36												
1800–1809	Monthly Per Diem	.273	.270	.302	.351	.351	.369	.365	.357	.351	.342	.318	.295
	Day Work	.432	.531	.532	.569	.531	.571	.653	.572	.611	.490	.464	.528
	Harvest							.700	.700				
	N = 77												

1810–19	Monthly Per Diem	.332	.341	.328	.366	.391	.395	.403	.401	.397	.371	.383	.360
	Day Work	.606	.594	.658	.633	.678	.731	.796	.828	.711	.687	.645	.621
	Harvest							.919	.919				
	N = 95												
1820–29	Monthly Per Diem	.303	.319	.331	.362	.370	.361	.356	.359	.355	.344	.317	.328
	Day Work	.700	.563	.655	.684	.667	.625	.718	.698	.593	.610	.624	.666
	Harvest							.867	.867				
	N = 89												
1830–39	Monthly Per Diem	.354	.382	.379	.407	.429	.443	.445	.455	.436	.453	.383	.368
	Day Work	.681	.635	.563	.704	.716	.762	.880	.695	.701	.678	.746	.730
	Harvest							.991	.991				
	N = 63												
1840–49	Monthly Per Diem	.457	.463	.462	.483	.491	.501	.507	.498	.493	.503	.505	.453
	Day Work	.604	.612	.767	.750	.762	.802	.901	1.00	.859	.778	.760	.695
	Harvest							1.03	1.03				
	N = 102												
1850–59	Monthly Per Diem	.360	.348	.383	.490	.502	.502	.501	.502	.487	.478	.424	.375
	Day Work	.645	.700	.855	1.25	.855	.830	.950	1.06	1.08	.821	.500	.835
	Harvest							1.15	1.15				
	N = 48												

Notes: Monthly Per Diem is a decadal average of contract wages per month, divided by 26, which have been entered for every month of each contract. Day Work is a decadal average of the wages paid to day workers for all tasks other than haying, reaping, and mowing, for the month in which it appears in the table. Harvest is a decadal average of the wages for the tasks of mowing, haying, and reaping only, and performed by day workers in July and August. N is the number of fully specified contracts stipulating year, starting month, duration, and wage. The total number of such contracts was 553. n.a. = not available.

Sources: Day wages and monthly contract wages are from Rothenberg sample of farm account books. For sources of day wages, see my "The Emergence of Farm Labor Markets and the Transformation of the Rural Economy: Massachusetts, 1750–1855," *Journal of Economic History,* 48 (Sept. 1988), pp. 562–63.

Table 3.6 **Harvest, Seasonal, and Day Wage Differentials, 1760s through 1850s, by Decade (wages in dollars per day)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
					Harvest Premium		Seasonal Premium	
Years	Average Monthly Per Diem	Average Non-harvest Day Wage	Average Harvest Day Wage	Day Wage Premium/Monthly Per Diem (2)/(1)	Harvest Wage/ Non-harvest Day Wage (3)/(2)	Harvest Wage Monthly Per Diem (3)/(1)	High Month/Low Month for Non-harvest Day Wages	High Month/Low Month for Monthly Per Diems
1764–69	0.202	0.394	0.455	1.95	1.15	2.25	1.42	1.11
1770–79	0.207	0.387	0.484	1.87	1.25	2.34	1.32	1.53
1780–89	0.230	0.392	0.493	1.70	1.26	2.14	1.92	1.40
1790–99	0.237	0.440	0.589	1.86	1.34	2.49	1.67	1.36
1800–1809	0.329	0.540	0.700	1.64	1.30	2.13	1.51	1.37
1810–19	0.372	0.682	0.919	1.83	1.35	2.47	1.39	1.23
1820–29	0.342	0.650	0.867	1.90	1.33	2.54	1.28	1.22
1830–39	0.411	0.708	0.991	1.72	1.40	2.41	1.56	1.29
1840–49	0.485	0.774	1.03	1.60	1.33	2.12	1.63	1.12
1850–59	0.446	0.866	1.15	1.94	1.32	2.57	2.50	1.44
Means				1.80	1.30	2.35	1.62	1.31

Notes: Column 1 is based on per month wages for contract labor divided by 26. Monthly per diems were entered for every month for the anticipated duration of each contract, even in the case of sudden quits. Column 2 is based on day wages for all tasks except haying, mowing, and reaping. Column 3 is based on day wages for haying, mowing, and reaping.

