

WAGE DETERMINATION THEORY AND THE FIVE-DOLLAR DAY AT FORD:
A DETAILED EXAMINATION

by

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ABSTRACT

This thesis examines the Ford Motor Company's famous doubling of its minimum production wages to five dollars a day in 1914 in the light of current theories of wage determination. The central question, suggested by the efficiency wage literature, is whether the company's action could possibly have been a profit-maximizing thing for it to do. The answer to this question is "Yes". That raises the further question of how this could be. I frame this second question in terms of the recent theories and address it on the basis of archival and other contemporary sources.

My conclusions are as follows. The high wage did not represent a compensating differential for those actually employed in the plant: at that wage there was an excess supply of labor. Profits did indeed go up. But consideration of the plant's technology and recent changes in its production process suggests that none of the three most well-known efficiency wage theories--neoclassical models of the effects of turnover costs, adverse selection, and moral hazard-- gives a plausible account of the source of the productivity growth. None, therefore, could be a plausible central motive for raising wages so much.

Related and other evidence, some bearing on the technology and the rest on the attitudes and beliefs of the actors, suggests that Ford was buying the peace. This may be understood as a variant of strike-threat theory or (equally) the insider-outsider approach to wage-determination. I study the compensation and motivation programs of the firm subsequent to the five-dollar day announcement to develop appropriate choice-theoretic foundations for this approach. This leads to a critical discussion of the place of these programs in the history of American welfare capitalism.

An appendix justifies the underlying methodology from first principles.

Thesis Supervisor: Dr. Robert M. Solow
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I am grateful to Lawrence Summers for the initial stimulus and for many subsequent conversations. My gratitude to Robert Solow also covers such discussions. But its proper scope is far broader. His interest and his patience meant a great deal in the difficult times before I found my way.

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I owe a different sort of thanks, though one no less profound, to David Crippen (Curator of Automobile History at the Edison Institute Ford Archives), Darlene Flaherty (Archivist, Ford Industrial Archives), Robert Ruskin (Vice-President, Employers Association of Detroit), and to the staff and donors of the Automobile History Collection and the vast Burton Historical Collection of the Detroit Public library. The Dunn Papers of the Reuther Library of Labor and Urban History at Wayne State University were another useful resource. I am certain the whole project would never have gotten started without easy access to

the riches of Widener, Langdell, McKay, and Baker Libraries at Harvard and those of the Boston Public Library. There is good reason for the fame of these collections.

Professors Solow, Temin, Fisher, and Piore all served at one time or another on my Committee. I would like to thank them--and Richard Eckaus, who made the bits at the end go so smoothly and swiftly--for the efficiency and enthusiasm with which they carried out those duties.

I wrote this manuscript fairly swiftly in the end, but the gestation (or, more precisely, my gestation as a writer of such texts) took some time. During that period I received financial support from a number of sources. Most important, there was very substantial assistance from the trust set up by my maternal grandfather, the late Mayer Gore, to see to his grandchildren's education. I trust the title page makes plain my gratitude to him. The MIT Department of Economics provided a scholarship for 1979-1980, and this too was very helpful. Paul Samuelson and Franklin Fisher came up with research assistantships at times when these were needed. Carl Kaysen did as well; and if his money came with strings attached, I have to admit now that the strings pulled me in an interesting direction--albeit one foreseen by neither of us at the time, his paternalist intentions notwithstanding. Lance Taylor and Roberto Mangabeira Unger found me stimulating work to do when I needed a sense of external engagement as well as some cash. I hope all of these good people will find something of interest in what follows.

That I might actually carry off research of this sort came to me during my tenure of a Lectureship in Economics at Magdalen College, Oxford. (See Raff (1984) for the traces. I hope my old teacher Jerome Blum will be pleased at both aspects of this revelation.) I thank the President and Fellows for the easy burdens of my job, my friends Michael Bacharach, Mark Freedland, Michael Gilson, and John Rowett for their stimulating companionship, and the Economics Sub-Faculty and Modern History Faculty for the courtesy of their Lecture Lists and the argumentativeness of those who kept a game eye on the listings. This instantiation of that sort of project was begun when I was working for Franco Modigliani at the Sloan School. I did the bulk of the work during later jobs in the gift of Janice McCormick and Quinn Mills at the Harvard Business School. The support and confidence Modigliani, McCormick and Mills extended were equally appreciated.

It has been a long time coming, this thing. The same might be said of my sense of vocation in creating it. There have indeed been longeurs, and moments of *forsan et haec . . .* But in the end, I think, all has proved grist. It might have gone more briskly. But I suspect the result would have been meaner. The years have been rich ones. Let that note be the last.

Cambridge-Truro-Soldiers Field

Ann. Mir. May 1985-May 1986

La crisi consiste appunto nel fatto che il vecchio muore e il nuovo non può nascere: in questo interregno si verificano i fenomeni moribondi più svariati.

Gramsci, Quaderni del Carcere

[This work] should be read as a putting into words of what one man saw when he opened a window on our past. As Thomas Hardy puts it, a man 'should watch that pattern among general things which his idiosyncrasy moves him to observe.' A man gives what he has.

Clark, A History of Australia

e quindi uscimmo a riveder le stelle.

Dante, Inferno

Wage Determination Theory and the Five Dollar Day at Ford:

A Detailed Examination

Daniel M.G. Raff

Harvard Business School

May, 1987

(c Daniel M.G. Raff

To Miriam and Mort, ever stalwart; to Mike, ever an example of how a sense of humor about things can be maintained; and to Susan, who (after all that waiting) saw no good reason why everything shouldn't happen all at once.

Pay Day at the Ford Company.



Mir kommt diese Gefahr als die größere vor: Manche, auf die ich es mit diesen Satiren abgesehen habe, könnten im Zweifel sein, ob sie sich getroffen zu fühlen haben.

So sei denn, wo Verse und Musik dunkel genug erscheinen, daß einer, der das Licht zu scheuen hat, glaubt sich verbergen zu können, so sei also dort durch weniger verhüllte Worte Unklarheit beseitigt.

1. wollte ich alle treffen, die ihn persönliches Heil auf einem mittelweg suchen. Denn der Mittelweg ist der einzige, der nicht nach Rom führt.

Schönberg, Drei Satiren für Gemischten Chor

We are talking now of summer evenings in Knoxville, Tennessee in the time that I lived there so successfully disguised to myself as a child.

Agee, A Death in the Family

Poets and Poetesses have written the praises of Henry Ford. A telegram was even received ... bracketing his name with the other two great Americans, Washington and Abe Lincoln [But given] the developments since the eight-hour day and profit-sharing went into effect, [and considering] the conditions in the factory [now] as compared with conditions previously, ... the only American to whom he can be compared is P.T. Barnum.

♦
Industrial Union News (I.W.W.), February 1914

We want to make men in this factory as well as automobiles.

Ford, quoted in Marquis, Henry Ford: An Interpretation

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Wage Determination Theory and the Five-Dollar Day at Ford:
A Detailed Examination

1. Introduction

Few people now alive can remember a time when automobiles were not a part of almost everyone's life. Few can remember a time when the Ford Motor Company was not among the nation's largest and most prominent manufacturing companies. Few are ignorant of who Henry Ford was or would fail to associate his name with the development of the idea and techniques of the mass production which dominates manufacturing and so much more in our day. In 1986 when one speaks of Ford the man, listeners think of mass production. In the popular mind, the man and the idea are one. Ford the man seems less an auto maker than one of the founders of the twentieth century.

It was not always thus. At Christmas time in 1913, Ford was known in the auto trade and in Detroit as an all-round mechanic turned successful entrepreneur and a prosperous success in that

role. But there were many such men, and beyond their circle one must look very hard indeed for Ford's traces. Certainly the *New York Times* for that year is quite innocent of references to his name or works. Who's Who knew him not.

By the evening of January 6th this had changed beyond all recognition. His name was known to every newspaper reader in the United States and doubtless to many other Americans as well. And Americans were not the only ones to whom the word 'Ford' was now at once a name and an idea. Yet odd as it may seem, this mass of people made no association between the name and the idea of mass production. The idea in question was--or at least seemed to them to be--a different one entirely.

What they had read in that day's papers was that Ford had said he could and would pay his many employees not less than the extraordinary sum of five dollars a day. He would, in this, more than double the wages of his unskilled laborers, not excluding even the men who swept out the factory aisles. Moreover, he proposed to pay this for a work day of only eight hours instead of the usual nine. In the competitive labor market of Detroit in those days, unskilled production workers would have been bringing home a wage of \$2.34 the day before. The effect of this announcement on working people, and on their sense of possibility in their hard-scrabbling lives, can easily be imagined.

The view which proprietors across the country, and the editorialists who claimed to speak for them, was another matter. Some did take a lofty view. Mr. Ford was a wealthy man and his business was a profitable one. He had estimated the scheme would cost him half the coming year's profits; but profits were money which had to go to someone and if the company's owners wanted to cut such melons with its workers, well and good. The decision was theirs alone to take. Yet other writers were more alarmed.

Those alarmed had two sorts of concerns. Some thought, in a rather vague way, that the Ford Motor Company had always been and would always be profitable. The cash would always be there for Ford employees. These writers worried about the rest of the nation. Few other companies ever, even in their best years, turned such profits as Ford. What if everyone else's workers developed expectations? How could these possibly be satisfied? There would be such trouble. Ford's was certainly a generous gesture. But it was sowing dragon's teeth. The second group of worriers found the dragon's teeth even closer to home. It was an economic mistake, the *Wall Street Journal* said. He was a wealthy man, and they would not presume to understand his motives. But they did not believe the company could afford it.

An economist naturally wonders what was going on here. What drove wage determination in Detroit and in the Ford factory in those days? Was the rough-hewn and cantankerous owner just giving away his money? Or might he reasonably have been

expecting something economic in return? Was all this an act somehow beyond supply and demand analysis? Or can economists' assumptions and tools of analysis yield up plausible inferences as to his motives?

Three books in the historical literature would seem above all others likely to be helpful. Keith Sward's 1948 volume, *The Legend of Henry Ford*, considers the events in question at considerable length. Sward was a psychologist by training and employment, and he was extremely well read in the periodicals and ephemera of the relevant times. But he wrote without access to any company archives and he shows little interest in the statistical aspects of production. His interpretive interest is in Ford the man, and his criticisms are moral rather than intellectual. Some years later, Allan Nevins, a prominent professor of American history, wrote a magisterial three-volume history of the company and its times. It was published at intervals between 1956 and 1963, and was the first work to rely upon the vast archives the company had assembled and catalogued in Dearborn in the early 1950's. Nevins and his assistants ranged deeply through these and reached out from them as well. Yet the books remain a history of the company and its times. They represent very substantial scholarship and for several different reasons they discuss these events. But they too examine the events as a biographer might, looking for continuities, rather than as an economist might, looking for the abstract principles behind the instances and asking what would

have happened under different contingencies.

The best hope appears to be the recent study by Stephen Meyer, *The Five-Dollar Day: Labor Management and Social Control in the Ford Motor Company 1908-1921*. It looks at this very episode and follows in rich detail how wage, personnel, and shop-floor policies evolved over the following seven years. This is extremely thoroughly researched and it is a stimulating source. But it too leaves the economist unsatisfied. Its focus is on institutions and their history. It offers much striking material and many suggestive leads. But it does not ask the questions an economist would raise, let alone answer them.

Those questions are particularly topical now. The profession has been giving a great deal of attention recently to theories of wage determination in which profit-maximizing firms might want to offer more than the market-clearing wage rate. There are a number of well-articulated theories--alternative and possibly even mutually compatible explanations of why this might be so--and work is proceeding on various contemporary data sets to establish how broadly relevant the theories might be. The five-dollar day seems on its face as plausible a test subject as any current cross-section of industries. Indeed, if doubling wages would not increase productivity, it is hard to believe that the much more modest variations generally found in the current data sets are likely to. So the episode certainly seems a candidate for explanation by these so-called efficiency wage

theories. There was a paper circulating last springtime, "Did Henry Ford Pay Efficiency Wages" by Lawrence Summers, which did precisely this.

That paper was certainly thought-provoking. Many of the thoughts it provoked were questions which archives in Detroit seemed likely to address better than the sources Summers drew on. I went to Detroit to see what I could find out. This paper presents the results. It gives a more thorough historical analysis which enables one to distinguish much more finely these alternative efficiency wage explanations and, equally, to explore certain others.¹ Considering these theories and my evidence, I come to rather different conclusions from those Summers tentatively put forward.² The episode is interesting and, once properly interpreted, very suggestive. But it takes some doing to get to a satisfactory interpretation.

¹ I should say at the start that the efficiency wage literature usually fails to distinguish between the phenomenon to be explained (excess supply of labor with flexible wages and profit-maximizing firms) and the theories to explain it (e.g. turnover costs). Since there is no reason to think any particular list of causal theories yet examined is exhaustive, I will hereafter use the phrase 'efficiency wage theory' to describe any causal theory which explains the consequences.

² For some revised opinions, see Raff and Summers (1986). That paper may be distinguished from this in two different respects. First, it focuses on events prior to the five-dollar day and on the structure of the five dollar compensation package. The focus here is largely on what happened in response. (Where the two papers overlap on empirical matters, Raff and Summers generally summarizes the contents of this one.) Second, it gives a much less penetrating analysis of the shirking theories. See Section 12 below for a summary.

There was indeed an excess supply of labor in response to the wage rise and this, some appearances notwithstanding, was an equilibrium phenomenon. Excess supply of labor is a central feature of the standard efficiency wage theories. But the standard theories, it emerges, are at a loss to explain how Ford might have gotten value in return for his higher wages, and this is crucial to the claim that Ford was not just giving away his money (the 'Ford was nuts' explanation). Jobs at Ford were sufficiently routinized that it is unlikely turnover was extremely costly in itself or that worker selection effects were important. Improved productivity seems to have been associated with distinct increases in effort, but these increases were easily monitored. This is not the way the shirking story runs. Another (related) explanation turns out to offer a much more plausible rationale: rent-sharing, going on in a context in which history and the beliefs of employed workers matter, seems far likelier to be the central consideration here. This must qualify as intriguing in the context of the recent macro-oriented work on labor market performance which has focused on the importance of hysteresis (that is, steady states depending on the history of shocks to the system and so, more abstractly, on the history of behavioral norms).¹ Indeed, qua economic history this paper

¹ See Blanchard and Summers (1986); see also Solow (1980).

might be seen as a response to the challenge such papers such papers raise for micro-level research.*

The statistical data available for this analysis of wages and the sources of productivity growth are not as superficially rich as econometricians usually encounter, say, on macroeconomic topics. (Indeed, this fact positively urges the relevance of efficiency wage theories, the most fashionable of which turn on imperfect information. If econometric data existed, perhaps there would be no problem to study.) On the other hand, illuminating data are in fact quite plentiful, the ambiguities of aggregation are very much less a problem than usual--considering a single factory over a fairly short interval, there is no blurring of distinctions between industry and firm and no loss of interesting idiosyncratic detail to summary statistics--and statistics about the production process are in any case very far from the only useful evidence which has survived. There is a great deal of cogent material to be studied and in the end it supports fairly confident conclusions.

The paper is organized as follows. Section 2 gives a quick overview of the efficiency wage literature. Section 3 reviews the famous history, so introducing the events themselves. Section 4 frames the economist's questions which this history

* Solow (1985) puts the challenge quite explicitly.

naturally raises. Section 5 gives relevant technological history which ought to come into any sound analysis. Section 6 draws out its relevance for the questions already raised, and identifies new and interesting questions it suggests. Section 7 reconstructs the history of the local labor markets of the period. Section 8 considers the implications of that, trying to assess what the actors in that market thought of the opportunities at Ford. Section 9 summarizes what this all does and does not yet explain and puts forward a complementary explanation for the parts which still seem puzzling. Section 10 explores the mechanism of that explanation a little more deeply in the context of the later history of the five-dollar day program. Section 11 places the account of the preceding section in its business-historical context. Section 12 summarized the analytical conclusions and Section 13 ties up some historical loose ends. One appendix gives the text of the original press release, a second the text of a particularly interesting contemporary newspaper article. The third lays out briefly the ideas about method in economic history which motivate my approach in this study. It also indicates the directions in which I have begun to extend this research.

2. Recent developments in wage determination theory

For as long as macroeconomics has existed as an independent subject, one of its central concerns has been to explain how involuntary unemployment could be possible. The most recent efforts at this task, unlike the early Keynesian ones, have taken the idea of utility-maximizing suppliers of labor and profit-maximizing firms seriously: the question has been how the labor market failing to clear could possibly be compatible with demanders and suppliers behaving in a conventional neoclassical fashion.⁵ The key step was to imagine something unconventional about these agents or their environments. This allows theories in which firms deciding to pay higher than competitive wages find themselves with a disproportionately more productive workforce.⁶ Such firms prefer to employ labor which doesn't price itself to clear the market. In an economy with such possibilities, there

⁵ Stiglitz (1984) and Yellen (1984) give terse and lucid summaries. Katz (1986) is more expansive.

⁶ One strand of this body of work began in a rather different context: the physical capabilities of workers were related to the wages the workers were paid and there was no effort-elicitation problem. See Leibenstein (1957), Mirrlees (1975), Stiglitz (1976), and especially Bliss and Stern (1978). Note that this theory and its descendents assume the firms have all of the bargaining power. For related theories in which (some) workers have some of it, see Lindbeck and Snower (1986). I shall return to this distinction in Section 9. Note also that there is quite a distinct second strand to the development of this whole literature which originates in Marx. See Marglin (1974), Gintis (1976), and Bowles (1985).

will be workers who would like employment at the going wage but cannot find a job.⁷ They are involuntarily unemployed.

To begin with I consider three well-known models which produce these results. The first involves strictly neoclassical agents in an environment with an important non-convexity in the production technology. Two other models involve strictly neoclassical agents, but in environments with (different) sorts of imperfect information. It will be useful for what follows to distinguish these variant approaches from the outset.

The first model considers substantial costs to employers of employee turnover--some sort of costs to training.⁸ This is in effect an investment without corresponding rights in property. In such a situation, the employees have somehow to be induced to stay put. If requiring a bond or offering wages whose level is linked to length of service is not possible, some sort of supra-competitive wages may be the best solution.

The second model involves adverse selection. The productivity of a given worker for any given job is fixed, but the productivity varies across the working population. Each worker knows how productive he is, but the employer cannot assess

⁷ Stiglitz says "The Law of Supply and Demand has been repealed." See his (1984), p. 42.

⁸ See Stiglitz (1985).

the productivity ex ante, only ex post.⁹ The employer wants to hire only relatively productive workers. If he offers only the competitive wage when better is available elsewhere, he is certain not to get any. If he offers a superior wage, he at least has a chance at sorting wheat from chaff. He will certainly draw both: many will seek him out, but the superior workers will undoubtedly be among them. They wouldn't work for less. So, whatever else, average productivity will be higher.

The third model involves imperfect observability of on-the-job performance and so moral hazard. Workers, it is assumed, will shirk when not being watched. Perhaps it is scarcely possible to watch them in the appropriate sense. Can paying them wages above the market-clearing level induce them to refrain from shirking? One can write down a model in which the answer is yes.¹⁰ What is going on is roughly that the supra-competitive wage makes the worker, at the margin, distinctly not indifferent between the job and the alternatives.¹¹ There are rents to being employed: being fired is a real (utility-)threat to him. So he behaves himself.¹² Self-supervision substitutes for external supervision through the higher wages.

⁹ See Weiss (1980), or Nalebuff and Stiglitz (1982).

¹⁰ See Shapiro and Stiglitz (1984) or Bulow and Summers (1986).

¹¹ More formally, the constraint facing the firm that it provide workers with a reservation utility does not bind. This is particularly clear in the model of Eaton and White (1983).

¹² Part of what makes this model go is the way employers are restricted to extremely simple financial relations which the employees--no bonding, no complex compensation schemes. On this see Carmichael (1985) and Shapiro and Stiglitz (1985). Again,

It is interesting to learn that internally consistent stories along such lines can be articulated, but the practical question, of course, is the quite different one of whether any of them fit the facts. Are these a useful addition to the corpus of models of wage determination? Very recently, researchers have begun to look for evidence that efficiency wage considerations--rather than compensating differences or any of the other explanations traditional in contemporary labor economics--are important features in wage determination. I should say briefly what they have found.

Two such papers have been widely circulated during the past year, one by Dickens and Katz (1986) and the other by Krueger and Summers (1986).¹³ Each considers the inter-industry structure of wages as reported in the CPS tape in order to discriminate amongst alternative (broad) theories of wage determination. Each finds the conventional neoclassical story inadequate to their data. Efficiency wage theories--as a class--appear to do better, even if (Dickens and Katz) falling short of explaining everything

with richer choice sets, the desirability of supra-competitive wage offers may be modulated or diffused away entirely.

¹³ There is also a typescript by Jonathan Leonard (1986) in which he tests the shirking and labor turnover theories against some recent firm-level data from California high-tech firms. But this paper shares the problems of the old empirical production function literature: it has (unacknowledged) difficulties distinguishing expansion paths from shifts along a frontier in the data. Part of the appeal of the Ford case is that it is clearer what is going on there.

in this aggregate data set.¹⁴ Krueger and Summers find, in particular, that there is an inverse relationship between wage premia and turnover, effort, and the level of job discretion. It is not, on the other hand, at all clear from what they find that the premia are buying an efficient amount of these.

This is certainly intriguing. But it is hardly conclusive. It is difficult to know what to make of the findings which worry Dickens and Katz given the level of aggregation in their data.¹⁵ And the Krueger and Summers results just mentioned would be more persuasive as an explanation if the link to production

¹⁴ Their troubling finding is a strong industry effect: premia for blue collar workers would seem from their data to go together with premia for steno pool members and executives. This is certainly not a necessary implication of any of the standard efficiency wage theories. Dickens and Katz think it an inconsistency and see it as evidence in favor of one form of rent-sharing explanation--the strike-threat. (Though this is odd: the strike-threat model they have in mind, Dickens (1986), implies--pace Dickens's dictum on his p. 24--that one should expect a high correlation across occupations within an industry only if all jobs within it pose roughly equal threats to the generation of profits. That cannot be very general. But note the parenthetic remark in footnote 83 below and bear in mind in Section 9 below that the five-dollar day covered the whole of the productive workforce but none of the office employees.)

I think there are inferential problems with interpreting their evidence as strongly as they do, regardless of where the truth lies. See the next footnote.

¹⁵ There are two potential problems here. The first concerns horizontal aggregation. Different firms may sell the same sort of output but have production processes with very different skill- and discretion-requirements. The second concerns vertical aggregation within firms. It may well be true that in some lines of work almost all jobs are quite routinized while in others every detail of the organization is keyed to the idiosyncrasies of individual customers. I know of no empirical work on the prevalence of such extremes cases and or the dominance of homogenized mixtures.

technologies and organizational strategies were less blurred by heterogeneity in the data set. It seems that confidently saying whether something is going on--and if so, what in particular--will require finer, less aggregated data to start with. This sort of investigation would be useful from a normative perspective as well. The different theories yield up quite different comparative statics properties and so different policy implications. The differences in the theories are really differences in imputed circumstances of firms. One would need to look at firms to learn what to do.

Can one point to experiences of particular firms which can be explained by the well-known efficiency wage theories? Or does firm-level data suggest the choice is really between some species of rent-sharing on the one hand and firms simply not maximizing profits on the other? If that really is the choice, is there any positive evidence urging rent-sharing in aid of profits?

American industrial history does seem to offer up one obvious incident for examination at such a detailed level. This is the five-dollar day episode at Ford.

3. The conventional narrative

The conventional exposition goes something like this.

Henry Ford, working alone, made his first working prototype in 1899. He sought backers and first established his company in 1903. Early in 1908 he settled on both the design for the Model T and the idea of producing nothing else. By 1914, Ford found that he had solved one important and outstanding problem in automobile production. It seemed, however, that in doing so he had turned up another which remained troublingly unresolved.

The one he had solved was that of finding a design philosophy and factory technology appropriate to true mass production. The philosophy in force from 1908--but said to have been articulated long before--was this.

The way to make automobiles is to make one automobile like another automobile, to make them all alike, to make them come through the factory just alike--just like one pin is like another pin when it comes from the pin factory and one match is like another match when it comes from the match factory.¹⁶

¹⁶ Ford quoted in Chandler, ed. (1964), p. 28.

By 1914 his engineers had, in effect, developed the techniques required. The power of their solution circa 1914 amazed contemporaries, though the scale of it was as nothing to what was coming. In 1908, Ford had been one auto-maker among many. Between 1909, when Model T production really started, and 1914, when the new system was essentially perfected, Ford's output increased nearly twenty-five-fold.¹⁷ There was no remotely comparable change in the output of the other manufacturers. Tables 1 and 2 illustrate. He left his competitors standing in the shade.

The scale was unprecedented. Collier's wrote thus.

The Ford plant is so gigantic that there is no use in wasting words trying to describe its vastness; [it is] so full of people, all of them working for Ford, that a thousand more or less would make no difference to the look of things.¹⁸

Writing about the plant in 1913, the industrial journalist Fred Colvin tried to convey to the readers of the American Machinist the immense scope of the operation. Output numbers, he suspected, conveyed little. He thought the inputs might make more of an impression.

¹⁷ Ford moved production into the Highland Park plant in 1910. In 1915, the land for the River Rouge plant had been purchased but the factory itself had not yet been built. So the great bulk of this increase took place in the frequently reorganized but never expanded Highland Park facility.

¹⁸ Street (1914), p. 24.

Table 1: Annual production figures for Ford, Detroit,
and the industry as a whole 1908-1915

	Ford	Detroit (≈000)	Industry
1908	6 398	18 000	55 062
1909	10 607	46 000	116 680
1910	18 664	114 000	168 336
1911	34 528	130 000	175 472
1912	78 440	150 000	299 560
1913	168 220	283 000	316 780
1914	248 307	330 000	584 405
1915	308213	455 000	584 405

Source: "Annual Production of Motor Vehicles," Ford Archives Accession 96, Box 10, for the Ford and industry figures; Burton et al., Vol. I, p. 570 for the city figures. It is not difficult to find higher figures for Ford from other apparently reliable sources. I have not found parallel series for either of the other two along with them, however, and so for purposes of this comparison I have stuck to these.

Table 2: Output of some other contemporary producers

Year	Olds	Cadillac	Buick	Chevrolet
1903	4 000	2 497	6	
1904	5 508	2 457	37	
1905	6 300	3 942	750	
1906	1 600	3 559	1 400	
1907	1 200	2 884	4 641	
1908	1 055	2 377	8 820	
1909	6 575	7 868	14 606	
1910	1 850	10 039	30 525	
1911	1 230	10 071	13 389	
1912	1 075	12 708	19 812	2 999
1913	1 175	17 284	26 666	5 987
1914	1 400	7 818	32 889	5 005
1915	7 696	20 404	43 946	13 292
1916	10 507	16 323	124 834	62 898
1917	22 613	19 759	115 176	110 839

Despite the uncertainty mentioned in the note to the previous Table, the comparison is quite clear: Ford was producing on an enormously larger scale than these, almost all of his competitors noted for efficient manufacturing. (Olds and Cadillac were earlier experimenters with interchangeable parts, Buick with optimized shop floor organization.)

On Chevrolet's Great Leap Forward, see the story about Durant in footnote 145 below.

Source: Heasley, pp. 87, 126, 105, and 117.

1,000,000 lamps; 800,000 wheels and tires; 90,000 tons of steel; leather from 400,000 cattle and 6,000,000 pounds of hair for the seats and backs; nearly 2,000,000 square feet of glass for the windshields¹⁹

But even this was hard to grasp directly. "[O]ne day's shipment alone," he concluded, in terms the reader can see and practically feel, "leaving the factory a half a mile a part, would reach from Detroit to New York City." Ford's daily output compared favorably with the annual production of many competitors. The flow of cars was just spectacular.

Ford's other innovation looked, alas, equally dramatic. Turnover was high in Detroit metalworking in those boom years for the trade.²⁰ ²¹ An annual rate of 200 percent was far from anomalous in the auto plants.²² But in 1913 Ford had a rate of 370 percent.²³ To keep the work force at the desired level of

¹⁹ Colvin (1913), p. 757.

²⁰ On the tight local labor market, see Nevins, op. cit., p. 517. See also Sward (1948), p. 48. Also see the sources cited in Section 7 below.

²¹ For a sense of context, the 1913/1914 general industrial sample (84 establishments in 10 industries) of Brissenden and Frankel (1920), p. 43, shows an overall average turnover rate of 93 percent per annum. The average is 156 percent in the subsample of 15 automobile and automobile parts plants.

²² Slichter (1921), p. 33. See also Meyer, op. cit., p. 83, and the sources cited there.

²³ Slichter, op. cit., p. 244. A judicious choice of period can even put the number a little above 400 percent.

something more than 13,500 that year, they had to hire 50,448.²⁴ Lee later remarked that they were hiring "from forty to sixty percent of the workforce each month" just to maintain numbers.²⁵

So the system had been demonstrated: the production process worked. Its scale economies were there for the reaping, as market demand for the Model T then seemed to be insatiable. But the laborers were, in effect, deserting. Sward writes that

... their ranks almost literally fell apart [and] the Company ... found it next to impossible to keep its workforce intact, let alone to expand it²⁶

And Ford was thinking--eventually even talking to reporters--about expanding by nearly 5000 men.

The company's first response, in October, 1913, was prompted by some thoughtful research by the manager most involved with personnel, John R. Lee. The change involved re-evaluation of job

²⁴ Here is some typical detail. In March, 1913, 1276 men were fired and the other 84 percent of those leaving either gave notice (876) or just walked (5156). Absenteeism that year averaged 10.5 percent of the workforce. On all of these, see Tables 3 and 4. The state of the relevant local labor market was commonly said to be such that those who quit as of the morning could be employed elsewhere by lunchtime. (See, e.g., Levin, p. 75). I should note that other sources on annual turnover give slightly different numbers than the ones cited in the text, though to no different effect. I use Slichter's because his study seems to me, and appears to have seemed to contemporaries, the most careful.

²⁵ Lee (1916), p. 308.

²⁶ Sward, op. cit., pp. 48-49.

Table 3: Separations from the Ford Motor Company:
Selected months 1912-1914

Month	Five-day men	Discharges	Quits
December 1912	3 594	176	386
March 1913	5 156	1 276	870
October 1913	322	137	326
March 1914	166	166	115

Source: Abell, (1914a), p. 49, and Ford, (1916), p. 7628.

Table 4: Annual data on Ford separations 1913-1914

	1913	1914	1915
Average Force employed	13 623	12 115	18 028
Total leaving	50 448	6 508	2 931
Turnover rate	370 %	54 %	16 %
Resignations	39 575	5 199	2 871
Lay-offs	2 383	385	23
Discharges	8 490	926	27

Source: Slichter (1921), p. 244.

compensation and rationalization of the pay structure and hiring procedures.²⁷ These measures (commonly known as the Lee Reforms) had the effect of taking power from the foreman and, generally, bureaucratizing employment relations.²⁸ There was also an across-the-board pay rise of about 15 percent. This last brought wages for any particular job roughly up to the going rates.²⁹ But none of this helped much--turnover plunged in October but swelled again throughout late 1913.³⁰ The company announced a 10 percent bonus to three-year men at the end of December. One sees the situation vividly in the information that only some 640 of the then 15,000 employees qualified.³¹ The next few days brought dramatic events.

²⁷ "Ford Auto Workers Get Raise in Pay" Detroit Tribune, October 12, 1913, p. 11. For the pay structure, see Table 5.

²⁸ Theretofore, when men were needed the relevant foreman simply went to the factory gate and chose someone from the morning's crowd. There was real patronage power in this since the foreman had great and unsupervised control over compensation, work pace and conditions, and so forth. The patronage power was apparently quite often abused. Men in need would paint the houses or cut the lawns of some foremen to get into or remain in his good favor. Sometimes, indeed, it seems to have been simpler just to offer kickbacks. On all of this, see Barnard (1983), p. 26.

²⁹ So says O'Connor, a foreman at the time, on p. 29 of his *Reminiscences*. The company, on the other hand, congratulated itself on paying a small premium. The plant was on the outskirts of Detroit, and perhaps what was premium to the company was carfare to its workforce. My impression is that the bureaucratization seemed to all parties the more important development.

³⁰ For October, 1913, see Table 3 above. For the characterization of the remainder of the fourth quarter, see Hounshell (1984), p. 258. Maddeningly, no proper time series of monthly data seems to have survived.

³¹ Ford Motor Company Directors' Minutes, December 31, 1913.

Table 5: Pay scales under the October 1913 Lee Reforms

Skill rating	Hourly pay	Daily
A-XX	.65	\$5.85
-X	.54	5.40
-1	.54	4.86
-2	.48	4.32
-3	.43	3.87
B-Service	.43	3.87
-1	.38	3.42
-2	.34	3.06
-3	.30	2.70
C-Service	.38	3.42
-1	.34	3.06
-2	.30	2.70
-3	.26	2.34
D-1	.34	3.06
-2	.30	2.70
-3	.26	2.34
E	.26	2.34
Special	.23	2.07

Key: A: Mechanics and sub-foremen 1: First-class worker
 B: Skilled operators 2: Men of average ability
 C: Operators 3: Beginners
 D: Helpers
 E: Laborers

In the course of solving the technological problem, Ford had become an extraordinarily wealthy and powerful man. In 1914 he owned 58.5 percent of the company. So he could do what he liked with his substantial personal capital and, more to the point, with the enormous and unprecedented income streams the company was producing.³² He decided to cope with the second problem--or whatever lay behind it--with the five-dollar day scheme, a radical change in his workers' compensation.³³

The scheme had several components. Total pay was to rise--roughly to double.³⁴ The factory hands had been being paid \$2.34 a day. That total was to be increased to \$5.00 and the hours worked for it were to be reduced from 9 to 8. The degree of formality in the employment relation--of governance by rules, with appeal to impersonal tribunals and a Transfer Department open to the discontented--was to increase even further. All but

³² The constraint on his control over the income which came in 1919, in *Dodge v. Ford* (204 Michigan 450ff.), was still some time in the future. For a clear discussion of that famous case, see Clark (1986), pp. 602-604. Also see the next footnote.

³³ As a sidelight on the lawsuit mentioned in the previous footnote, the actual setting of the five-dollar wage is an excellent example of the autonomy with which Ford might exercise control. He was resolved on raising workers' incomes. How much? demanded his manager and fellow shareholder Couzens. Ford considered some alternatives. Four dollars a day, he proposed. Couzens was outraged. The outrage was expressed as a taunting dare--if a man they then paid \$2.34 was worth \$4.00, then why not \$4.50? Why not \$5.00? Why not indeed, said Ford, and ordered a press release prepared. (See, e.g., Hounshell, op. cit., p. 258.) This wage rise committed at a stroke half the expected profits for the coming year.

³⁴ For the particulars of pay, see Table 6.

Table 6: The five-dollar day across skill grades

	(i)	(ii)	(iii)	(iv)
Mechanics and sub-foremen	4.32	4.88	6.25	28.1
Skilled operators	3.06	3.44	5.50	59.9
Operators	2.70	3.04	5.25	72.7
Helpers	2.70	3.04	5.25	72.7
Laborers	2.34	2.72	5.00	83.8

(i) Pre-five-dollar day wage share

(ii) Five-dollar day wage share

(iii) Total compensation under five-dollar day scheme

(iv) Percentage of (iii) which is profit share

Source: Emmet (1916), pp. 95 and 97.

about 10 percent of the employees--those excluded were, in effects, those 21 and younger--were expected to received these benefits, subject only to confirmation that they were leading reasonably undissolute lives.³⁵ ³⁶ The package was described as profit-sharing, to leave the company room for maneuver if they had second thoughts.³⁷ But this description seems to have meant more to business men and socialist journalists than to working men. Working men, in Detroit and elsewhere, seem to have noticed little but the proposed income. The cartoon which is the frontispiece to this manuscript displays one popular impression.

Turnover rates fell precipitously. Vast queues of job seekers formed promptly at the factory gates. Productivity--so crude annual averages suggest--leaped ahead nearly 70 percent. (See Table 7.) The story usually ends here, or abandons economic questions for the more colorful ground of working men's culture and the company's character investigations.

³⁵ For more on these "investigations", see Section 10 below.

³⁶ To begin with, the company withheld the premia until the worker was investigated and then paid out the arrears. Later in the year the company began requiring a six-month probationary period before any premia began accruing. See Section 6 below and, for the reaction of one of the workers, the long quotation from Charles Madison (1980/81) in Section 8.

³⁷ For the full text of the announcement, see Appendix I.

Table 7: Crude statistics on Ford worker productivity 1909-1914

Year	Output	Av. Workmen	Productivity	Productivity Index (1909=100)
1909	10 607	1 655	6.41	100
1910	18 664	2 773	6.73	105
1911	34 528	3 976	8.68	135
1912	78 440	6 867	11.42	178
1913	168 220	14 366	11.70	182
1914	248 307	12 880	19.28	301

In 1909 and 1910 the Flanders system (on which see Section 5 below) was becoming routine. Production moved to the Highland Park plant in 1910 and, as time passed, fuller and fuller advantage of American System production (do.) and the plant's particular opportunities was taken. The moving assembly line system--the quintessence of these two together--began being established in an integrated way in the winter of 1913-1914.

Source: Annual output figures come from Table 1. The average numbers of men on roll comes from Nevins (1954), p. 648 (quoting from papers in evidence for the Additional Tax Case on file in the Ford Archives).

4. The up-to-date economist's questions

Putting the wage rise and the idea of market equilibrium at the center of attention, three questions arise. Was there excess supply of labor at the new wage? If so, did such a supra-competitive wage raise productivity? Did it raise profits to a maximum? An affirmative answer to all three is required by (any strict version of) efficiency wage theory.

Evidence that there was excess supply of labor is anecdotal but appears overwhelmingly clear. Contemporary accounts are particularly vivid on the subject of the queues.¹⁸ These formed shortly after the announcement and were, at least to begin with, of dramatic length (on several days the numbers were widely estimated at over 10,000) and tenacity.¹⁹ The volume of

¹⁸ The Detroit papers had more pictures. But the New York Times coverage was comparably detailed. See, especially "Job Seekers Riot, Storm Ford Plant," New York Times, January 13, 1914, p. 2. As a sidelight on how well-known the events at Ford were, I note that this piece was one of no less than thirty articles, editorials, and letters the Times published about Ford and the Ford Motor Company between January 6th and 28th.

¹⁹ For more on the drama, see the photograph accompanying the Detroit News article on the front page of the January 6th issue ("Ten Thousand Men in Battle for Jobs at the Ford Motor Company"). The reference to tenacity concerns conditions on the queue. Men sometimes waited outdoors all night in the coldest part of a Michigan winter. When the Ford authorities wanted the job-seekers driven away, clubs and firehoses--indeed, firehoses in temperatures which even by day got only barely above zero--were required. See the page 1 stories in the Detroit News for January 7th ("Ford Plant to use Snell Farm to Employ Help ...

correspondence coming to the head of Ford's Employment also jumped. "From this time on," records the *Reminiscences* of the Employment Office clerk, "I received more mail than the President of the United States . . ."⁴⁰ "It rained letters; it poured letters. Letters came by dozens, by grosses, by hundreds, . . . by thousands."⁴¹ Fourteen thousand were said to have arrived by January 12.⁴² The company employed 13,751 at the time.⁴³ ⁴⁴

The evidence for the five-dollar day raising productivity is a little more elusive. The numbers in Table 7 are indeed very impressive. But precisely what they illustrate is, on the other hand, much less clear.

This evidence is crude in two distinct senses. It leaves out information one would like to know, e.g. the particulars of input quantities and costs. And it could well include information which doesn't belong i.e. through failing to filter

 Police Use Clubs to Beat Back Mob") and 12th ("Mob of 10,000 Riots at Ford Plant Doors: Job Seekers Dispersed Only by Drenching with Ice-Cold Water: Officer Knocked Down and Is Rescued with Difficulty").

⁴⁰ Bondie, *Reminiscences*, p. 11.