Source: Table 3.5.

which case some of the pay differential, or at any rate its persistence, may be explained as the working of a dual labor market.[38]

Table 3.7 summarizes personal characteristics in the Ward Farm Laborers' Biographical File by decade, from 1787 to 1866.[39] Taking the period as a whole, half of the day laborers, but only one-quarter of the contract laborers, were born in Shrewsbury. The proportion of foreign- born contract workers was twice that of day workers. The average age of day workers was 41.6 years and several men were in their seventies, but the average age of contract workers was only 26.5 years.[40] Over 80 percent of the day workers were married, while over 86 percent of the contract workers were unmarried.

But the period should not be taken as a whole, for 1830 was a turning point. Before 1830, nearly 70 percent of contract workers came from within twenty miles of Shrewsbury; after 1830 it was less than 10 percent. After 1830, the foreign-born came not from England and Scotland but from Ireland and French Canada. The rate of sudden quits rose from 16 percent to 33 percent.

38. I do not intend, by the use of the term "dual labor market," to engage in a political controversy over whether the market for rural labor "worked," in the neoclassical sense. After all, unlike race, ethnicity, gender, and educational deficits, the contract workers who were too young, too single, too uprooted, and too Irish or Acadian, would in time become as old, as married, and as "American" as more respected workers. Nevertheless, in the short run they were identifiable as having more limited options.

39. Property holdings may be as important as place of birth, marital status, and age in describing these two populations. In fact, the Wards' day laborers were poor: one-third were without property in the 1790s, over half in the 1800s, over two-thirds in the 1810s, and all were propertyless in the 1820s and again in the 1850s (Larkin, "'Labor is the Great Thing in Farming,'" p. 205).

In this respect, too, the day laborers' status was as ambiguous in nineteenth-century Shrewsbury as in early modern England, where day laborers were at the very bottom of the agricultural ladder, yet were looked to for special skills. According to Kussmaul, in *Servants in Husbandry*, "The hierarchy of farmworkers ran from the farmer's sons down to servants [-in-husbandry] and finally to [day] labourers. . . . To be a servant was to be a potential farmer, but to be a labourer was to be a realized failure" (p. 80). On the other hand, she notes elsewhere that "skilled . . . work continued to be done by day-labourers" (p. 101).

40. Seven contract workers and eight day workers were boys under 16 years of age; the youngest, a day worker, was 11. The reasons in 1836 for "putting out" young George Homer, age 12, to work for the Wards for thirty-five months may have been the same as those in Plymouth two centuries earlier: to teach him to read and write and an artisan skill, "to bring him up in his imployment of husbandry," to remove him from an impoverished home, or to be his guardian if he had been orphaned. See John Demos, *A Little Commonwealth: Family Life in Plymouth Colony* (New York, 1970). The quote is from p. 71.

While I do not know how George Homer fared in the Ward household, there are some hints about the effectiveness of such apprenticeships to be gleaned from the account book of Jabez B. Low, a farmer and comb maker of Leominster, Massachusetts:

1813 November the 19: Phineas Prowty come to live with me and will be 15 years in february Next the 15 day. 1815, Febr 4: the above Phineas went from School. and I know not whare.
1815 June 21: Elize Chandler Come to live with me and was 8 years old th 12 of April Last. 1818 Decr 16: Elize Chandler Left my house & hath not Returned.
1820 June 19: Persis Warner come to live with me & was 13 years old the 24 of Febr Last. November 18: Carried Persis to hir Fathers & Left hir.
1830 Septr 7th: Andrew Low Left my house when I was gone to Albany and without a justifiable cause.

Table 3.7 **Comparative Demographics of Contract and Day Workers on the Ward Farm, 1787–1866**

Decade	Number of Observations	Age	Married	Single	Place of Birth				
					Shrewsbury	Within 15 miles of Shrewsbury	Massachusetts	Native born, Out of Massachusetts	Foreign born
					Contract Workers				
1787–96	18	23.0	0	13	9	3	3	0	0
1797–1806	14	27.5	2	6	1	7	3	0	1
1807–16	36	25.9	4	16	14	9	4	0	0
1817–26	66	21.4	2	38	23	18	8	2	4
1827–36	49	23.4	4	25	3	5	16	3	14
1837–46	20	28.7	2	5	0	1	12	0	4
1847–56	26	31.1	3	15	0	2	6	6	5
1857–66	29	30.6	5	13	1	3	2	5	13
					Day Workers				
1787–96	59	37.5	47	6	34	2	7	1	6
1797–1806	71	38.5	66	3	27	12	10	1	18
1807–16	67	36.6	42	22	37	14	13	0	1
1817–26	138	42.4	54	43	76	17	29	2	3
1827–36	144	40.0	109	30	69	16	35	4	5
1837–46	74	42.4	62	6	19	9	30	3	6
1847–56	56	45.2	44	6	17	5	17	7	7
1857–66	59	50.5	40	6	12	2	3	20	11

Notes: Summing across marital status or across place of birth often does not equal the number of observations because of missing information.
Source: Ward Farm Laborers' File (Old Sturbridge Village, courtesy of Jack Larkin).