⁴¹ "Letters! Letters!! Letters!!! Recent Announcement of Profit-sharing Caused Big Influx of Mail," 8 *Ford Times* (1914), p. 253.

⁴² "Icy Fire Hose Deluge Stops . . . Riotous Rush for Ford Jobs," *Detroit Journal*, January 12, 1914, p. 1.

⁴³ Ledger sheets entitled "Model T Production Statistics", (monthly, 1909-1919) in Ford Archives Accession 922. (The monthly tally sheets which this summarizes appear to be those in Ford Industrial Archives Accession AR-65-106, Box 1.)

⁴⁴ Interestingly, some of the subsequent correspondence seems to have been prepared by professionals. By the following year, the company had discovered that some people were charging \$0.50 to \$1.00 a letter for writing out a fluent application. (See the

out the effects of contemporary but unrelated changes (in physical capital and in the logistical organization of inputs) which might have affected overall productivity quite independent of what was happening to the input of labor effort. Clearly something was going on here. But precisely what, and how much of it, is difficult to discern immediately.

Extremely detailed cost data survives from December, 1913, and then monthly from March, 1914. I display five observations in Table 8. They show total costs for the chassis, including the new wage and allocated overhead, actually declining over the year starting December, 1913. (The Table's text gives further analysis. See also Table 9.)

It is possible to get closer to a real time series and significance testing with somewhat coarser data. Raff and Summers, drawing on the plant records cited in footnote 43 above, regressed the log of productivity (represented alternatively using total labor hours and only production labor hours in the denominator) on seasonal dummies, a time trend, and, alternately, dummies for 1914 and 1914-1915.⁴⁵ The results' highlights are

 memorandum to J.R. Lee from H.R. Hartman dated 4/30/15 in Ford Archives Accession 940, Box 16.) This in itself suggests excess supply of labor at the quoted wage.

⁴⁵ The real value of the compensation started changing significantly in 1916, whence these dummies. On this see section 10 below.

Table 8: Cost breakdowns for the Model T chassis 1913-1915

Month	Materials	Labor	Overhead
December 1913	122.23	17.03	22.66
March 1914	105.07	23.54	31.40
June 1914	106.29	26.18	34.94
September 1914	94.69	25.86	34.54
December 1914	99.28	24.39	32.52

Overhead costs were rising due to the investments in dedicated capital which made mass production possible. (See Hounshell *passim*.) Materials costs were falling due to the application of mass production methods. (See Abell (1914b), p. 308. There was also direct backward integration.) The unit cost of labor did rise sharply, due to the wage increase. But the unit cost of output fell overall.

The overhead calculation in these accounts do not appear to distinguish current from capital spending. I would expect the figures for overheads to fall *ceteris paribus* in 1915 as the dedication grew substantially complete. My hypothesis in section 10 suggests that the labor figures ought to fall as well. These data exist and will be incorporated here and commented on in the appropriate place in the next revision of this manuscript.

Source: Ford Archives Accession 125 (Model T Cost Books)

Table 9: Investment in productive capital
in the Highland Park Assembly Line and Cylinder Block
Departments: 1919 and 1922

Department	1919	1922
Assembly line	3 490	38 832
Cylinder block	658 341	1 176 155

The assembly line itself was mechanically simple and relatively quite inexpensive.

Source: Lewchuk (1985), p. 90 (quoting the 1919 Departmental Appraisals in Accession 73 and the February 1922 Highland Park Plant Accounts in Accession 571.)

shown in Table 10.⁶⁶ They show a productivity increment of between 40 and 70 percent to be attributable to the five-dollar day. This seems substantial, particularly as these percentages take no measure of the increased share of value added being generated within the plant.

Another way of getting at the effect of the change on productivity is to consider output prices. If the wage rise represented a substantial increase in unit costs, one would expect to see it accompanied by rising output prices and falling profits. Just the opposite occurred. (See Tables 11 and 12.) Profits (measured either in real or in nominal terms) rose healthily in 1914 and again in 1915.⁶⁷ Output prices continued their steady decline.

Thusfar, then, the situation sounds very much like conventional efficiency wage theory at work. Certainly the canonical consequences are present. But were they caused in the right way?

The individual theories are in principle testable. If one knew enough about training costs, for example, one could

⁶⁶ Data were monthly running 1912-1918. Full details and printouts are available from the author.

⁶⁷ Readers will notice that these increments are smaller than the ones which preceded them. An explanation as to why this should be so will emerge from sections 5 and 9. Their relative size has, of course, nothing to say about whether the 1914 measures were profit-maximizing at the margin.

Table 10: Productivity regression highlights

Time period for dummy	Log of output per production workers	Log of output per total workers
1914	.655 (.164)	.528 (.177)
1914-1915	.530 (.155)	.414 (.166)

Estimates are based on regression equations including seasonal dummies and a time trend. The data (monthly) run 1912-1918. The figures in parentheses are standard errors.

Source for regression data: Ford Archives Accession 922.

Table 11: Output prices 1911-1916

Announcement date	Model T Touring Car price
October 1, 1910	\$ 780.00
" 1911	690.00
" 1912	600.00
August 1, 1913	550.00
" 1914	490.00
" 1915	440.00

Source: Nevins, pp. 646-647 (citing Ford Times files).

Table 12: Ford Motor Company net income 1910-1915

	Nominal \$	\$ 1910
1910	4 163 451	4 163 451
1911	7 338 588	7 413 464
1912	13 542 678	13 139 301
1913	27 087 204	26 452 347
1914	31 757 769	30 419 318
1915	40 307 167	36 901 187

Source: Nevins (1954), p. 647, quoting Ford Archives' Martindale Papers. (The 1914 and 1915 figures have been adjusted to put them, like the others, on a calendar year basis.) The real values have been calculated using the GNP deflator from U.S. Department of Commerce (1975), p. 224.

calculate the value of a given fall in turnover rates. The value of the historic fall could be compared with the change in compensation. Similarly, to choose another example, one could in principle test the shirking model. What happened to the quality of production-line output with the wage-change (holding line speed constant)?⁴⁸ Productivity data in terms of men and cars per year over any extended period would be far too coarse to reveal much. But there might be more to tell here. For example, the shirking story suggests cuts in supervisory intensity accompanying--though, as a practical matter, perhaps only after a prudent interval--the wage rises. In cross-section, high wages ought to go along with production processes in which monitoring is relatively more difficult. If the data goes against these, the best that can be said is that advocates of the shirking model have some explaining still to do. And so on.

Not all the data such schemes require has survived, but a good deal has. I explore that data and draw out implications below. In exploring it, the reader might keep in mind that the point of the efficiency wage theories is not that within some wage range wage rises elicit disproportionate productivity rises but rather that this happens when the wage rises and all else is constant. If wages rise at the same time that work content is changed, it is a different job which is being offered, and

⁴⁸ See Matthewson (1929), pp. 125-126.

perhaps one which is harder to assess ex ante. This observation suggests that the dramatic turnover and putative 'soldiering' may not have been the whole story--indeed may have been more symptom than problem. It urges curiosity about what other important changes may have been going on in and around the Highland Park plant during and before the time of the five-dollar day. I turn next to one obvious candidate.

5. Inside the factory

Something else was indeed going on in this period in Highland Park. Ford's engineers had long been hard at work moving the firm towards continuous process production, an effort which culminated in the thoroughgoing use of American System production of parts and moving assembly line production.⁴⁹ The first steps of this can be discerned as early as late 1908. The transition began in earnest in the spring of 1913, and in the succeeding eighteen months the techniques seem to have been more or less fully developed and deployed.

There were a number of stages in this evolution of production technology, each carrying with it a change in the experience of work and so a change in both the understanding of

⁴⁹ On the American System, see Hounshell, *op. cit.*, *passim*. Loosely, it means using dedicated machine tools and mechanical aids (jigs, fixtures) for holding the work materials in them to produce very nearly identical, and so interchangeable, parts. 'Dedicated' means 'designed to perform a single task, possibly on parts of only a single set of specifications'. The contrast here is to 'general purpose' machines which could be used for any of a wide variety of tasks so long as the operator was sufficiently skillful. It was the American System, rather than moving assembly lines per se, which made mass production possible. See, e.g., Wollering, *Reminiscences*, p. 15. The Ford development of the American System attracted professional attention long before the moving assembly lines. Abell (1912) is the second article in a series about Highland Park production.

work--the meaning to the worker--and the amount of effort required.

Production in the earliest years of the industry had two salient characteristics, both rather in the image of the building of prototypes. The skilled workers had to be excellent all-around machinists. Almost all of the component parts were made by suppliers, but the tolerances were generally very far from exact and a great deal of reaming, filing, hammering, and general fitting was required to get the car together and working properly. Second, the shops were generally organized grouping all machines of any particular type together in a single place.⁵⁰ Men had to move around to get to the tools, and the parts they were working on had to be moved as well. It was possible to produce on a considerable scale under these circumstances--in 1905, the Olds factory produced over 6000 vehicles, occasionally getting out as many as 40 cars in one day, though it seems to have been the marvel of the industry for this feat--but further expansion seem to require new methods rather than just more space.⁵¹ Thus Sward writes that

... when the company brought out the Model T in 1908, its assembly methods were much the same as they had been [when working in a] carpenter's shed five years earlier [T]he process of putting an

⁵⁰ These tools would still have been general purpose machines.

⁵¹ On Olds output, see Epstein (1928), p. 37.

automobile together ... revolved around the versatile mechanic, who moved around in order to do his work [A]ssemblers were ... all-around men.⁵²

It was just as in Ford's inventing days. Why should it have been any different? The tools were ordinary mechanic's tools, the workspace just a larger version of his shop.

In September of 1908, with demand heavy and the shopfloor visibly chaotic, Ford hired a well-known efficiency expert named Walter Flanders with the assignment of getting 10,000 cars out of the factory in the succeeding twelve months.⁵³ He did it, mainly through the innovation of organizing tool placement to go along with the production process of Ford's car.⁵⁴ On the other hand, the work was still highly skilled and the division of labor coarse. This was so partly because the imprecision with which the parts were still made would not support anything more routinized.⁵⁵ The demands on the skill and judgment of the

⁵² Sward, op. cit., p. 32.

⁵³ There is some dispute about Flanders's dates with the company and about the details of the story in this sentence. Compare, e.g., Nevins, op. cit., p. 334ff (or Sward, op. cit., p. 32, citing Avery) with Hounshell, op. cit., pp. 220-221. There is, however, no doubt about the story's drift, nor about its import i.e. the particulars of Flanders's influence. See, e.g., Seltzer (1928), p. 95.

⁵⁴ He knew about the American System but does not seem to have stayed long enough to do much about it for Ford. See Hounshell, op. cit., p. 226.

⁵⁵ Thus a Michigan State Department of Labor survey in 1910 discovered that the industry's employment was 75 percent in skilled jobs. See the Department's [28th] Annual Report for 1910, pp. 475-476.

assemblers this involved brought with them much scope for variation in the pace of each assembler's output.

Around 1910, Ford's engineers began redesigning their manufacturing operation in a really thoroughgoing way. This effort had two distinct parts, the force of which together was to do away almost entirely with this artisanal independence. First, the engineers tried to bring to auto production the American system of standardized, interchangeable parts originally developed in the Federal armories. (The Army had wanted interchangeable parts so as to be able to scavenge in the field. Ford wanted interchangeable parts so as to have no need of highly skilled fitters.) This sort of production of parts identical down to extremely small tolerances often required developing new techniques and tools as well as new conventions of work. What was not already available seems to have been invented--by a corps of talented and soon renowned Ford engineers--as required. The second sort of innovation was bringing the work to the men rather than vice versa. This began with a spatial reorganization of the workspace and gravity slides to aid progressive assembly of relatively small components and sub-components. These fragmentary and wholly unmechanized schemes radically improved productivity in the shops in which they were tried, and the engineers were soon on the hunt for better ways to exploit the basic idea. Their attempts moved from having the workmen push the work-in-progress along a track to the different work stations through crude mechanical devices to pull the work-in progress

along, the workmen walking along beside, to the now familiar scheme of stationary workmen and mechanically moved work-in-progress.^{56 57}

The gains in throughput were enormous. The first line was for magneto assembly. The time input for each started at twenty man-minutes. The first line dropped it to thirteen. After raising the height of the line, installing a continuous chain to do the moving, and extended tinkering with the exact number of workers, the time was whittled down to five.⁵⁸

For a considerable period these experiments went on only with the assembly of components. When the technique was eventually tried on the car's final assembly, the need for regularity and co-ordination in absolutely all the subsidiary processes became unavoidably clear. But given careful planning, the technique would certainly work. The only real news in the results of the first moving assembly line for the chassis--the all but final stage--was exactly how low construction time per unit could drop.

⁵⁶ Conveyers had been used before this in the manufacture of small products. But no one had tried before to use them for anything so large, or complex, as an automobile. See Bornholt Interview, p. 3.

⁵⁷ In all of this, the distances the work actually moved dropped notably.

⁵⁸ Hounshell, op. cit., p. 248.

Static assembly time was roughly twelve and a half man-hours. Walking workers, with parts laid out for them as required along the way, the cars being moved along by a windlass rope, got this down to five hours and fifty minutes. The first pass at stationary workers (but still with a relatively coarse division of labor) got it to just under three. Making the division of labor finer and lengthening the line got two hours thirty-eight. An endless chain and tinkering with line speeds, the height of the line, and the division of labor came next, all this, in the words of one participant, "calling for patient timing and rearranging until the flow of parts and the speed and intervals along the assembly line meshed into a perfectly synchronized operation."⁵⁹ By late 1913, the technology was spreading fast throughout the plant.⁶⁰ By the following April, chassis assembly time was down to ninety-three minutes and three big lines, installed before New Year's, were in full and fully satisfactory operation.⁶¹ Further work on sub-assemblies got this down, on an experimental basis, to twenty-six and a half minutes by June and July. Then came conveyor belts, and the thing was a bolted-down institution. A year after the first moving line was installed, all assembly operations in the plant had been organized on a line basis. Even in the interim, one feels safe in surmising, demands

⁵⁹ Sorenson (1956), p. 131.

⁶⁰ Bear in mind how this timing relates to that of the turnover volumes: this is just the period when turnover, after its October pause, took off again.

⁶¹ Hounshell, op. cit., p. 255, Sorenson, op. cit., p. 131.

on that production work which was not strictly on a line basis were nonetheless driven by the need to keep the line fed smoothly.⁶²

The labor process at Ford was undergoing, in all of this, two major changes. The balance of skill requirements needed from the labor force was shifting radically. (See Table 13.) Those whose work drew on the training of skilled workers--those using the skills of trades which required apprenticeships--were a fast shrinking part of the labor force and in the new regime were much more commonly occupied making dies or other production machinery than making cars.⁶³ But what the statisticians counted as unskilled work--moving and lifting, sweeping up, and the like--was not greatly on the increase either. What was on the increase was machine-minding and physical assembly on a production line. The engineers had fragmented and routinized all these jobs, made the jobs suitable for machines. The engineers were not yet able to make such machines. But job content suggested they might as well be.

⁶² See, e.g., Sorenson, op. cit., p. 125. See also the quotation from Madison, op. cit., in Section 8 below and the text to footnote 67 below.

⁶³ At the volumes in question, the general purpose machines could be continuously employed at a single task. (See Babcock (1917), p. 125.) But in those circumstances, it was cheaper to use a single-purpose machine and the less expensive labor required to run it.

Table 13: Skill mix of jobs
in the Detroit metal trades and at Ford:
1891-1917

	Detroit metal trades: 1891	FMC: 1910	FMC: 1913	FMC: 1917
Skilled workers 21.6	39.8		31.8	28
Semi-skilled workers 62.0	30.6		29.5	51
Unskilled workers	29.6	38.6	21	16.4

Source: Gordon, Edwards, and Reich (1982), p. 133 (summarizing--
more neatly--other published data).

In machining operations, the design of machine tools made all work basically similar. The worker inserted a piece in the machine, threw a switch, and removed it. The work task and routine involved little thought or judgement, simply the rapid repetition of the same operation. Moreover, if he changed machines, he might have to relearn how to locate a piece, but his routine would quickly become monotonous. In assembly operations, the subdivision of labor and the mechanical movement of materials created similar conditions. In both instances, work lost its mental content and became a purely manual activity. The traditional notion of skill contained an intellectual element. The worker needed thought and judgement to perform his varied tasks. Now, skill in work required only physical attributes.⁶⁴

Arnold and Faurote wrote:

As to machinists, old-time all-around men, perish the thought! The Ford Company has no use for experience, in the working ranks, in any way. It desires and prefers machine-tool operators who have nothing to unlearn, who have no theories of correct surface speeds for finishing, and will simply do what they are told to do, over and over again, from bell-time to bell-time.⁶⁵

The second major change concerned the pace of repetition. This has two distinct aspects. As the operations of assembly become more routinized, they also became more regimented. "The co-ordinating [sequential] flow of work made virtually all the processes technically inter-related."⁶⁶ Ford later wrote

⁶⁴ Meyer, op. cit., p. 36.

⁶⁵ Arnold and Faurote (1915), pp. 41-42.

⁶⁶ Lazonick (1983), p. 122.

"[Our] organization is so highly specialized and one part is so dependent upon another that we could not for a moment consider allowing men to have their own way. Without the most rigid discipline we would have the utmost chaos."⁶⁷

And the pace was increased. Chart 1 plots a three-month moving average of throughput rates. There is a pronounced seasonal pattern, but equally pronounced is the steady march upwards of the whole.

This increased intensity of factor utilization had the natural consequences. "[Unit] costs fell two-thirds in a single period of six months, with the same machines, the same small tools, the same men--seemingly nothing to decrease labor costs."⁶⁸ Ford said that people just spent less time walking--and standing--around. As with many of his public utterances, this seems true but only part of the story--the earliest efficiency wage theorists would have said the workers spent less time recuperating from bursts of exertion. Whichever, the pace and timing of effort now lay neither with them nor with the foremen but rather with the management. The usual phrase, half metaphor and half literal, is that work became machine-driven.⁶⁹

⁶⁷ Ford (1922), p. 111.

⁶⁸ Lewchuk (1985), quoting a flier advertising Ford Methods and Ford Shops from the Detroit Public Library Archives. Even if the quote involves some exaggeration, it makes the point.

⁶⁹ This suggests an interesting point about Taylorism (and brings clearly into focus the utopian strain in Taylor's writings). Taylor took production hardware as given and sought revisions in labor practices and the organization of work. If only craftsmen would yield up their work secrets and allow themselves to be

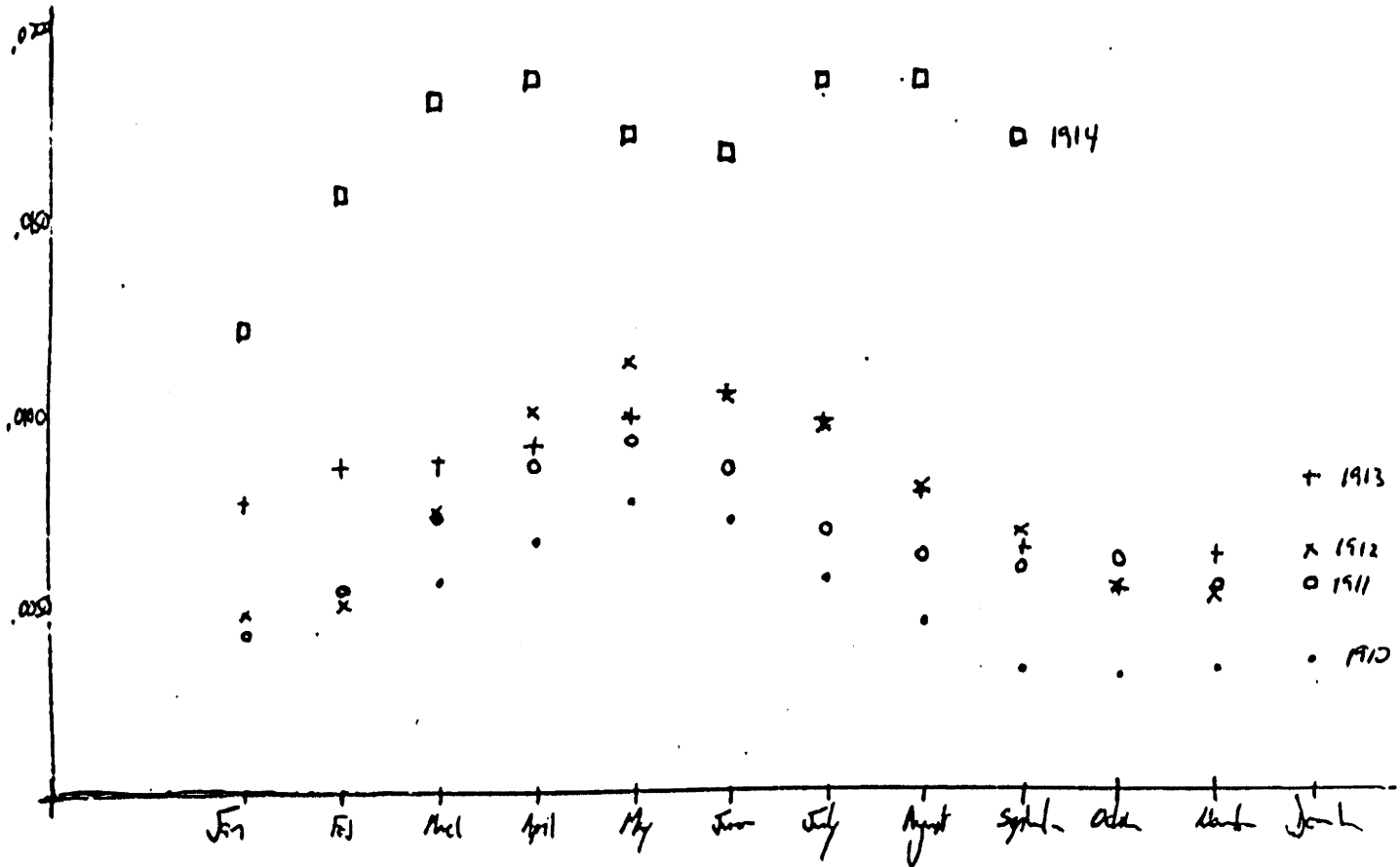


Chart I: Three-month moving averages of throughput rates
 January 1910-September 1914

Source: See notes to Table 9,

Though time and motion studies may have been employed in the set-up of the machines or the machine process, the machine [itself] ultimately set the pace of work at Ford, not a piece rate or an established standard of a 'fair day's work'. This was the essence of the assembly line and all the machinery that fed it.⁷⁰

In Ford's pithier phrase, "We regulated the speed of the man by the speed of the machine."^{71 72}

directed by engineers and their work routinized--though still done by their own hands--there would be much more enterprise surplus to be shared round. Since the technocrat planners would make sure the sharing was fair and involved no more than an honest day's work, of course all the workers would want to cooperate. The workers were suspicious; and they were, to Taylor's surprise as well as frustration, extremely uncooperative. (See Aitkin (1960), pp. 135-185.) At Ford, the engineers took less for granted all ways round. They had a product the specifications of whose parts were fixed to an unprecedented degree. So they designed machines to perform most of the in fact repetitive work, hired laborers to feed the machines, and then ran the whole at the pace which suited not flesh but metal. The outcome must have seemed worse than the most extreme fears of Taylor's craftsmen.

⁷⁰ Hounshell, op. cit., pp. 252-53. This does, of course, raise the question of what determined the speed of the line. Was it technical and logistical considerations alone? I suggest some answers in Sections 7-10 below.

⁷¹ Ford (1931), p. 39.

⁷² Arthur Feiler, the editor of the *Frankfurter Zeitung* made a trip to America post-World War I and wrote a book for Europeans on what he saw. In a chapter called "The Conveyer System," he writes thus (Feiler (1928), pp. 138-139).

In Ford's plant, wages are paid on a hourly basis and, contrary to the practice in many branches of industry, piece work has not been introduced. I asked an engineer in the Ford plant how they managed without it. "Well," he answered with a significant smile, "we have found a system which is so stimulating to labor that we do not need piece work. We have introduced piece work paid on the hourly basis, as it were. You will understand what this is when you have gone through the plant." And I did understand it after I had seen the conveyor system at work.

Perhaps this offered a temptation, perhaps merely an opportunity. William Klann, the Highland Park head of Motor Assembly recalled

Just keep [the men still and the work] moving all the time. That is where we saved out time The men didn't like it because they had to work harder. The pieces were there [before them] and they didn't have time to walk back and take a rest in between.⁷³

The workers certainly did claim they put out more effort, and there can be no doubt they completed more work. The data of Table 14, from which Chart 1 derived and which I will consider in detail in Section 8 below, confirms this.

The co-ordination of material flows which this increase drew on required considerable experience of planning. But the company had plenty of that by this time, for even static assembly of chassis in the numbers attained in the previous facility on Piquette Avenue facility had required it. There rows of chassis would be laid out, assembly gangs moving among them, parts arriving at roughly the right time without causing counter-productive clutter. A total of 600 workers were involved--500

⁷³ Klann, p. 52.

Table 14: Monthly orders, production, and production labor hours at Ford, 1910-1914

Month	(i)	(ii)	(iii)
January 1910	1 266	1 203	244 365
February	1 195	1 933	256 529
March	4 136	2 658	338 020
April	5 110	3 618	453 249
May	2 485	3 650	513 134
June	1 343	2 467	392 936
July	749	768	218 874
August	806	746	198 473
September	549	410	175 843
October	925	782	244 839
November	1 073	1 213	291 129
December	1 994	895	328 555
January 1911	2 084	2 028	360 342
February	3 549	3 112	415 875
March	6 005	4 699	554 551
April	5 762	5 332	569 139
May	7 812	6 096	622 215
June	4 253	2 830	465 032
July	1 953	1 606	363 843
August	2 042	4 506	572 254
September	1 424	2 404	511 148
October	4 080	3 164	575 165
November	3 101	3 358	603 840
December	4 991	2 878	586 806
January 1912	3 144	2 286	651 859
February	6 279	4 165	659 668
March	13 658	9 605	810 849
April	13 270	10 003	859 139
May	14 639	9 688	952 930
June	5 221	8 078	876 520
July	6 244	8 159	892 801
August	2 377	4 063	834 566
September	3 244	4 191	784 009
October	13 311	5 264	1 111 926
November	14 389	5 685	1 113 218
December	12 799	11 301	1 323 091
January 1913	22 208	17 489	1 902 361

February	30 303	13 987	1 775 031
March	40 396	17 477	2 003 188
April	30 239	22 001	2 107 608
May	4 783	21 401	2 147 509
June	324	22 181	2 049 516
July	8 363	14 939	1 886 243
August	8 310	7 640	1 611 934
September	7 988	8 724	1 323 819
October	84 895	7 334	1 619 961
November	43 262	11 021	1 470 701
December	22 192	15 410	1 520 857
January 1914	6 637	24 391	1 515 020
February	11 778	24 557	1 378 720
March	35 416	28 643	1 426 310
April	31 711	22 271	1 263 281
May	11 746	12 976	763 184
June	5 550	13 318	733 925
July	4 703	*12 690*	557 047
August	10 226	12 061	884 121
September	6 729	16 488	1 155 962

Column (i) gives orders received over the course of the indicated month. Column (ii) gives production that month. Column (iii) gives hours of productive labor. All three of these series come from materials in Accession 922 in the Ford Archives. [One monthly output figure was missing in that source. I have interpolated a value for the Table and set this number off with asterisks. The labour figure for that month is as my source gives it.]

One could calculate a series of output per production manhour i.e. throughput by dividing each entry in Column (ii) by the corresponding entry in Column (iii). The result is a little noisy, but a three-month moving average of it (in which the figure recorded for March is the average of the ratios for January, February, and March) makes the general pattern ineluctably obvious. The timing also corresponds quite neatly to the history as I have pieced it together in the text. [I should note, lest cynics presume otherwise, that this particular moving average was the only data simplification I tried.]

Comparing this series with that in column (i), it appears that throughput was demand-driven. This is certainly consistent with the observation that the Highland Park plant had, for practical purposes, no place but the street outside in which to store finished output.

Source: Model T Production Statistics, Ford Archives Accession 922 (which run 1910-1948 with occasional months omitted.)

assembling, 100 carrying parts.⁷⁴ The building had not been a large one.⁷⁵

It is worth noting in closing this discussion of the underlying technology that the Highland Park routinization made catching isolated stragglers easier. "The inefficient or malingering worker ... did not have did not have the same rhythmic movements as the other members of the shop."⁷⁶ Neither did the flow of his output. Inputs piled up at his work station. "The supervisor could look down the line and tell at a glance whether there was trouble and if so at what operation. Wherever the stock backed up on a rollway was a troublespot."⁷⁷ A contemporary noted, dryly, that "Substitutes were kept constantly on hand, at the factory's expense, to meet all emergencies."⁷⁸ Every Ford worker was "perfectly aware that he [was] under constant observation and that he [would] be admonished if he [fell] behind the fast pace of the department," observed the primly admiring Arnold and Faurote.⁷⁹ One is not surprised to read an industrial journalist conclude "There is mighty little chance for the shirker to persist in the Ford plant even though the entire force is paid on a daywork basis."⁸⁰

⁷⁴ Hounshell, op. cit., pp. 249 and 374.

⁷⁵ Ibid., p. 220.

⁷⁶ Meyer, op. cit., p. 59.

⁷⁷ Heliker, p. 85.

⁷⁸ Martin (1915), p. 8. It would be interesting to learn more about how surveillance, and inspection, were physically carried out and how the system evolved or shifted.

⁷⁹ Arnold and Faurote, op. cit., p. 247.

⁸⁰ Porter (1917a), p. 644.

6. Some provisional answers

What was really determining wages? A systematic approach to the efficiency wage question is helpful here. Each of the theories has, as has been noted, falsifiable implications which can, in principle, be investigated. This section begins by considering what the surviving evidence says about the turnover, moral hazard, and adverse selection theories.

In the turnover model, labor becomes more productive by not leaving (or, more precisely, by not dissipating the investment in training). To rationalize Ford's increased compensation on these grounds, the company's turnover costs have to fall by a commensurate amount. One can assess the size of this fall in a crude way by putting numbers to an expression for the user cost of labor,

$$c = w + (i+q)T.$$

Here w is the wage, i the relevant interest rate, q the turnover rate, and T the training costs. The crucial question is whether the decline in q associated with the five-dollar day made the second term shrink enough to reduce, on balance, the total cost.

Since we have w on a daily basis, we want i and q stated that way too. On a daily basis, any reasonable annual i is for practical purposes zero. Putting the annual turnover rates for 1913 and 1914 (see Table 4) on a daily basis, we get a change of q of 1.04 percent. All now turns on the size of T .

The subject of training costs and turnover was much discussed throughout the decade in question.⁸¹ The most widely cited quantitative study is that of Magnus Alexander, a General Electric executive. Writing for a trade journal in 1914, he considered the matter quite carefully and surveyed contemporary metal-working and manufacturing firms. He broke the overall costs down into clerical costs, wear-and-tear, loss due to reduced production, and spoiled material; and he estimated the extent of each of these for four different classes of workmen. He concluded that these costs were about \$8 for someone doing unskilled work (i.e., in this case, work without tools which might be misused or, through inexperience, underutilized) and about \$70 for someone doing fairly skilled work. (Operatives whose time on probation ran between one and three months he put in between, though much closer to the latter.) Keeping these figures in mind as rough guidelines (though bearing in mind that they derive from relatively more skill-intensive production processes), how do the numbers look at Ford?

⁸¹ For one well-known qualitative analysis, see Fisher (1917).

There will be two parts to T: getting the worker onto the shopfloor and training him to standard. We could get some impression of the costs of the first from Chapter 2 of Arnold and Faurote (which details the process and the information taken) and an estimate of the costs to the company of the time of the doctor and clerks.²² But luckily we do not have to do anything so detailed. The company itself estimated the time at two hours and ten minutes, and from contemporary data we can put the expense of this for all persons involved at something like a dollar.²³ The long and the short of this is that these first costs seem likely to be quite small. Are the training times another matter?

We might start with a participant's observations.²⁴

²² The doctor seems mainly to have checked for infectious diseases and obvious disabilities. (See Arnold (May, 1914), p. 187.) The clerks only filled out forms and dispatched workers to the foremen who had been allocated more hands of the relevant description. On the forms and the procedure, see Arnold and Faurote, op. cit., pp. 31-61 passim.

²³ The employee's time cost just over fifty cents, and some of this would have been for time spent walking or waiting. Only the doctor would have been paid even as well as the employee. (Ford's contempt for administration--when real economies had to be made after the war, the first things to go were white-collar employees' desks and only then their jobs--extended to pay scales for secretaries and most white-collar employees. "He always figured you didn't need an office," record the Reminiscences of George Brown (rough draft, p. 118), originally hired as a clerk. "Mr. Ford not being an office man, he didn't understand the routine." Nevins and Hill (1957), pp. 158-159, discussing the company's response to a post-war crisis, begin an anecdote with the phrase "Ford, who had always regarded the office force with an executioner's eye ... as mostly parasitic ...")

²⁴ This observation was in fact offered roughly a decade later than the events I am discussing. But the technology had not changed significantly in the interim.

Division of labor has been carried on to such a point that an overwhelming majority of the jobs consist of a very few simple operations. In most cases a complete mastery of the movements does not take more than five to ten minutes. All the training that a man receives in connection with his job consists of one or two demonstrations by the foreman, or the workman who has been doing that job. After these demonstrations he is considered a fully qualified 'production man'.⁶⁶

A colleague put it more bluntly.

This was a fast line and every operation was simple. I was 100 percent efficient one minute after I started.⁶⁶

Arnold and Faurote quote the Highland Park plant superintendent bragging in 1914 that

[I]f an immigrant, who has never even seen the inside of a foundry before, cannot be made a first-class molder of one piece only in three days, he can never be any use to us on the floor; and two days is held to be ample time to make a first-class core-molder of a man who has never before seen a core-molding bench in his life.⁶⁷

The speaker is referring to a specialty which required sufficient skill--in the absence of so radical a division of labor--to have sustained a craft union in the Detroit metal trades for as long

⁶⁶ Cited in Meyer, op. cit., p. 41.

⁶⁶ Ibid.

⁶⁷ Arnold and Faurote, op. cit., p. 41. See also Ford (1922), p. 79.

as any survived at all."⁸⁸ Ford's chief assistant told an investigator from the Commission on Industrial Relations visiting just after the announcement that the company could "teach [a new employee] all that is required in two days."⁸⁹ This all sounds much more like Alexander's cheapest category--"[those] who can be let go today and replaced by others tomorrow without great loss in the efficiency of work."⁹⁰ It certainly doesn't sound like one to three months of serious training, let alone three months to a year.⁹¹

These vignettes are just a slightly more extreme version of a survey, conducted several years later but for all practical purposes about the same production process, of some 4032 of the 7882 distinct jobs (tasks) in Ford production.⁹² The subject of the study was the ability of the Ford Motor Company to make use of partially or severely handicapped individuals in production jobs. The sorts of handicaps under consideration ranged from one or more amputated or hopelessly crippled limbs, partial blindness, and the like, to deafness and hernia. The author first discovered that some of these people could in fact do heavy work the company needed done. Others could not do light work the company required. So the jobs had to be surveyed one by one. It

⁸⁸ Nevins, op. cit., pp. 377 and 379.

⁸⁹ Speck (1914), p. 9.

⁹⁰ Alexander, op. cit., p. 1032.

⁹¹ Lescohier (1919), pp. 252-253, says of this technology that "...most Ford employees are laborers or at best semi-skilled."

⁹² Mead (1919), pp. 5-6.

is clear that though many of the jobs identified had no real skill requirements, a number surely did. In passing, the author classified the jobs according to the time required for proficiency. The tabulation is interesting. The distribution is extremely heavily skewed towards the short end. Table 15 gives the particulars.

The first two entries, covering all the jobs which can be mastered inside of a week, come to 79 percent of the total. It is not possible now to reconstruct the extent to which the distribution of training times within this subset of jobs exactly paralleled that of the whole population of jobs. Similarly, there is essentially no positive data to say that any one of the survey's job categories saw faster turnover than any other. But with most of the plant on deskilled production jobs or assembly and a large fraction of the remainder at common labor, this percentage makes Alexander's estimates of the costs of training per se for his semi-skilled jobs i.e. two weeks and more of the workers' time look very high for the average member of the Ford workforce. Furthermore, there is reason to infer that the turnover was in fact concentrated among the unskilled and the semi-skilled. The famous five dollars was only a minimum wage. Skilled employees had been getting nearly that much to begin with.* They were paid more than it thereafter, though their

 * See Table 5 above.

Table 15: Training times for a large sample of jobs at Ford

Number of jobs	% of jobs sampled	Est. time reqd. to train to proficiency
1 743	43 %	One day or less
1 461	36 %	One day to one week
251	6 %	One to two weeks
534	14 %	One month to one year
43	1 %	One to six years

Source: Mead (1919), pp. 5-6. (The last entry comprises "skilled trades, such as tool-making and die-sinking.")

raise was smaller, in proportion, than that the less skilled obtained.*'

For a first cut, then, it seems reasonable to assume that turnover among the really skilled workers had already been attended to and was not the issue. If, just to fix ideas, Table 12's first three categories (covering 85 percent of the total) are valued at the upper extreme of their interval and the other two are just ignored, the average training time being lost comes out at 3.31 days. If, more conservatively, all five categories are given some weight but at their minima instead (the top two maxima seem on the basis of my reading unrealistic, and they drag up the average violently), the average would be 8.12. On my view of the technology, this is not an unreasonable approach. Grinding through the calculations, these two values for T yield cost savings of \$0.17 and \$0.43, respectively. Even allowing for the fact that after a time workers did not start earning at the five-dollar rate until six months after they had started and that some workers were for one reason or another ineligible for the scheme, it is difficult to ignore the fact that these numbers represent a range of from 6 to 16 percent of the increase in the wage cost. Those are very small fractions. Even the most dramatic, and therefore favorable, turnover falls cited in the

 *' See Table 6 above. For a size distribution, see the list giving the number being paid each wage paid to anyone in the factory in February 1914 in Ford Archives Accession 940, Box 16.

popular literature do not suffice to change this picture significantly.

The situation is actually worse for the turnover hypothesis than these calculations suggest. Interpreting the raw turnover rates for this period is not an entirely straightforward exercise: labor market conditions seem to have been changing significantly during the interval. Slichter, in a discussion of the sensitivity of turnover rates to the business cycle, cites data to suggest that annual rates in that time and region often dropped by between one-half and two-third between 1913 and 1914.⁹⁵ This suggests that choosing the q's in the calculation to show the ex post change gives the company too much credit. A lot of that change probably had nothing to do with the wage rise, however large the remnant in absolute terms. Conservatively assuming the least unfavorable of Slichter's extremes, the fractions still shrink by one-half. What was small becomes tiny.

It must be said this calculation may be a little facile. It casually assumes that each worker was trained only once. Yet with 10.5 percent absent each day--in late 1913, upwards of 1300 men--and a convention that the absent had to miss five days running before they were deemed to have quit, it is clear that at least some workers learned more than one task. It is not clear

⁹⁵ Slichter (1921), p. 32, summarizes (research he conducted for the Commission on Industrial Relations).

from the surviving records what the most accurate way of modelling this excess training would be. Mead's later survey did find 7000-odd different jobs. I strongly suspect that a great many of these jobs differed chiefly in location in the plant or in the diameter of the bolt in question and would not pose any serious challenge to many who had been trained for some other job in the plant. But the plant employed most of 14,000 production men. At least in a very literal sense there was probably a significant amount of slack competence at any time. Still, my reading of the contemporary literature on changes in job content suggests that the training costs will have mainly been first-time costs, as much about the discipline of the line as anything else. All things considered, this seems unlikely to be an important qualification.⁹⁶ Reducing turnover costs remains an unlikely central motive.