After 1830, the rural labor force was becoming not only segmented but perversely segmented, by which I mean that irregular day work was being done by stable, older, married men, born and rooted in the community, while steady, live-in work was being done, increasingly over time, by "travel-weathered men from much further away, most of them culturally alien, more migratory but less hopeful," transients, migrants, passersby who "come here to work," hired in the case of the Wards, quite literally, off the road.[41]

Arrangements with such men frequently began cautiously, conditionally, "as long as I want him," "no stated time agreed upon to stay," with the first month a probationary period at a lower wage, to be regularized "if he live with me a year," "if I want so long," "if we like," "if he is faithful and learns to work well."[42] Many of them did not. In my sample there are sixty-eight instances of sudden quits, just about 10 percent of total contracts. In August 1820, Samuel Plumer of Epping, New Hampshire hired one worker on contract who quit after eight days, another in September who quit after two weeks, another in November who quit after four days, and another the following January to work through the winter who left before the month was out.

From a broad perspective one might well ask, "How much of observed, voluntary turnover [that is, quitting] reflects opportunism and how much of it is the rational outcome of moving workers from lower to higher valued uses?"[43] Merely to raise the question, even if it cannot be answered, suggests that with "higher valued" opportunities opening up outside of farming, there was a pronounced change in the quality of those who remained.[44] The deterioration would be particularly pronounced in the pool of full-time farm workers.

If day workers and monthly farm laborers were indeed drawn from two

41. Larkin, "'Labor is the Great Thing in Farming,'" p. 218.

Dual-labor-market theory distinguishes between primary and secondary labor markets, the primary composed of better jobs, the secondary composed of low-paying jobs "held by workers who have unstable working patterns" (Glen G. Cain, "The Challenge of Segmented Labor Market Theories to Orthodox Theory: A Survey," *Journal of Economic Literature*, 14 (Dec. 1976), p. 1222). "There are distinctions between workers in the two sectors which *parallel* those between jobs" (Peter B. Doeringer and Michael J. Piore, *Internal Labor Markets and Manpower Analysis* [Lexington, Mass., 1971], p. 65, emphasis mine). In calling the market for rural labor after 1830 "perversely segmented," I wish to make the point that the distinctions between workers' characteristics in the two sectors (that is, between daily and monthly laborers) after 1830 did *not* parallel those between jobs.

42. Back-end loading—"the worker gets less than his marginal product at date 0 and at least his marginal product at date 1"—was clearly a defense against worker quits. "One may ask why the contract cannot specify either that a worker cannot quit at all, or (less extremely) that a quitting worker must compensate the firm by paying an 'exit fee'" (Hart and Holmstrom, "Theory of Contracts," p. 111). Instead, and in fact, as has been said repeatedly in this paper, quitting workers were paid in *quantum meruit*.

43. Rosen, "Implicit Contracts," p. 1170.

44. It will be recalled that whaling, too, suffered after 1820 from the deterioration in the quality of crews when alternative occupations ashore became more attractive. It is estimated that productivity in whaling fell 0.3 points between 1820 and 1860 as a consequence of a 52-point increase in wages ashore. See Lance E. Davis, Robert E. Gallman, and Teresa D. Hutchins, "Productivity in American Whaling: The New Bedford Fleet in the Nineteenth Century," in David W. Galenson, ed., *Markets in History: Economic Studies of the Past* (New York, 1989), p. 136.

increasingly different populations, it might be possible, even in the socially fluid society of antebellum America, to confirm that fact in their subsequent careers. What follows is an admittedly preliminary attempt to discover what became of them by linking some of the contract workers in my sample and in the Ward file to the 1850 federal manuscript census.[45]