I should add that it would also be interesting to examine a time series of monthly turnover or separation statistics for 1913 and early 1914 from this perspective. George Heliker, the research assistant to Nevins responsible for labor matters, believed that the turnover problem was disposed of by the October 1913 reforms, months before the five-dollar day was even

⁹⁶ Note well that I have been treating turnover as a problem in itself. It could be a sign rather than the thing itself. See Section 9.

contemplated.⁹⁷ Certainly in January Ford and Couzens averred a very different motivation for the decision to raise the wage.⁹⁸ Unfortunately, neither the Ford Motor Company nor any journalist or scholar has published turnover data showing this period in any detail. Tables 3 and 16 show all that is known. Turnover and absenteeism fell a lot. But the precise timing and the details of influence are hard to pick out.

The 'shirking' explanation looks at least superficially more promising. Here, labor becomes more productive by working harder i.e. by expending more effort. In the period under discussion at Ford, the jobs in question would by and large have been highly routinized when not actually on an assembly line. So consider, in neoclassical paradigm, a particular part of the car passing by a particular worker at regular intervals. The worker is to

⁹⁷ Heliker, pp. 25-31. [This is uncritically summarized in Nevins, op. cit., p. 537.] Hounshell, as cited above, disagrees; I have also given evidence above from the Directors' Minutes (see footnote 31 above) which casts serious doubt on this view. So does examining the source cited in Heliker's crucial footnote 68 in the context of "Model T Production Statistics" and this essay's Appendix II.

⁹⁸ That is, distributive justice. "'We believe,' Mr. Ford said, in making 20,000 men [sic] prosperous and content rather than ... making a few slave drivers in our establishment multimillionaires." ("Workers Get \$10,000,000 of Ford's Profits This Year," *Detroit News*, January 5, 1914, p. 2.) ("That the purpose of the plan is to reward the 'underdog' ... [was] made clear by ... Couzens [at the press conference].") ("The Men Behind the Guns [sic]," *Detroit News*, January 6, p. 2.) Less exalted Company spokesmen also often spoke the language of simple altruism. "The Ford Motor Company gives its employees five dollars a day so they can get away from slums and tenements ..." read one brochure. See Nevins and Hill, op. cit., p. 338.

Table 16: Absenteeism statistics

	Total Workers	Number Absent	Percentage Absent
October 6, 1913	12 548	1 250	10 %
October 6, 1914	12 645	311	2.5 %

Source: Abell (1915), p. 37.

perform some operation(s) on it--tightening some group of nuts, for instance. Working at capacity means tightening all of the nuts all of the way all of the time. 'Shirking', or otherwise falling behind the line's norm, means missing some out sometimes i.e. uneven execution.⁹⁹ There certainly was, in principle, scope for this. The question is whether, as a practical matter, such behavior by an individual could escape detection. The relevance of this explanation turns on there being lots of scope for untraceable (or, at least, hard--that is, expensive--to monitor) nonfeasance.

Unfortunately, no statistics on defective operations, let alone the means to study them controlling for line speed, seem to have survived. It is clear there was on-line inspection and that operating tests were done prior to shipping.¹⁰⁰ In general, it is clear that management placed some value on the quality of factory output. I found no references whatever in the archival or secondary sources (including trade journals oriented to technical and retail audiences) to trends or patterns in this. The simplest conclusion is that there weren't any.

Supervisory intensity is another matter. Here we can indeed form a crude time series. In 1914, Arnold and Faurote visited the factory and found foremen directing workers in an average

⁹⁹ Again, see Matthewson, loc. cit.

¹⁰⁰ See, e.g., Arnold and Faurote, op. cit., pp. 97-101.

ratio of 1:53.¹⁰¹ In 1917, documents in the Ford Archives suggest, the ratio was roughly 1:15.¹⁰² This is clear and sharp if not quite as closely spaced as one might wish. But we also have direct testimony from the crucial period.

Martin, the plant superintendent, seems to have been opposed to the whole idea of the raise. In discussions with Ford and Couzens, he argued that the workers would do nothing by themselves.¹⁰³ Klann reports thus on the period shortly after the announcement and the meeting of instruction not long thereafter which Martin and Sorenson (the head of production) held for the foremen and supervisors.

We used ... our men pretty hard in those days. It was putch-putch in Polish; presto, Italian; mach schnell, German; and hurry up in English. That was all a fellow knew, just drive, drive, drive

To drive was to force the pace, walking the line paying the fiercest and most vigorous attention to subordinates' performances.

¹⁰¹ Arnold and Faurote, op. cit., p. 46 and "Model T Production Statistics".

¹⁰² The data come from "List of Trades and occupations," Ford Archives Accession 940, Box 16 and from "Model T Production Statistics".

¹⁰³ Sorenson, op. cit., p. 139. (Heliker's text corroborates this, the footnote referring to an interview with Martin himself.) According to Sorenson, Lee was opposed as well. So much for the idea Lee was putting about later (see Lee, op. cit.) that the October measures and the five-dollar day were all one plan.

[T]here was no rest period at all. They just had to work eight hours; that's all there was to it. We gave them a quarter of an hour for lunch and they couldn't pick at it. They just had to swallow it down [We were] one of the worst shops for driving the men.¹⁰⁴

The shirking model has a cross-sectional angle: firms with production processes in which supervision is relatively easier should offer relatively lower wages, *ceteris paribus*. I will argue below that the other things were not so equal. But I note in passing now that supervision was easier to do at Ford--shirkers were much more easily spotted--and the company was not paying lower wages.

I should add that the six-month probationary period is, in fact, just the sort of institutional feature this theory would suggest. So is the company's promise to donate the profit-share of any lapsed sharers to charity while they are given a second chance.¹⁰⁵ But this theory is not alone in predicting these.

It is important to be clear on two last points about this model. First, evidence that the job promised surplus to potential (marginal) employees is only evidence that the wage wasn't a market-clearing wage. It is not, in itself, evidence

¹⁰⁴ Klann, pp. 84-88.

¹⁰⁵ See Marquis (1916), p. 913. See also Ford Motor Company (1916), p. 6.

for the shirking model. The shirking model is about discretionary effort. It is hard to identify persuasive direct evidence about workers' effort levels. But the indirect evidence does not suggest workers had scope for autonomously working harder, let alone that they actually did so. A major purpose of the main technical change here was co-ordination. "The chain drive proved to be a very great improvement, hurrying the slower men, holding the fast men back from pushing work onto those in advance, and acting as an all around adjuster and equalizer."¹⁰⁶ The technological evidence thus certainly doesn't suggest management expected an autonomous surge.

Furthermore, the company didn't think it ever fired anyone. Bondie, at the time an assistant in the Employment Office, records in his *Reminiscences* that "[a]t one time it was generally known that if a man got a job at the Ford Motor Company he had a job for life, as it was the policy never to fire anyone if [it was] at all possible to keep him on."¹⁰⁷ Detroiters read in one article about the announcement that "[n]o man will be

¹⁰⁶ Arnold and Faurote, op. cit., p. 114. It is interesting that some other plants were assembling with moving assembly lines by 1913 but were using them solely as labor-saving devices i.e. neither to co-ordinate nor to control effort at directly productive tasks. See Lewchuk, op. cit., p. 88, and footnote 145 below.

¹⁰⁷ Bondie, *Reminiscences*, p. 11. He goes on to explain that there were some jobs people frequently quit. But he says this in diction suggesting this was not a strategem frequently, let alone publically, employed. See also Lee, op. cit., p. 301, and Porter (1917b), p. 264.

discharged ... except for unfaithfulness or proved inefficiency."¹⁰⁸ "The disposition of the company ... [is] to retain any man whose abilities are desirable and to offer every employee every possible chance of demonstrating his ability."¹⁰⁹ The shirking worker could well have understood that no shirking was beyond the making of amends.

Second, I have considered in this discussion the possibility and consequences of shirking as if its cost to the company were remaining constant. I have done this because the evidence on shopfloor organization and supervisory conduct suggest to me this sort of moral hazard was not a significant problem by the period in question. But profitability was indeed growing, and thus the opportunity costs to the company of disrupted production were certainly on the rise. I will return to this fact in a related setting which I take to be more cogent--in which the exercise of discretion is collective rather than individual--below.

This detailed examination of the two most obviously relevant theories is not encouraging. There is thus some point in considering other models as well. I begin with the other standard efficiency wage approach.

¹⁰⁸ "Henry Ford Gives \$10,000,000 in 1914 Profits to His Employees," *Detroit Journal*, January 5, 1914, p. 1.

¹⁰⁹ "New Industrial Era Is Marked by Ford's Shares to Laborers," *Detroit Free Press*, January 6, 1914, p. 1.

Quality section presupposes a production process in which ability (of some sort) and skill are valuable to the firm. Here the character of techniques, of technical change, and, for that matter, the intentions of the engineers and managers are relevant. There is a substantial--in both senses--literature on these topics, including the recent and important book by Hounshell and, on this in the context of larger issues, the essay by Lazonick. The import of it all is, as suggested in the previous section, that skilled work was being vigorously eliminated. Table 12 there, giving job skill distributions for jobs at Ford in 1910, 1913, and 1917, summarizes the trend quite neatly.¹¹⁰ To a first approximation, the company didn't want skilled workers for most of its jobs. It would therefore hardly have been willing to actually pay to find them. For what it is worth, the company also said as much.¹¹¹

This all may seem to put paid to the idea that Ford was raising wages to attract the "best" workmen. But as suggested above, matters might not be quite so simple. Perhaps the company wanted to select not for skill but for those whose would could adapt easily to the new control regime and would not find the mechanical pacing stressful. Yet why should this be? Workers

¹¹⁰ The evidence cited in footnote 94 above fits the Table's general pattern.

¹¹¹ See Abell (1914b), p. 306. The paragraph in question begins "The Ford Motor Company does not wish to change the present standard of labor employed."

not tolerating the discipline would matter to the company either because the people would leave or because they wouldn't leave but would instead stay and rebelliously misbehave. In the first part of this section I argued that the costs of turnover itself weren't nearly large enough to explain the wage rise. At the end of Section 5 and in the second part of this one I suggested that individual workers didn't have much opportunity to cause trouble. So there isn't much to this as a story about individuals. I will return to a different construal of it in Section 9.

My original objective was to identify a single theory as explanation for these famous events or at least to exclude several from the list of credible candidates. Superficial examination suggested that one of the standard efficiency wage theories might do the job. But the preceding closer look reveals that none of those theories--no version on offer now, at any rate--can. There is, however, at least one alternative, more in the spirit of Section 5 and also possessing falsifiable implications, which cries out for exploration at this point. Perhaps the jobs weren't really offering any surplus at all.

By early 1914 Ford knew perfectly well that he was offering the mass of his employees a different sort of employment than were the other auto manufacturers and engineering employers of the time. The contrasting line of argument says that he was offering a different wage-time bargain, but not a dramatically different wage-effort bargain. Well-informed people would work

in the jobs only if they were offered a compensating differential. It is surely plausible that Ford had to raise wages to accomplish this.

Ford certainly knew he was demanding more and more. He told reporters quite bluntly that he never gave anything for which he did not receive compensation.¹¹² Even Samuel Marquis, the welfare-oriented administrator of eligibility screening later in the decade who in the end quit his powerful and well-paid position when the hard-driving production managers began dishonoring Ford's official commitments to the well-being of the workers, wrote of a later wage rise thus.

If a man is paid six dollars a day in the Ford factory, he is expected to earn it and conveyors tuned to the six-dollar speed leave little to the will of the operators.¹¹³

He added, writing after his disappointed departure and to doubtless a little wistfully, "It's a great system, but it needs careful supervision by human beings." It is clear from the

¹¹² "Ford, Back from West, Still Bitter in Views on War," *Detroit News*, November 15, 1915. See also "Barber Tells Ford Scheme Sounds Fishy," *Detroit Free Press*, January 9, 1914, p. 3: "I don't believe in charity." Remember too that part of the five-dollar day package was the reduction of individuals' hours from nine daily to eight. The point of this was to allow a night shift, at a stroke expanding potential output from the fixed plant by fully one-third. The five-dollars was to include a premium for someone's having to do nightwork.

¹¹³ Marquis (1923), p. 95.

context that he felt Ford and those who ran the factories in his name had other views.¹¹⁴

Charles Morgana's memory--of events as seen from the Machine Tool Engineering Division, not the shop-floor--is vivid and to the point here as well.

In the early days of the conveyer system ... they carefully tested the rate. They screwed up the operation a little at a time, watching the results very carefully. It was surprising how much more work the men were doing before they noticed it.¹¹⁵

The growing turnover in late 1913, as the moving assembly line went in and throughput took off, suggests they did eventually notice.

Klann's report of the meeting between plant management and the foremen and supervisors shows this experimentation was not absent-minded puttering but part of a conception of a new equilibrium bargain. The passage quoted above continues thus.

[They] had called us in and said that since [the workers] were getting twice the wages, [the management]

¹¹⁴ The 'system' was, of course, the production process which was yielding up such vast distributable profits. For a poignant example of the attitude Marquis is complaining about, see Nevins and Hill, op. cit., pp. 349-350.

¹¹⁵ Morgana Interview, p. 5. Remarks on p. 3 of the Bornholt Interview suggest that Morgana here is talking about events after April, 1913.

wanted twice as much work. On the assembly lines we just simply turned up the speed of the lines.¹¹⁶

One wonders what precisely employed workers did make of the terms of work and compensation under the new regime. Nevins suggests they thought the "enterprise ... managed in their interest as well as that of the owners" and that they took pride in this membership in an "industrial elite".¹¹⁷ But his evidence--he cites wearing work-badges to dances and other social affairs--bears another interpretation.¹¹⁸ The wife of one of them certainly wrote Henry Ford in a rather different tone in late January.

The chain system you have is a slave driver! My God!, Mr. Ford. My husband has come home & thrown himself down & won't eat his supper--so done out! ... That \$5 day is a blessing ... but oh they earn it.¹¹⁹

And the skilled workers were not in fact free of this either.

"Where men were required to do 80 pieces in 9 hours, they are now required to do 100 in 8 hours"¹²⁰

¹¹⁶ At that time a large fraction of the employees in the factory were not yet working directly on a line. But, as I have noted above, the which pace management desired for their work would have been driven by the target line speeds.

¹¹⁷ Nevins, op. cit. (1954), p. 549. See Section 10 below.

¹¹⁸ See footnote 269 below.

¹¹⁹ Unsigned longhand letter addressed to "Mr. Henry Ford, Edison Ave., City" (i.e. Ford's home), dated January 23, 1914. Ford Archives, Acc. 1, Box 126. Emphases as in original.

¹²⁰ Industrial Union News, February 1914, p. 1. For more details, from someone who was actually there, see Madison, op.

In the context of this sort of evidence, it is interesting to contemplate the responses to the Ford Motor Company's announcement from local competitors. An article in the *Detroit News* article adjacent to the one covering the Ford announcement, quotes Fred Vollbrecht, the treasurer of another Detroit auto manufacturer thus.¹²¹

The Ford plant can only give employment to so many men and after that the others will have to seek employment in other plants at the prevailing wage.

Most secondary sources cite this remark. They consistently take it to mean that Ford's wage dominated the wage-effort bargains available elsewhere in the city. Vollbrecht is saying to the man with the Ford job "Lucky you!". But seeing the article whole suggests he had something else in mind. He also said the following.

The action of the Ford people will have little effect on us I believe all the auto factories in the city will run along in the same groove We are paying quite a bit more to our men than the Ford plant has been and do not think we will lose one employee to [them]. I do not think the action of ... Ford will cause wages to be ... raised in other ... plants.

 cit., quoted at length in Section 8 below.

¹²¹ See "Other Auto Men Say They Do Not Expect To Be Affected," *Detroit News*, January 6, 1914, p. 2.

A different but equally plausible interpretation of these words is that Ford was offering a different bundling of time and money but an identical bundle of effort and money, and--if it mattered--even less scope for the exercise of skill and any sort of autonomy.¹²²

Knowledgeable workers wouldn't want the shift, this all suggests--they were already getting comparable wages given what they actually did on the job.¹²³ It might be that some people would want to put out and be paid for more effort than the common institutional arrangements were then set up for.¹²⁴ Such people would be indeed be rationed: there weren't more jobs with Ford's gross daily wage on offer because strategic decisions (intended to be profit-maximizing, whether or not they turned out to do so) made by the other employers had led to a state of affairs in which only Ford conducted auto manufacturing with techniques such

¹²² It is worth expanding on this second point. Were the others actually paying 'quite a bit more'? Their technology was little changed from 1910--see pp. 105-106 and footnote 145 below--and so their employees would overwhelmingly have been at skilled tasks. The five-dollar day did not involve substantial raises for skilled men--who were already earning very nearly five dollars a day in any case. (See Table 5 above. See also *Motor Age*, January 8, 1914, p. 54.) By that time the Ford operation had a distinct but quite limited need for such skills. In any case, those men too were now more and more being driven at Ford.

¹²³ So it is not just that they would not join the queue. They would not stay put and agitate for higher wages either. They understood the terms of their drawing the compensation they did.

¹²⁴ Madison, who then working as a machinist and quoted at length below, would have put himself in this category.

that the labor time was worth that much. But he seems to be saying that the work force in the rest of the industry was by and large quite happy with the wage-effort bundling their employers did offer. From their perspective, the wage rise only brought Ford up to par. It was all the same to them now, and so the main consequence of the rise would be that workers wouldn't leave Ford plants so casually any more. But who would positively want the jobs? Perhaps those locally employed outside the industry (by far the most prosperous in Detroit), but chiefly those ignorant of what they getting into and those not employed at all.¹²⁵ Contemporary reports are thick with evidence of the interest of the latter two groups.

¹²⁵ On the distribution of prosperity inside and outside Detroit, see Nevins, op. cit., p. 542.

7. Outside the factory

How plausible is this story? Are there facts which at once support it and speak against the efficiency wage theories? To answer these questions one needs to know something about conditions in the local labor market at the time. That information is not so easily come by, for the period long predates systematic statistics about employment and related labor supply decisions. But archival sources turn out to yield enough information to piece together a fairly clear--even vivid--picture. I will begin the story at the beginning, with a discussion of the historical formation and evolution of the relevant markets. This makes it easier to understand the state of the labor market at the moment in question.

The city of Detroit had its commercial start in an earlier age: it offered access through a protected harbor which let out from Lake Erie onto Lake Huron and a back-country rich in furs, timber, and minerals, and easily capable of supporting prosperous agriculture. From this, particularly after the opening of the Erie Canal, came vitality as a trading center and, in due course, a substantial population. But the real expansion of its population and trade started only in the late nineteenth century. For reasons which remain obscure but surely have immediate roots

in large local industries building stoves, wagons and coaches, railroad cars and steam engines, and marine engines, the city had lots of mechanical talent and several nationally prominent firms making tools and light machinery.¹²⁶ Thus in the late nineteenth century the city developed traditions and resources in the major metalworking crafts. By the time of the 1900 Census such engineering work was itself the largest sector of the local manufacturing economy. Table 17 gives some sense of this history. The first production of automobiles in substantial quantities came at the Olds factory from 1903 to 1905. By 1910--well before mass production in any precise sense could be said to be under way--total automobile output was already virtually exploding and the industry, with all its linked supplier industries, had become without serious question the leading sector in the local economy. By the end of the decade its position was extremely firmly established, in the state as well as the city. (See Table 18.)

The striking feature of both these sorts of outputs, given the production techniques in general use circa 1910, is how dependent output was upon craftsman's skills. In other sectors (bicycles, sewing machines, furniture), and so in towns whose economies were dominated by them, production via the American System may have been popular; but in Detroit industry methods

¹²⁶ Nevins, op. cit., pp. 120-121. There also seems to have been some bicycle trade. See Hounshell, op. cit., p. 369, n. 68.

Table 17: Detroit's leading manufacturing industries, 1890-1920

190	Total value of manufacturing	\$ 1 789 000		
	of which:			
	Steam railroad cars	24.5 %		
	Carriages and wagons	9.8		
	Foundry and machine shop products	8.8		
	Shipbuilding	3.7		
	Flour and grist mill products	3.2		
	Slaughtering	3.1		
	Boots and shoes	2.7		
1900	Total value added by manufacturing	\$ 41 359 000	18.3 %	
	of which:			
	Foundry and machine shop products	10.7		
	Tobacco manufacturing	9.2		
	Slaughtering &c.	9.0		
	Patent medicines &c.	6.5		
	Printing and publishing	4.9		
	Malt liquors			
1914	Total value added	\$ 179 100 000	35.2 %	
	of which:			
	Autos, incl. bodies and parts	6.1		
	Foundry and machine shop products	5.4		
	Tobacco manufacturing	4.3		
	Patent medicines &c.	3.9		
	Malt liquors	2.3		
	Stoves and furnaces			
1920	Total value added	\$ 578 600 000	38.3 %	
	of which:			
	Autos, incl. bodies and parts	6.2		
	Foundry and machine shop products	3.8		
	Engines (steam, gas, etc.)	3.5		
	Brass, bronze, and copper prods.	1.4		
	Electrical machinery	1.3		
	Chemicals			

Sources: U.S. Census and Census of Manufactures, various years.
Totals rounded.

1904	Total value added by manufacturing	\$ 61 666 000	12.1 %	
	of which:			
	Foundry and machine shop products	9.5		
	Patent medicines &c.	7.2		
	Tobacco manufacturing	6.2		
	Stoves and furnaces	5.8		
	Autos, incl. bodies and parts	5.6		
	Printing and publishing			
1910	Total value added	\$ 112 774 000	22.9 %	
	of which:			
	Autos, incl. bodies and parts	8.7		
	Foundry and machine shop products	5.9		
	Patent medicines	5.6		
	Tobacco manufacturing	4.3		
	Printing and publishing	3.3		
	Brass and bronze working			

Table 18: Michigan's leading manufacturing industries 1890-1920

1920 Total value added	\$ 1 546 900 000
of which:		
Autos, incl. bodies and parts		42.7 %
Foundry and machine shop products		6.5
Shipbuilding		3.1
Engines (steam, gas, etc.)		2.9
Furniture		2.6
Lumber and timber products		2.0

1900 Total value of manufacturing	\$ 277 800 000	26.4 %
of which:		
Lumber and timber products		8.2
Flour and grist mill products		4.8
Foundry and machine shop products		4.0
Steam railroad cars		3.6
Planing mills		3.6
Furniture		

1900 Total value of manufacturing	\$ 356 900 000	15.2 %
of which:		
Lumber and timber products		6.6
Flour and grist mill products		5.8
Foundry and machine shop products		4.8
Copper smelting and refining		4.1
Furniture		3.5
Planing mill products		

1900 Total value of manufacturing	\$ 316 500 000	13.5 %
of which:		
Autos, incl. bodies and parts		10.4
Lumber and timber products		8.4
Foundry and machine shop products		5.3
Furniture		3.9
Printing and publishing		2.8
Tobacco manufacturing		

1904 Total value added in manufacturing	\$ 493 400 000	36.3 %
of which:		
Autos, incl. bodies and parts		4.8
Foundry and machine shop products		4.0
Lumber and timber products		3.6
Furniture		2.2
Malt liquors		1.8
Food preparations		

Sources: U.S. Census and Census of Manufactures, various years.
Totals rounded

remained on balance resolutely traditional. This skill-dependence in the dominant sector had two sorts of consequences. The first is that it sustained--at least for a time--craft unions and worker control of production. The second was that it, coupled with the ever-growing demand, sustained relatively high wages. Reliable statistics for that long ago are scarce, but every contemporary seems to have known that Detroit was a high-wage town.¹²⁷

By late 1913, the secular boom in autos was clearly only beginning.¹²⁸ Given the common production practices (described in the early part of Section 5 above) one is not surprised to observe unmistakable evidence of excess demand for skilled mechanics. So it was elsewhere in the booming sectors in Detroit as well. Here is the President of the Employers' Association of Detroit in his Annual Report for 1912.

¹²⁷ See Chalmers (1932), p. 100. Brissendon (1929), pp. 96-97, shows full-time earnings in the automobile industry for 1909 of \$759 versus an average of \$729 for all industries. But this can be no more than indicative at best

¹²⁸ "Mr. Knudson ... in 1913 ... was sure the [automobile industry] was a lasting business. He had himself purchased a motor car in 1911, taken it apart, fixed it up himself, and was convinced that it was here to stay as a means of transportation, because it would enable a person to travel in one-quarter the time taken by a horse-drawn vehicle, and this was a great factor in America. He had this impressed on him when the first remark that greeted him when he got off the boat ... was 'Hurry up' ... [H]e has been hearing [it] ever since." Knudson Interview, pp. 8-9.

This marvelous [recent] growth resulted in a demand for men which exceeded the available supply, and although the Association kept up by continuously advertising and [doing] field work in localities which do not offer the mechanic the opportunities he might find here, it was rather an uphill task to fill, in the plants of our members, the vacancies which were being caused by direct raiding from other shops, and by their want advertisements.¹²⁹

The Employers' Association has been founded in 1902 mainly to establish the open shop in Detroit, but a decade later the most pressing problem was more fundamental. Far from facing a cunning, tactical shortage of labor, the employers (as a group) confronted a completely unplanned one.

The Association had done what it could. Some of the problem lay close at hand.

A glance over the newspaper files ... will show a wonderful development in the liner sections. The modest little liner [became] almost obsolete, and column after column of flaring display advertisements appeared, each trying to outbid the other in its noisy call for help. Hardly had a good man been established in one shop before he was attracted by a call from another, and as soon as he had landed there new attractions were offered in some other plant.

Every Monday, following the big Sunday editions, department foremen were at their wits ends in replenishing their ranks which had been despoiled by neighboring establishments, and the material they used was but too often the ex-force from the very neighbors who had robbed them

¹²⁹ Employers Association of Detroit--hereafter EAD--Minutes, p. 314.

In [employers'] mad rush to supply the enormous demand for the product the one watchword had been "Production", and they devilled the life out of their managers, production men, superintendents, and foremen to give them greater output, never satisfied, always calling for more, more. There wasn't time for the foreman to stop and reason out the sane way to keep up his force. Every vacancy to him meant so many less pieces finished at the close of the day, and he, simply clutching at straws, followed what seemed, at first thought, the simplest plan--"Git 'em!"¹³⁰

The Association concluded an anti-poaching accord amongst its members, an agreement which was meant to cover informal contacts as well as the Association's own very active Employment Bureau and the classified advertising columns of the local newspapers.¹³¹ Another of its measures was to raise funds to run an extraordinarily extensive program of advertisements in newspapers (two hundred in number, the President reported) across the nation designed to encourage skilled mechanics and other such workers to move to Detroit. The Association even went so far as to write the authorities at Ellis Island, hoping for a favorable word. But they faced a real problem in all of this, and it was

¹³⁰ EAD Minutes, pp. 314-315.

¹³¹ On the agreement, see EAD Minutes, p. 315 and Nevins, op. cit., p. 517-518. On the Association's Employment Bureau, see, e.g., EAD Pamphlet or the Michigan Department of Labor 31st Annual Report (1914), p. 9. In 1914, the Association's Bureau was one of only two really large ones in the city. The other, run by the state, derived from legislation of 1905 and seems likely to have been a consequence of the "mild depression" of 1903-1904 -- "Public employment offices were advocated increasingly," writes Lescohier ((1935), p. 127, 129), citing explicitly a number midwestern examples. On the variety of employment bureaus in Detroit circa 1914, see Kreusi's study (conducted for the city's Board of Commerce), p. 22.

one which had its roots in expectations and norms for working men. The following passage, from an article entitled "The Labor Situation in Detroit," was written at the end of the decade. But it might easily enough have been written earlier.

[T]here is absolutely no loyalty to the establishment or organization in which these men daily labor for their living. They are continually on the alert for 'better pay,' and a difference of five cents per hour in favor of a new job will lead them to 'throw up' an old job without delay. In fact it is not at all uncommon for employees to use a 'sickness holiday' for tramping about in search of a job which for the same work offers the prospect of a slightly fatter pay envelope. Or it may be the opportunity for more overtime in the next few weeks, or less bossing, or a longer or shorter noon hour, or less standing on the feet, or cleaner work, or any one of a dozen other slight, personal reasons that prompts these truly 'independent' laborers to transfer their names to other payrolls so frequently. Constancy in employment relations is no [particular] virtue [here]¹³²

It is more difficult to tell what situation the unskilled confronted. But the Employers' Association clearly was not worried. The President reported in April, 1915

There has been all through the [previous] year ... a demand for the man with a trade. He can always be placed. It was the poor fellow without a trade that we had no place for.¹³³

They preferred, of course, as generalized an excess supply of labor as possible.

¹³² Watkins (1920), p. 851.

¹³³ EAD Minutes, p. 372.

A labor periodical referred in late 1913 to "an army of unemployed men in the city [who] stand at the factory gates every morning [and] flock to the various employment agencies."¹³⁴ The purpose of the article appears to be to deter immigration, not to raise outrage. One wire service article about the queues at Ford in January went on to comment that this "was not a new scene to the Ford officials. Each day for three months it has occurred [albeit] on a much smaller scale."¹³⁵ Indeed, one reporter present at the announcement in January remarked in his article on the queues of between 300 and 400 men visible from the office where he sat, the men waiting patiently outside the factory at 10 o'clock on a cold weekday morning, hoping for some sort of work, while Ford and Couzens spoke and the reporters scribbled within.¹³⁶ In November, the Board of Commerce had felt obliged to state publicly that unemployment wasn't a problem.¹³⁷ They estimated numbers and suggested that though these might seem large, they represented what we would now call perfectly ordinary

¹³⁴ Logan (1913), the unnumbered p. 7.

¹³⁵ The article is in a clip book in Accession 683 in the Ford Archives. The article is dated January 7, 1914, but the name of the newspaper printing it has been clipped away.

¹³⁶ "Henry Ford Gives \$10,000,000 in 1914 Profits to His Employees," Detroit Journal, January 5, p. 1.

¹³⁷ "Commerce Inquiry Gives Black Eye to Hard Times Spector," Detroit Journal, November 26, 1913, p. 1. Their data for the most part turns out to be about employers rather than potential employees. But they at least noticed the distinction. The hapless Journal reporter who wrote "Fewer Men Out of Work Now Than at Same Time in 1912," on p. 1 of the previous day's edition cited no evidence whatever relevant to his headline.

frictional unemployment and in any case nothing to be concerned about. Reading the details carefully, however, one discerns that the unemployment they found was in fact overwhelmingly amongst the unskilled i.e. those not intensively required in any of the City's prosperous sectors.'''⁸

The closest thing we possess to regular unemployment statistics are the surviving records of the Wayne County Poor Relief Commission. These are not tabulated for as short intervals as one might like, but they are of some evidentiary value and they unequivocally do not suggest excess demand. Table 19 summarizes: July 1913 through June 1914 saw a jump in assistance of about seventy percent.'''⁹ The city looked forward to another year of even greater prosperity, said Couzens, speaking as President of the Chamber of Commerce in January, 1913.'''¹⁰ But the prosperity appears to have been concentrated amongst proprietors and those with trades. There was clearly

''⁸ It is difficult not to be struck, reading old newspapers in 1986, that to the gentlemen of the Board of Commerce (and, equally, to the editors of many--though by no means all--of the city's newspapers) a skilled laborer without work was unemployed but an unskilled laborer without work was a vagrant. See the text of the articles cited in the previous footnote; or contrast the articles in, e.g., the *Detroit Morning News* for February 12, 1914 ("Police Stop Riots of Unemployed But Crowd Still Waits," on the unemployed gathering on Bagley Avenue and police behavior towards them) with the editorial on the same subject ("Our Hunger Riot") in the *Detroit Free Press* for February 14, p. 4.

''⁹ There was a real depression the following year, whence the even larger increment.

''¹⁰ "Prosperous Year Is Ahead of Detroit," *Detroit News*, January 6, 1914, p. 10.

Table 19: Poor Relief in Wayne County, Michigan 1910-1915

Period	Persons granted relief
July 1910 through June 1911	5 724
" 1911 " 1912	5 768
" 1912 " 1913	5 266
" 1913 " 1914	8 932*
" 1914 " 1915	19 085**
" 1915 " 1916	9 047

* Nearly a 50 % increase

** The recession is in full force

Source: Garrity (1940) Appendix

excess supply in early October.¹⁴¹ The daily press for the next two months suggests a darker and darker picture, even if not of the proportions New York, for example, faced.¹⁴² The main ray of hope newspaper editors saw was the auto trade and its associated suppliers.¹⁴³ They were not alone in this view.¹⁴⁴

The important fact to bear in mind about the auto industry in late 1913 and early 1914 is that its dominant labor requirement was still for skilled labor. There is essentially no secondary literature about the diffusion of the American System and assembly-line techniques in the industry. But there is considerable evidence to suggest that conveyor belts were scarce, the Highland Park plant aside, before 1915 or 1916; and truly interchangeable parts in quantity production were essentially unknown, again aside at Highland Park, until 1917 at the earliest. At the time of the five-dollar day, the production technology, skill demands, and labor process in the rest of the industry looked at best like the very earliest days in Highland

¹⁴¹ See Appendix II.

¹⁴² The New York comparison is from "325,000 Men Now Out of Work Here," *New York Times*, February 3, 1914, p. 6, on the publication of a study previously researched.

¹⁴³ "Detroit the Pacemaker, Showing Greater Gains than Any Other City," *Detroit Free Press*, January 19, 1914, p. 14, an article almost all of whose messages seem in retrospect to have been written between the lines. Compare it with "Auto Business Is Now Lively, Future Bright" just beneath it.

¹⁴⁴ See, e.g., the account in the *Detroit Journal* for December 18, 1913, of a speech by the President of the Wabash Railroad System on the topic "What We Think of Detroit and the Way She Is Standing Up In the Midst of General Business Depression".

Park. There was progressive assembly and some substantial degree of co-ordination of material flows, but it seems generally true that men drove the work rather than vice versa.¹⁴⁵

In all this industrial activity, whatever its skill requirements, Detroit was an island in Michigan. The 1910 Census shows the state to be overwhelmingly rural and agricultural,

¹⁴⁵ On conveyer belts at Ford, see the Morgana and Bornholt Interviews, pp. 5 and 3, respectively. On conveyers elsewhere, see Hounshell, op. cit., p. 375, n. 107, and especially Colvin (1915). See also Lewchuk, op. cit., p. 88. Chandler speculates in conversation that these techniques required substantial investment for a firm making an abrupt transition, and probably new physical plant as well. He thinks these would not have been available until towards the end of the decade, specifically starting with the development of the Chevrolet facility in Tarrytown, N.Y., in 1917. This is consistent with the running commentary in the annual reports of General Motors over the decade. (There is an assumption here about capital market imperfections, but it does not seem so implausible in context. See Nevins, op. cit., p. 234.)

Suppose we take the Highland Park output in 1912 as a reasonable upper bound on what well-organized progressive assembly could produce without the full American-System-and-integrated-moving-assembly-lines treatment. (It is a reasonable upper bound because though the lines were yet to come Ford was already implementing the American System on a substantial scale.) Then the view put in the text is certainly consistent with the individual firm outputs that went into Table 2 above--Buick, Cadillac, and Olds were the other firms of the day with a reputation for efficient production. It is also consistent with the history of attempts to make cheaply a cheap car. Durant kept failing at it, Nash said in retrospect, because he didn't understand what he had to do. Knudson says this too, a trifle gleefully since Durant finally hired him away from Ford to bring the required knowledge to bear. Chevrolet factory output certainly shot up only afterwards. See the Nash and Knudson Interviews, pp. 2 and 8 respectively.

I will explore these matters in greater depth in future research. (The meaning in this context of the material in Spencer (1916) is unclear and worth exploring. If matters were as he suggests at the plants in question, one wonders what became of the firms.)

aside from the timber industry and the iron mines in the far north. The only other substantial centers of population were an order of magnitude smaller than Detroit and supported no very extensive manufacturing population. The farms themselves, even in the remote regions, would have begun to be mechanized by the early twentieth century and many farm boys--Ford among them--first got the idea they might have some mechanical aptitude tinkering with that machinery. But there was not much scope for getting experience with the key metal-working machines--metal-turning lathes, milling machines, industrial grinders and drills--in the Michigan back-country. There wasn't much industry there at all.

So the winter of 1914 was not a happy time for the Michigan population. Demand for timber and minerals were slack, and employment in those sectors was feeble. Farm prices were low, spelling hard times for farmers. Rural distress was widespread and serious. There was agitation in Lansing for the state government to do something. But this came to little for another year. In the winter of 1914 the main action taken was taken by individuals. Chiefly they moved in search of jobs, though there wasn't much of anywhere for such as them to go. Detroit certainly didn't have anything for them.¹⁴⁶ But they, and many

¹⁴⁶ See, e.g., Logan (1913). See also *Congressional Record--House*, January 13, 1914, p. 1600 (volume LI pt. II, 63d Congress, 2d Session), quoting the *Daily Iron Trade* for January 9, 1914 at interesting length. The Board of Commerce study cited in footnote 137 above seems to have been prompted by widespread

others in the region, had nowhere else to go. And they were increasingly desperate.

The nation as a whole was not discernibly better off than Michigan. Unemployment in New York reached positively alarming proportions.¹⁴⁷ Unsurprisingly, demand slumped as well. Prices for many commodities, and shares, were well below their levels of 1912. Demand for autos was buoyant, if not quite so heavy as it had been and would be again. The Detroit factories seem to have been hiring throughout the fourth quarter. Across the nation's economy, however, this buoyancy was quite unusual.

On the fateful morning of January 3rd, Henry Ford had been, as described earlier, a prosperous Detroit entrepreneur and proprietor, little known outside outside the city and the world of automotive trade shows.¹⁴⁸ 'Ford' had meant a cheap, utilitarian car of growing popularity, a thing rather than a person. But the newspapers soon changed that forever. To the nation as a whole--and particularly to those trapped in rural

rumors of mounting numbers (see the lead paragraph of the cited article in the preceding day's issue) and Wobbly speakers on the subject (See the sheets on October 1913 in the file of notes on articles in Detroit newspapers of the period in the Dunn Collection, Reuther Library of Urban and Labor Affairs, Wayne State University.)

¹⁴⁷ Again, see the *New York Times* for February 3, 1914, p. 6, citing open unemployment in the city of 325,000 .

¹⁴⁸ Indeed, it was not until several days after the announcement that the *Times* got the details of his name correctly or even learned to spell Couzens's.

Michigan by low prices and a lack of local opportunities and to those recently tired, poor, and huddled on the island in New York harbor, now scrabbling a mean and unreliable living in unskilled and now uncertain industrial work throughout the east--the word came through with far greater clarity and force than Ford and Couzens seem to have meant.

The two of them had been neither modest nor remarkably detailed when making their statement to reporters. "The Ford Motor Company," they had begun, "the greatest and most successful in the world, will on January 12, inaugurate the greatest revolution in the matter of rewards for its workers ever known to the industrial world."¹⁴⁹ Oddly, it is not so clear as it first might seem what this puffing was meant to accomplish. Detroit had resident correspondents for the East Coast newspapers and for Reuters and the several national wire services. But Ford and Couzens had invited to their session only reporters from the local papers.¹⁵⁰ Later that week, Ford told a local journalist

I didn't think there would be all this furore and noise ... We only told the Detroit newspapers what we intended to do so that the boys could read it for themselves. That's what newspapers are for. But here we are, getting inquiries from all over the world and all kinds of excitement.¹⁵¹

¹⁴⁹ Again, see Appendix I for a complete text.

¹⁵⁰ See Lewis (1976), p. 70.

¹⁵¹ H.M. Nimmo, "Talking It Over with Henry Ford," *Detroit Saturday Night*, January 10, 1914, p. 9.

This is not the only evidence that they thought themselves to be addressing only a very restricted audience. Footnote 186 below details the company's almost total lack of forethought about, let alone preparations for, the response to the announcement by working men not already employed by Ford.

Couzens went on to describe the scheme as "profit-sharing," and Ford spoke of employees earning enough to live a self-respecting life. An ex-farm boy himself if now an extremely wealthy one, he proposed "cutting melons" worth \$10 million with his workers in the coming year. Frank Marquart, later in life a UAW activist, describes the impression all this made in a household outside of Pittsburgh.