Table 3.8 traces some of the monthly laborers of several major employers of contract labor: the Wards of Shrewsbury, a group of several farmers in Deerfield, Charles Phelps of Hadley, David Goodale of Marlborough, and an anonymous "market gardener" in West Cambridge (now Arlington). By 1850, 92 percent of the contract workers who had worked on the Ward farm in the four or five preceding decades had left Shrewsbury; 88 percent of Phelps's monthly workers had left Hadley; 96 percent of the men who worked on contract for the Deerfield farmers had left Deerfield; 68 percent of David Goodale's monthly workers had left Marlborough. Perhaps because of its access to major urban areas, only 43 percent of the men who worked on contract for the market gardener in West Cambridge had left town by 1850, and some of these were found nearby in Cambridge, Brookline, and Boston. Nearly half the men who had worked on contract in Deerfield and Shrewsbury had not only left town and county but could not be found in Massachusetts by 1850. Segmentation in the farm labor force, then, may have played a role in explaining the persistence of pay differentials between day and monthly workers.

3.5 Conclusion: Evidence of Structural Change in the Farm Labor Force

Is there evidence of a shift to contract labor, what I term here "structural change," in the proportions of day and monthly labor used on Massachusetts farms? To argue from a small group of account books to the farm population as a whole raises sampling issues, but the experiences of individual farmers may be instructive. Charles Phelps, Jr., of Hadley, David Goodale of Marlborough, and the Ward family of Shrewsbury all used large numbers of hired labor. In the case of Phelps and Goodale, it is possible to count man-days of monthly labor (number of contract months multiplied by twenty-six working days per month) and man-days of day labor recorded in their books. In the case of the Ward farm the number of day and contract laborers is in the data

45. The effort to link names in Massachusetts records is always subject to error because the long tradition of necronyms, patronyms, and Bible-naming patterns seriously limited the pool of first names; and two hundred years of very little immigration or in-migration seriously limited the pool of last names. There are not only a large number of John Hunts and William Johnsons, but several Ithamar Wards. See Daniel Scott Smith, "Child-Naming Patterns and Family Structure Change: Hingham, Massachusetts, 1640–1880," *Newberry Papers in Family and Community History*, paper 76–5 (Jan., 1977). Also, tracing individuals to the 1850 manuscript census requires truncating the sample on both ends. Farm workers who appeared in the sample much before 1800 are unlikely to be alive in 1850, and those who first appear in the sample near or after 1850 are beside the point.

Table 3.8 **Tracing Monthly Contract Workers to 1850 (by source, town, and county)**

	Ward File Shrewsbury Worcester County	Deerfield Farmers Deerfield Hampshire/Franklin County	Charles Phelps Hadley Hampshire County	David Goodale Marlborough Middlesex County	Anonymous Market Gardener West Cambridge Middlesex County
Number of names searched	50	80	34	31	21
Period of their contracts	1825–50	1800–1849	1805–30	1820–47	1836–43
Number (%) who left Massachusetts	22 (44%)	39 (49%)	9 (26%)	5 (16%)	2 (9.5%)
Number in Massachusetts but left county	9	16	14	13	3
Number in county but left town	15	22	7	3	4
% Who left town	92%	96%	88%	68%	43%
Number remaining in town	4	3	4	10	12
Number in town with no real estate	3	2	0	3	3

Sources: Ward Family Farm Laborers' File (Old Sturbridge Village, courtesy of Jack Larkin), Rothenberg sample of farm account books, and the 1850 manuscript census.

base, as is the number of man-months of contract labor, but unfortunately the number of days worked by day labor is not. However, with the Ward data it is possible to infer the magnitudes of day and monthly labor from the share of each in their total wage bill (Table 3.9).

For all three farmers, although the number of day laborers hired exceeded the number of contract laborers, man-days hired on contract swamped man-days of day labor. In most of the years between 1787 and 1890, the Ward farm expended more than 75 percent of its total wage bill on monthly labor. In most of the 21 years for which I have Phelps's records, he employed at least four times—and in 1815 eighteen times—as many man-days of contract labor as of day labor. Goodale relied even more heavily on contracts, using over ten times as many man-days of monthly as of daily labor in ten of the 28 years covered by his accounts, climaxing in 1835 when he hired 143 man-days of monthly labor, and only one day of day labor.Persuasive as these numbers may be, day labor, though relatively expensive, never disappeared. Every farm account book bears witness to the use of labor hired by the day either to "work" or to do specified farm tasks. And every farmer relied on gangs of day laborers to bring in his hay. William Odiorne of Billerica, for example, had two workers on annual contract, but in 1848 hired 90 man-days of day labor for the haying. Although the mix on individual farms was erratic, day labor remained important even as late as 1890.