Then came that memorable day in January 1914 when my father came home from work excitedly waving the Pittsburgh Press and shouting at us: "Look, in Detroit Henry Ford is paying five dollars a day to all his workers. I'm going to quit my job tomorrow and Frank and me will go to Detroit. We'll both get jobs at Ford's--why we'll be making ten dollars a day, think of it, ten dollars a day!" Then he read aloud excerpts from the front-page story about the Flivver King philanthropist, who was revolutionizing wage scales in America. The more my father talked the more enthusiastic he became.

My mother, however, did not share the enthusiasm. "But how do you know you'll get work in Detroit?" she ventured. I don't recall all that was said, but I do remember that her misgivings threw my old man into a rage. He accused her of not cooperating, of not lending moral support; he said she wanted to hold him back. "How the hell can we ever get ahead if you always pull back like that," he demanded, half in

German and half in English. While he berated my mother, I picked up the Press and read the story for myself. I immediately sided with my father. With the thought of getting away from the hell-hole that was Braddock, of escaping the abuse of my father because I could not find work, of going to a big city--especially a city like Detroit where automobiles were made--I was all for pulling up stakes and heading for the Motor City as soon as possible.¹⁵²

But neither Marquart was a skilled laborer in the sense the rest of the industry or the rest of buoyant Detroit required.¹⁵³

Clearly neither then had the first idea about auto production methods, let alone that Ford's production process was any different from the others. It was just 'Detroit where automobiles were made'.¹⁵⁴

It is easy to ascertain that newspapers and periodicals all over the country, and indeed the world, presented the five-dollar day in such a epochal light. Opinions differed as to what the move portended, of course--the Times and the Wall Street Journal saw a quicker end to Ford's personal fortune than they did to the labor agitation and threats to the institutions of private property and competitive capitalism.¹⁵⁵ But it seems that no one

¹⁵² Marquart (1975), p. 6.

¹⁵³ Ibid., pp. 4-5.

¹⁵⁴ Neither of them got the time of day from Ford, though they did encounter the wrong end of the famous firehoses. (Ibid., pp. 7-9.) Marquart pere found, after a time, a job in a factory. Frank had much harder luck, though eventually he too found a berth. They never went back to Braddock.

¹⁵⁵ The Journal was especially acid. "Such rewards ... mean material, financial, and factory disorganization. ... Ford ... has in his endeavor committed economic blunders, if not crimes. They may return to plague him and the industry he represents, as

who could read was in ignorance.'¹⁵⁶ It is time-consuming but not difficult to simply read the reports that week in all the widely read newspapers of the day; one can easily enough learn from the microfilms at least what the people who read the news knew. It is much more difficult to know in any scientific or even statistically reliable way what they thought of it and what they made of it in the light of their personal circumstances. But we do know that for many of them those circumstances were not good, and there is evidence--to be considered in Section 8 below--to suggest that considerable numbers felt and acted as the Marquarts did, making the trek to Detroit and out to Dearborn.

So the status quo ante was indeed more complex than a conventional narrative like that of Section 3 suggests. There is strong even if circumstantial evidence to suggest the local labor market as a whole was already not in equilibrium, whether or not the Lee Reforms had solved the problem of Ford workers--who were

well as organized society." "An Experiment with Consequences," *Wall Street Journal*, January 7, 1914, p. 1. The editorial posture never really changed in the succeeding days of comment. But by January 9, the reporters had begun to calculate the advantages of an additional shift for Ford's machines. See "Ford's Three Shifts a Day A Revolution in Industry," *Wall Street Journal*, January 9, 1914, p. 3.

¹⁵⁶ Ford was in New York later that week for an auto show and went to the Hotel Belmont barber shop for a haircut. The barber chattered endlessly about it. But he was skeptical that this man Ford could really mean what he was thought to have said. "I work in Detroit too, right in the Ford works," Ford reported saying, "and I know Ford well enough to know that he will put the plan through." What the barber did, if he believed his customer, is not recorded. See, e.g., "Barber Tells Ford Scheme Sounds Fishy," *Detroit Free Press*, January 9, 1914, p. 3.

well-informed about working conditions--leaving work for less pressured and paced jobs elsewhere in autos or the metal-working trades. The compensating differentials story makes sense if the Ford Motor Company had to attract its new hires from within the industry. But they didn't. This history, coupled with that of the technical change offered earlier, suggests that the labor supply curve the company faced (measuring work in terms of time rather than effort units) was shifting down, not up. The missing details of Section 5 may thus not be alone sufficient to interpret the new labor market equilibrium.

This raises (or perhaps raises again with a bit more bite) three questions. What are the details of the time path of the wage-time and wage-effort bargains? (And what can be said about their correlations with turnover?) How did workers elsewhere in the industry in fact respond to the Ford announcement? Precisely who really was on those famous queues? With some idea about these in hand, one would be in a position to make a positive case for an alternative. I will therefore first lay out what I have been able to discover about them and then make my case for a different sort of market equilibrium.

8. Inside and outside the factory together

How was work at Ford changing from the worker's point of view? It is difficult to assess this in any direct way, since effort is not directly observable. If circumstances were such that the technology was being held constant, the pace of output from this essentially fixed-coefficients production process might be a reasonable proxy. But while that might conceivably be a reasonable approximation after the announcement, it clearly is not for the whole of the period before at Highland Park.

The context is this. Assembly lines were installed in component operations (motors, magnetos, transmissions, fenders) starting in April, 1913. The head of production wrote

By August, 1913, all links in the chain of [continuously] moving assembly lines were complete except the last and most [central] one ... Before the end of the year a power-driven [final] assembly line was in operation, and New Year's saw three more installed.¹⁵⁷

"Ford mass production," he concludes, "and a new era in industrial history had begun."

¹⁵⁷ Sorenson, op. cit., p. 131.

In the light of this, Chart 2 (which is the data of Chart 1 plotted over a different x-axis) is quite striking. Its message is that productivity--whatever the source, be it labor-saving investment, improved co-ordination, or increased effort and pace--had been rising steadily but quite slowly to the late autumn of 1913. Then it jumped--the familiar annual pattern preserved, but at a much higher level. Certainly capital-per-head increased--see Table 20--but this is also the period of the swiftest labor turnover, and it is not so clear what was happening to capital per effort unit of labor.¹⁵⁸ One certainly wonders how much of the increment to physical productivity growth came of increased pace and effort lavished on a given stock of physical capital and labor hours. From that perspective, the five-dollar wage would look like a response, coming after the main action, rather than a prompt, preceding it.

Throughput rates certainly say nothing about the disutility of effort. In the absence of any more direct evidence about effort and wages, can we say how the five-dollar offer affected the labor supply facing Ford? It is certainly a plausible story about this history that workers thought the Lee Reforms would mean an important change in the terms of work and so turned over much less that month.¹⁵⁹ Thereafter, they saw that the whole

¹⁵⁸ This investment was largely in dedicated machine tools rather than in the assembly line technology per se. See Table 9 above.
¹⁵⁹ Perhaps they were also simply short of cash. October had been a short work month for Ford employees: the factory had been shut down for half a week for 'inventory-taking'. The staff had

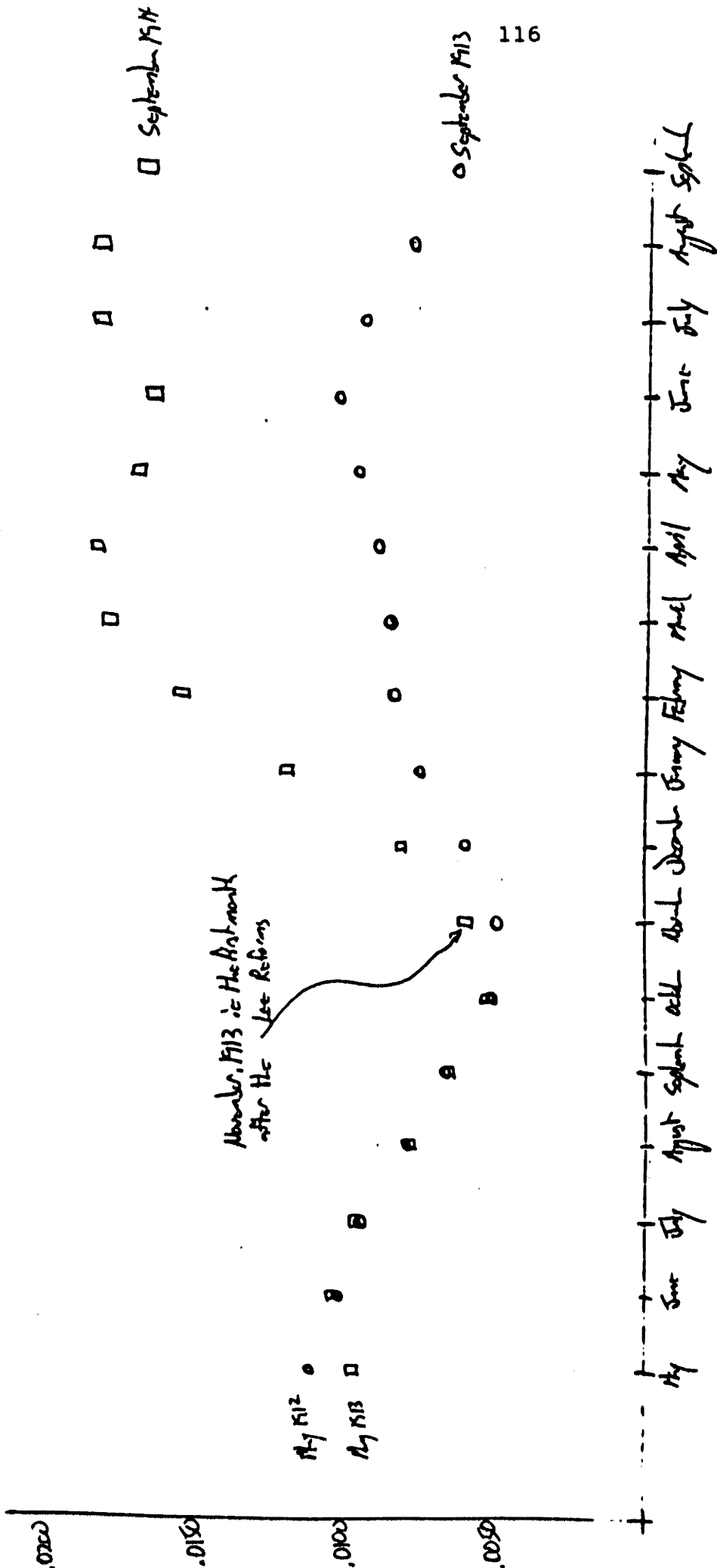


Chart II: Three-month moving averages of throughput rates May 1912-September 1914

Source: See the notes to Table 9.

Table 20: Ford investment in fixed productive capital 1912-1915

	1912	1913	1914	1915
Factory equipment	371 111	676 589	1 661 155	2 606 356
Power plant and machinery	1 843 967	2 832 907	3 821 465	5 693 648
Tools	566 510	824 901	1 199 799	1 491 843
Patterns	66 884	92 710	105 992	142 998

Total productive capital	2 848 472	4 427 107	6 788 391	9 934 845
Average annual employment	6 867	14 366	12 880	18 892
Capital-per-head	414	308	527	525

Sources: Ford Motor Company Annual Reports, various years, and Nevins (1954), p. 648 (quoting from papers in evidence for the Additional Tax Case).

organization was more and more being driven with the old relentlessness and worse. So turnover swiftly began to rise again in November and December, soon attaining the old high levels. Is there any evidence the workers took this view of the terms on offer? Perhaps surprisingly, there are two distinctly promising lines of attack. One concerns potential applicants, the other actual ones.

Out-of-town papers were, as suggested above, very worried about how a five-dollar standard would affect the demands of labor. After all, as one editorial writer puts the point directly, "The common laborer's efforts ... are not worth five dollars a day."¹⁴⁰ The theme he was developing was that other proprietors face a simple choice: pay Ford wages (and be ruined) or see your employees either defect or agitate. Curiously, this attitude does not seem to have been common amongst Ford's competitors. The *Detroit News*, on the day they reported the announcement, asked some Detroit auto men what they thought the announcement would mean for them. Their comments, quoted in part

been sent away, as would then have been conventional, with no formal assurances that they as individuals would be rehired. Each would have been part of a great mass dumped all at once onto the local labor market. For an account of the fierceness with which these people struggled to reassure themselves of their old jobs once the plant re-opened, see Appendix II below. These were not people with collateral such that they could borrow against future income streams.

¹⁴⁰ Waterloo, Iowa Times Tribune, January 8, 1914, in the Ford

above, were sanguine.¹⁶¹ This industry is a small world, such men were saying. Production techniques differ but the workers talk to one another and no one is in any ignorance of what the practical alternative employments are. Ford--whatever he says-- isn't giving money away: net profits will in fact rise. Workers will take home more cash per hour, but they will work proportionately harder for it.

If this was in fact how things were (and not some species of bravado), one would expect to see little intra-industry migration or shopfloor agitation in factories other than Ford. At the old wage levels everywhere else in the industry, the other employers would not be losing workers to Ford or having labor troubles. These are falsifiable claims. What actually was happening?

On intra-industry migration, one might have thought that short of getting access to forms from the Ford employment office honestly detailing the work history of applicants, there would be no hope of answering this.¹⁶² No information from that source is yet at hand.¹⁶³ But it is not in fact true that one could expect no other sources of inferences. There are three.

¹⁶¹ "Other Auto Men ..." *Detroit News*, January 6, 1914, p. 2.

¹⁶² The Employment Office may have asked all the people who got as far as Employment Office interviews. (Arnold and Faurote, op. cit., p. 57.) What was found out from this that was also true I cannot say.

¹⁶³ But there is hope, since I have recently discovered that a considerable number of the files survive. They exist as Ford

The first involves the Employers' Association. Its original purpose, after all, was to provide a vehicle for Detroit proprietors to meet and discuss matters of mutual interest, particularly concerning labor supply. We have seen that presentations at its annual meetings were blunt enough in tone to have confronted directly the problem of labor plundering two years previously. The 1914 annual meeting, like all the others, was held early in the year, when the events at Ford would have been fresh in memory whether or not still a concern of the production supervisor. So if there was large-scale intra-industry migration, it's at least plausible that the EAD would have discussed it. Did they?

The second involves the trade press. There was quite an active trade press at this time. It was sustained by advertising, of course, but its leading journals carried many substantial articles each issue. The articles concerned both new models and the affairs of the companies which made them. These journals gave very prominent coverage to the announcement, both as news and in editorial comment. Was there subsequent discussion, or reporting, on how the scheme was affecting

Industrial Archive Accession AR-84-57027 and I hope to get a look at them soon. An American Studies dissertation currently being written at George Washington University by Kathleen Anderson Steeves may reveal something of their contents.

competitors? For that matter, is there any relevant information in the staff Reminiscences in the Ford Archives?

The third involves direct evidence. The Reminiscences are not a good source for the impressions of the blue-collar workers of the day. But some might have left autobiographical traces elsewhere.

I have examined a substantial portion of the EAD historic records, probably a substantial majority of the surviving records of the period. A complete set of annual meeting minutes survive. These are so detailed as to constitute, for all practical purposes, transcripts. It is clear from the list of those attending that the meeting tended to be operations managers rather than chief executives or owners.¹⁶⁴ The striking feature of what was said at the 1914 meeting from this perspective is that Ford wages, and for that matter wage levels anywhere, did not arise as a subject of discussion. So there are two possibilities. Perhaps the dog was indeed not barking. Perhaps they had more important things to discuss, or discussions were held in a more intimate way. Whichever, these minutes offer no positive evidence that the raise to a five-dollar day threw the

¹⁶⁴ Ford, for example, had three representatives. Sorenson and Martin, the head of production and the plant superintendent respectively, were among them. Couzens, the chief operating officer, was not. This pattern was consistently maintained across companies and time.

local labor market into disequilibrium.

A footnote in Nevins suggests the existence of an Automobiles and Accessories committee of the Association. Foraging in the EAD Archives turned up minutes from meetings in 1910 and 1911. They are written in the same comprehensive style, and Martin and Sorenson are consistently the (sole) Ford representatives. The main topic then was (how to cause) the decline of craft control through company-controlled training schemes. If this committee was still meeting in the winter of 1914, it must have discussed these matters. But I have not been able to find any minutes of any later years.

The trade press, on the other hand, furnishes just the contrast to this one might have hoped for. Exactly the right question is framed; those in the position to know best are asked; the answer is printed directly. There is little for me to do but identify *Automobile Topics* as a serious contender for being the leading auto industry journal of the day, give the context, and quote.¹⁶⁵ Their first article on the scheme expressed the usual worries about labor unrest. A week later, they wrote thus.

¹⁶⁵ I base this assessment of the journal's status partly on a comparative inspection and partly on the opinion of the Automotive History Collection librarian at the Detroit Public Library.

Harmful effects that were feared in a disturbance of the labor market have not been felt by other automobile manufacturers to any serious degree [and] no difficulty is expected ... [E]mployees ... rapidly reached the view that the Ford Company's action cannot be followed by companies that are not in the Ford Company's position in respect to methods ...

For the Ford Company, the move is regarded as shrewd [as well as] businesslike, since it permits continuous 24-hours-a-day working of the plant with no labor difficulty.^{166 167}

So all was quiet on the shopfloor elsewhere--no mass desertions, no rumblings, just a quiet taking stock. The Mid-West correspondent for the authoritative Iron Age, O.J. Abell, found roughly the same thing when he went to Detroit.

Investigation in Detroit [indicates] that among the men having ... employment in other lines, the [compensation change] at the Ford plant is received in an impersonal way and is classed as a unique situation comparable with the many other unique events in the history of the Ford Motor Company.¹⁶⁸

The 'unique events' readers of Iron Age, a technical engineering journal, would have thought of are the changes in production technology and their implications for work control.¹⁶⁹

¹⁶⁶ "Ford Bonus Plan Further Extended," Automobile Topics, January 17, 1914, p. 793.

¹⁶⁷ Ford himself spoke plainly to newspapers. "If other manufacturers find that a problem has arisen, they can solve it by treating those who work for them in the same way [through a readjustment in manufacturing methods ...]" See "Gold Rush On at Ford Plant: Mob for Jobs," Detroit Free Press, January 7, 1914, p. 6. See also Abell (1914b), p. 308.

¹⁶⁸ Abell (1914b), p. 308.

¹⁶⁹ Again, see Abell (1912).

There is, it turns out, evidence that events took this sort of look from the Ford shopfloor too. Klann, for example, close to the events and decisions, daily and hourly walking around the lines, his memories preserved in the Ford Archives, is perfectly blunt:

The fellows got this extra money but they got no raise whatsoever because they had to do twice as much work.¹⁷⁰

For what it is worth, the company publicly acknowledged as much. During Abell's trip, he spent two days 'with the Ford principals'.¹⁷¹ He then wrote the following in his initial article on the scheme.

As for [the complaints that] the minimum of \$5 [is] too large an amount for the labor performed, as compared with the scales established by the prevailing competitive market, it is the belief of the Ford Motor Company that the production to which an employee contributes in its plant under the system in force is correspondingly as much in excess of the production per man elsewhere as the Ford daily minimum is in excess of the corresponding wage elsewhere.¹⁷²

¹⁷⁰ Klann. p. 107.

¹⁷¹ The phrase in quotation marks is from "Ford Drops a Meaningful Hint to Some of His Critics," *Motor World*, February, 1914, p. 5, an article quoting and commenting on Abell's piece.

¹⁷² Abell, loc. cit.

Finally, it turns out that there was one eye-witness who recorded his impressions.¹⁷³ It is worth quoting at length from a published fragment.¹⁷⁴

[M]y savings were very low, and the need for additional income gradually turned my attention to Ford's ... Reading about the brutal handling of [the January] applicants and knowing of the slave-driving methods of the factory, I for a time fought back the temptation to work there. I liked the atmosphere at Dodge [where the foreman 'expected men to work steadily and well, but snapped no whip of [paced] exertion'], even though it meant two hours more of work at almost half the pay. But the urge to earn more money was soon strong enough for me to yield to the temptation ...