The introduction of contract labor roughly coincided with the upturn in agricultural labor productivity that I have dated, in previous work, to the late 1780s. That there may have been a relation between productivity growth and the introduction of contract labor cannot be established with certainty, but contract labor may at least be understood as a way of restructuring the farm enterprise in time, analogous to restructuring the farm in space that became central to the agricultural reform movement of the antebellum years.[46] Contract workers do to time what connected farm buildings do to space: they bridge the diverse activities of mixed farming, dairying, home manufactures, and artisanal by-employments; and shelter the coming and going between them from inclemencies of market as from inclemencies of weather. "Connected farm buildings were the manifestation of a powerful will to succeed by farming," and the commitment a farmer makes when he hires a young man to live and work with him for five or six months is also a "manifestation of a powerful will to succeed by farming."[47] The live-in worker is likewise a

46. For new research on the relation between the reform impulse and changes in farm space, see Alan Synenki, ed., *Archeological Investigations of Minute Man National Historical Park.* Vol. 1: *Farmers and Artisans of the Historical Period,* Cultural Resources Management Study No. 22, National Park Service, United States Department of the Interior (Boston, 1990); and Jack Larkin, "From 'Country Mediocrity' to 'Rural Improvement': Transforming the Slovenly Countryside in Central Massachusetts, 1771–1840" (Old Sturbridge Village, 1991).

47. Thomas C. Hubka, *Big House, Little House, Back House, Barn: The Connected Farm Buildings of New England* (Hanover, N.H., 1984), p. 180.

Table 3.9 **Monthly Labor as a Share of Total Labor on Three Massachusetts Farms**

Years	Ward Farm, Shrewsbury Share of Total Wage Bill Expended Annually for Contract Labor	Years	Phelps Farm, Hadley Man-days of Contract Labor Hired Annually, as Share of Total Man-days Hired	Years	Goodale Farm, Marlborough Man-days of Contract Labor Hired Annually, as Share of Total Man-days Hired
1790–94	0.82	1805	416/463 = 0.90	1819	0/2 = 0.00
1795–99	0.74	1806	728/781 = 0.93	1821	0/1 = 0.00
1800–1804	0.47	1807	364/431 = 0.84	1822	0/9 = 0.00
1805–09	0.92	1808	572/609 = 0.94	1823	0/24 = 0.00
1810–14	0.88	1809	728/789 = 0.92	1824	52/107 = 0.49
1815–19	0.76	1810	676/780 = 0.87	1825	104/127 = 0.82
1820–24	0.71	1811	832/916 = 0.91	1826	227/246 = 0.92
1825–29	0.68	1812	936/1,023 = 0.91	1827	234/244 = 0.96
1830–34	0.78	1813	572/678 = 0.84	1828	117/136 = 0.86
1835–39	0.88	1814	286/457 = 0.63	1829	156/165 = 0.95
1840–44	0.45	1815	468/494 = 0.95	1830	299/312 = 0.96
1845–49	0.79	1829	0/96 = 0.00	1831	390/405 = 0.96
1850–54	0.81	1830	307/372 = 0.83	1832	370/386 = 0.96
1855–60	0.54	1831	226/285 = 0.79	1833	208/219 = 0.95
		1836	0/90 = 0.00	1834	357/368 = 0.97
		1837	130/498 = 0.26	1835	143/144 = 0.99
		1838	224/284 = 0.79	1836	188/191 = 0.98
		1851	130/344 = 0.38	1837	0/10 = 0.00
		1852	260/448 = 0.58	1838	139/160 = 0.87
		1853	442/668 = 0.66	1839	130/244 = 0.53
		1854	234/352 = 0.66	1840	182/341 = 0.53
				1841	182/298 = 0.61

Notes: The share of the wage bill was used for the Ward farm because man-days of day labor are not available. The wage bill for monthly contract labor was adjusted (by Jack Larkin, see below) by multiplying by 1.5 to include the imputed cost of room and board.

Sources: Ward Farm Laborers' File (Old Sturbridge Village, courtesy of Jack Larkin), and the account books of Phelps and Goodale.

bridge, available "at the will of the lord," "to take and do one sort of Business as well as another, whether Husbandry or Carpenters, or whatever I have to be done, that he is able to do; and to be as handy and helpfull as he can in the Family also."[48]

48. Walett, *Diary of Ebenezer Parkman,* 26 March 1736.