One cold Monday morning I took the streetcar to Highland Park and hurried to the employment office ... When my turn came ... the interviewer ... hired me. Pleased with my success, I went to see the foreman at Dodge Brothers, and explained to him my need of additional income and told him of my gratitude for his friendly behavior toward me. He shook his head in regret, told me I'd be sorry, and generously stated that when I was ready to return he'd see what he could do for me.

One gets the impression the foreman had had this conversation before.

¹⁷³ The man, Charles Madison, started his working life poor and blue collar in Detroit. He spent his adolescence and early twenties working in the auto industry. He then put himself through high school and the University of Michigan. Thereafter he seems to have had nothing to do with industry per se: he seems to have made his career writing and working for a publisher in New York. He does not seem to have had any direct involvement left-wing politics or even the UAW, the radical sounding title under which the fragment from which the following extract is drawn notwithstanding. (He did write a book about notable figures in the history of the American labor movement. But it constitutes a single entry in a notably wide-ranging bibliography.)

¹⁷⁴ Madison, op. cit., from pp. 452-454.

I found the Ford plant greatly reorganized, and I was assigned to a lathe in a new section. The harried foreman told me that my operation had been timed by an efficiency expert to produce a certain number of finished parts per day. I timed myself to see what I could actually do, and realized that I might achieve the quota only if all went well and I worked without letup the entire eight hours. No allowance was made for lunch, toilet time, or tool sharpening. I refused to disallow necessary delays, although I managed to keep the machine going while munching my sandwich. When I failed to produce the assigned quota of finished parts, the foreman scolded me. The next day another efficiency timekeeper with a stopwatch was assigned to observe my work. After an hour of making notes as I worked he told the foreman I was too slow in placing the part in the machine and was making no effort to speed up. I defended myself as best I could, asserting that it was humanly impossible to keep up the expected pace. I was annoyed enough to accept dismissal without regret, but no action was taken against me. I continued to work at a fast pace, but made no real effort to product the assigned quota.

I later concluded that the speedup policy was intended to get the maximum production out of the workers by requiring them to produce their operations at a high rate of speed without ever actually meeting the demanded quota. Much as I resented a policy I considered inhumane, I tried to resign myself to it in the hope of earning five dollars a day. I was therefore shocked and angered when my first pay envelope revealed that I was being paid twenty-five cents an hour or two dollars a day. When I questioned the foreman about this, he told me blandly that the arrangement was to begin paying five dollars a day only after the worker had been with the firm six months and had proved his ability to maintain his quota arrangement. The unethical nature of this policy outraged me, and I told him I was quitting at once. Much as I wanted to earn the higher wage I refused to yield to the company's duplicity

Felling sheepish . . . I returned to the Dodge factory, admitted to the foreman that I had been a fool for leaving him, that the Ford lure was a mean deception, and that I would be grateful to get my job back He agreed to take me back

The force of all this evidence--perfectly consistent with the first interpretation I offered of the EAD Annual Meeting silence and with the readings I proposed of the Detroit News quotes from Vollbrecht--seems plain. The employees of the other auto plants were not seriously tempted. The Lee Reforms might or might not have established an equilibrium with the industry at the time, or at least enough of a wait-and-see attitude to account for the drop of turnover in October and its subsequent swift rise. The five-dollar day certainly involved a much bigger raise. But circumstances and prospects had changed significantly by then. By this time most of the innovation was clearly flow-speeding rather than effort-reducing. Production at Ford was essentially fixed coefficients; and in December one did roughly twice as much there in an hour as in the December of the previous year.¹⁷⁵ Disutility certainly increased some. The five-dollar day may have sorted things out. But to a significant extent it did so in a compensatory fashion.

If this interpretation is to be persuasive, something must be said about the queues. They certainly look like evidence of excess supply due to the quoted wage. My considered opinion is that they represent a disequilibrium phenomenon which is not to be attributed simply to the Ford wages. That is, I believe surplus was being offered, but not of the great magnitude the

¹⁷⁵ The same holds for October-September averages.

length of the queues suggested to many. I think a substantial portion of the queues were merely attracted by, not caused by, the wages on offer.

I have several sorts of evidence to offer on behalf of this view. The first is reporting in newspapers. The following was printed on January 7th.

Long lines of unemployed men stretched out from the plant of the Ford Motor Company early today, and twenty-five policemen, under the command of Captain John Worden, guarded the approach to the employment bureau of the corporation to prevent a repetition of the scenes which were enacted yesterday when 10,000 jobless men seeking employment at a "minimum wage of \$5 a day" stormed the plant and were driven away only by the use of clubs and the display of lines of fire hose.¹⁷⁶

The significant feature of this passage is that those waiting are identified as jobless. Again,

Thousands of unemployed persons from cities throughout the Middle West began arriving in Detroit today, drawn here by the announcement of the \$10,000,000 profit-sharing plan of the Ford Motor Company. They are anxious even to wield a broom in the Ford plant at a minimum salary of \$5 a day.

¹⁷⁶ This and the following passage are taken from a clip file in Accession 683 of the Ford Archives. The clipping was done in a way which often obscures the sources. Both articles are datelined Detroit, January 7, 1914. I suspect that the first ("Camp Out All Night to Get Jobs with Ford") is from a local paper and that the second ("\$5-a-day Jobs") is a wire service story. But I do not recognize the typeface of either.

I could easily multiply these examples many times over.

The local unemployed weren't withholding themselves from the firms paying competitive wages in the local labor market. Given the skills they could offer, they could not, as I have discussed above, find jobs at all. They had been trying at Ford for good some time.¹⁷⁷ To the extent that the out-of-town workmen--unemployed or otherwise--knew anything about what was going on at Ford, they would have known what the factory made and what it paid. But there is no reason to think they would have arrived anything but ignorant of the terms of work.

This view seems only the more plausible when ones notices that there is no reason to believe the people on the queues were skilled workmen i.e. with knowledge of, and in all probability contacts in, the industry.¹⁷⁸ I have already noted that contemporaries did not think Ford was paying a significant premium over the market for skilled men.¹⁷⁹ The EAD said

¹⁷⁷ See the texts cited in footnotes 134-136 above.

¹⁷⁸ Speek, op. cit., p. 2, reports that close observation of those in the queue ("mingling and talking with them") confirms this. "My [eventual] impression was that the vast majority of them were casual laborers."

¹⁷⁹ The plain vanilla microeconomist wonders why and turns to Klann. A passage quoted above (from Klann, p. 85) runs on thus:
 On the assembly lines we just simply turned up the speed of the lines. [But] they used to get [only] the same amount of work in the Machine Shop because they couldn't make the machines [let alone the highly skilled machinists] go any faster, and on the assembly lines we could. There was some

throughout they had no trouble placing the skilled man. So there was no point in a skilled man queueing, with all the discomfort and visibly likely frustration that entailed. (Indeed, in February, EAD Secretary Whirl was still busy writing off recruiting letters, painting in each a bright picture of employment prospects for a shop-handy man in Detroit. But the need was for "real mechanics," he told the Morning News. He "would not be justified in urging men of less skill to come."¹⁸⁰ There was plenty and more of unskilled labor to be had locally at the going wage-effort rate.)

Third, there is every reason to believe the city was in fact being inundated by unskilled workers. A letter in the minutes of the City Council speaks eloquently to this.¹⁸¹

To the Honorable the Common Council

Gentlemen:

A large number of men without means have been applying to us nightly for lodging, also for something to eat, and as far as possible we have been providing both in a very meager way.

... driving to do in those days. Some fellows just wouldn't take [it], and they would quit the job and turn over instead.

¹⁸⁰ "Laughs at Plan to Unionize Auto Industry Here," Detroit Morning News, February 6, 1914, p. 7.

¹⁸¹ See City of Detroit, Journal of the Common Council, January 20, 1914, p. 41.

These demands upon us have recently increased to such a number that it is impossible for us to take care of these people.

Each night the entire cell blocks, including the corridors, are crowded far beyond anything that conforms with rules relating to reasonable sanitation.

The imperative need for a temporary lodging is so great that I respectfully request that your Honorable Body refer this matter to a regular or special committee for immediate attention.

The applicants for assistance are all strangers within our city and ... some provision must be made to protect the public from a possible menace owing to the large number of unemployed strangers among us.

Yours very respectfully,

John Gillespie
Chief of Police

It is an interesting fact that this letter was assigned to the Committee on Public Buildings for action and that the Committee offered no report over the next several months. When the worries about joblessness and homelessness in the depression of the following winter were discussed by a consultant to the Detroit Board of Commerce, he spoke of the problem as if it had begun in the late autumn of 1914.¹⁰² A reasonable inference would be that these immigrants either went away or got jobs outside of the auto industry fairly promptly. There is little discussion in any source I have encountered of the sort of fall in wages outside autos their getting jobs would have required--if

¹⁰² See Kreusi (1915), e.g., p. 1.

people were coming from centers as large and far away as Pittsburgh, as the Marquarts did, it seems likely the Board of Commerce's 25,000 unemployed had their numbers sharply increased. So I infer these immigrants came and went. It would certainly be behavior compatible with Ford paying a compensating differential and people from outside of Detroit knowing only the gross pay, not the details of the wage-effort bargain.

In short, those in the queues seemed to reporters to be predominantly the structurally unemployed or from out of town or both; they were almost undoubtedly the sort of workers who would be likely to be structurally unemployed; and there were certainly plenty of such unemployed people then arriving in Detroit. I note, to close this discussion out, that the Detroit Journal for February 3, 1914, reports that 500 men were showing up daily at Ford looking for work; they were examined, says the article, and hired if found deserving. Recall the scene, and the numbers, outside Ford's office as the announcement was first made just a month before. It sounds as though things had gotten back to normal.

But this is something of a digression. The gross picture I propose is as follows. Ford had been changing the character of auto work in the course of increasing productivity and output. He had also been losing workers in vast numbers to other jobs in the auto industry and metal trades as well, presumably, as elsewhere. He found the turnover disturbing, for reasons which

are not yet clear; and he wanted to do something about it, not least because there was good reason to think the causal conditions were about to get worse.

What he did was to make staying attractive by offering an element of compensating differential in the handsome new wage. Due to the turnover, workers in the industry knew the work- (effort-)conditions at Ford. The new wage offered was not in excess of a compensating differential to them; they were not tempted to down tools and move in any serious numbers or to harass their employers over higher pay. But they were not the only potential employees, and queues did form. Those standing waiting were for the most part of two types. Some were local (and perhaps well-informed about the relative merits of work at Ford as against other automobile plants) but not employed at all. We know they weren't skilled because the wages on offer weren't particularly attractive to skilled laborers, for whom there was in any case excess demand at the time.¹⁸³ So they were unskilled. Being unskilled, they had little hope of employment elsewhere in the industry, given contemporary techniques

¹⁸³ Slichter's turnover figures do indicate some considerable slack in Detroit labor markets over the course of 1914. (See Slichter (1921), p. 32.) If this touched skilled auto makers, I suspect it came later in the year, as even Detroit lurched into Depression. Compare the articles cited in footnote 137 above with the consultant Kreusi's (1915) report about the city's efforts to cope with large-scale unemployment a year later. The numbers in Table 19 are suggestive.

everywhere but Ford, under any circumstances.¹⁸⁴ Outside the industry and its suppliers and job shops, there weren't jobs, period. So there was in fact great surplus on offer at Ford, and of course those on the queues were keen for the jobs and would queue tenaciously even in extreme conditions. The others were from out of town (and so in all probability were badly informed). They were driven by mean circumstances or by actual unemployment and they too certainly saw surplus. Badly informed or no, they were close substitutes for most of the people Ford employed. And there were more where they came from. There was genuine excess supply of labor.

Still, it is striking that they were not part of the group Ford thought he was addressing.¹⁸⁵ ¹⁸⁶ For Ford did not hire his

¹⁸⁴ That they could, in fact, work at Ford puts a funny twist on Braverman (1974): de-skilling improved their welfare.

¹⁸⁵ One reader has commented that this sounded like an awfully schematized vision of the local economy. Weren't there lots of local shop assistants standing on line, eyes wide with the sudden prospects? I can only reply that the two articles quoted above are typical of the news reports of the queues. The contrast to what one reads, e.g., of a gold rush-- where there are shop assistants and those less likely still aplenty--is noteworthy. Clark (1978) on the Australian gold strikes of 1851 is a good reference here, as he relies heavily on contemporary news accounts. (He also writes very beautifully.)

¹⁸⁶ There is clear evidence that Ford and his managers were surprised, not to say shocked, at the great queues of potential employees seeking work--that is, by excess supply of labor at the wage they were offering. They do not seem to have made any provision whatever for coping with the bodies. For example, there was no suggestion in the announcement that there would be no immediate hiring--indeed, one could easily read in their text a suggestion to the contrary. In neither the announcement nor anywhere else did the Company suggest that job-seekers ought to come anywhere other than the employment office inside the factory grounds. Naturally, job-seekers turned up, regularly, by eight

extra 5000 workers from the queue, or from anywhere else, for quite some time. In the course of the year 1914, average employment at the Ford Motor Company actually fell slightly. (See Table 21.) A notable productivity increase did occur at Highland Park, but for all practical purposes it came before the wage rise. Productivity was essentially flat (subject to the usual sort of seasonal variation), just much higher, from around November onwards. The new wage was consequence, not cause.

in the morning at the factory gates. The numbers were such the first week that the already employed work-force--apparently not excluding Ford himself, coming in on foot and unnoticed--had the greatest of difficulties even getting onto the premises. See, e.g., the photograph running across the top of p. 1 of the *Detroit News* for January 6, 1914.

One further quaint note is this. The announcement spoke of the profit-sharers i.e. the beneficiaries of the new scheme as 'men'. What about female employees, asked a reporter of Ford at the New York Auto Show later that week. The question clearly hadn't occurred to him. See Nevins, op. cit., p. 534, citing the *New York American* for January 10, 1914.

Speak, who spoke with the company Secretary Liebold on January 14, was told then that there was no printed copy of the profit-sharing plan's details to give him. "[It] had not been put on paper as yet, it was only a mental plan I asked him regarding the men outside the plant, who they were, where they came from, and he replied "God only knows!" See Speak, op. cit., p. 9.

Table 21: Ford Motor Company average annual employment
1908-1915

Year	Employment
1908	450
1909	1 655
1910	2 773
1911	3 976
1912	6 867
1913	14 366
1914	12 880
1915	18 892

Source: Nevins (1954), p. 648 (quoting figures from papers in evidence for the Additional Tax Case).

9. Inside the workers

I interpret all this evidence in the following way.

There is something in the history to explain. Wage differentials which were not serving to clear markets do seem to have been present. None of the three established efficiency wage theories, at least interpreted in the terms (of isolated actors) in which each is conventionally put, seems adequate to explain the wage rise. Yet Ford quite explicitly averred he was not giving something for nothing. So entrepreneurial rationality, at least in intent, is not in doubt: the owner recognizes the issue and claims, in effect, to have been maximizing profits through the acts in question. But the theories don't explain why his measures would accomplish this.

It does seem clear that starting around October 1913, work in the Ford factory became significantly more taxing. Turnover dropped dramatically when the power of the foremen was broken that month. I have discussed the petty tyrannies above; presumably the work force thought all would be improved. Yet the assembly line organization was started in a serious way just then, and Chart II shows that starting roughly then the whole plant began to be driven to this swifter and more insistent pace. So perhaps Lee was naive in thinking his bureaucratizing reforms

and a 15 percent pay rise would set the turnover rates right: turnover seems to have swelled swiftly starting in November, after withering to nothing--at least, to an annualized rate hundreds of percentage points below the industry average--in October. It seems reasonable to attribute this to the other contemporary change in life in the factory, the new pace coupled to the new form of workplace control.

Still, it is noteworthy that nowhere in these early archival records, even in the midst of discussions of the enormous turnover rates of late 1913, does one see any references whatever to vacancies or recruitment problems at Ford. The Ford Motor Company was not worried about men leaving since training costs were low. But neither was it worried about getting the right man in the door: they (and, for a time, they alone) had altered their production process in such a way that nearly any man would do. The relevant labor pool had grown much larger. The poaching troubles which so worried Mr. Whirl were not then troubles of theirs.

Ford had, on the other hand, acquired a genuine new problem along with the new, integrated, and so much more interdependent, production process. The company needed to get men; it didn't need to worry much about keeping them; but it needed to worry quite a lot about keeping them happy while they were there.¹⁸⁷

¹⁸⁷ Thus perhaps Porter is to be taken at face value after all

Those who did not want to cooperate might not simply leave, and the cost of strategic interruptions to the production process were growing rapidly.

The Ford Motor Company was well along in the process of investing in specialized fixed assets. Much of this was tangible. There was the purpose-built factory. There were the custom-designed machine tools dedicated to the Model T. And much, in some respects the most innovative part, was intangible. There was the organization capital involved in a smoothly running company employing roughly 15,000 people and agents, each with the detailed knowledge of their part in the grand division of labor. Here again, the aggregand was a more precious thing than the parts. Similarly, and most to the point, there was a managerial staff which could make it run, the first such staff in American industry. These assets--loosely dedication and very strict coordination--were themselves the source of the enormous quasi-rents.¹⁸⁸ There could be no continuing to receive the rents while substituting out of the assets. More investment seemed to

 when he writes (1917b), p. 265, that the decrease in turnover costs yielded savings but the "saving through the ... effect of a ... contented workforce" was more important.

¹⁸⁸ "This scheduling of machine output tends to produce maximum results from machines." (Colvin (1913), p. 761.) "It is considered preferable [at Ford] ... to accept [an a confident middling expectation concerning the rate of production] and to bring the human element in step ... and to pay a straight [i.e. time] wage for that labor rather than to accept the variable output per man under piece rate or premium inducement." (Abell (1912), p. 1439.)

yield more profits. More investment was certainly going on. Net income certainly was rising.¹⁸⁸ But these quasi-rents could be appropriated by a sufficiently well-organized pool of workers.¹⁸⁹ There was, in principle, something to fear.

The picture all this suggests to me then, is rather of some compensating differential being offered to Ford's (new) labor pool, whose opportunity wage was much lower than those of the indifferent skilled mechanics elsewhere in Detroit, and some further surplus being offered them as well. My hypothesis is that Ford was trying to buy an amicable acquiescence to the changes it was effecting--changes which employees would know it was effecting--in work content (effort demands) and in work experience.¹⁹¹ Both these latter changes were clearly of some importance to workers.^{192 193}

¹⁸⁸ For a glimmer of the investment situation, see Table 20. On net income, see Table 12. In interpreting the latter, bear in mind that over this period the price of the products stayed constant or actually fell. See Table 11.

¹⁸⁹ For all Ford's analogies to partnership distributions, he seems to have been quite clear in his own mind that the industrial relations regime he wanted was an autocracy. See Flink (1975), p. 80.

¹⁹¹ That is, he was buying the peace. See the remark footnoted 205 below. For an analytic treatment of the strike threat, see Dickens, op. cit.

¹⁹² For a doubtless predictable example, see *Industrial Union News*, February, 1914, p. 1. But even Ford himself felt compelled to comment. His expressed view was tart but accommodating: "The average worker, I am sorry to say, wants a job ... in which he does not have to think." Ford (1922), p. 103.

¹⁹³ It is perfectly intelligible to neoclassical theory that both these should matter--indeed, that cases in which either does not must be the exception and not the rule. I sketch the argument in the second appendix below (which derives from Raff (1985), (1986b), and (1987a)).

It would lend credibility to a buying-the-peace explanation to show the company consciously investing in workers' attitudes affecting their responses to such changes.¹⁹⁴ In this section I will give the rest of the case that the company might have had the beliefs to make such a motive plausible. I will then offer evidence that they did in fact so invest, and in ways which suggest conscious design.

The historians' literature on Ford's motives requires me first to distinguish between reasons and causes. The appropriable profits stemming from the company's investments were a reason to forestall shopfloor organization. But Nevins writes that the Wobblies, who had tried to organize Ford in 1913, had only 200 card-carrying members in Detroit in early 1913; at the height of its activities in the city (culminating in the strike originating at Studebaker in June), he says, their total strength could not have been more than 2000.¹⁹⁵ This, he goes on to say, is insignificant in proportion to the 60,000 employees in the auto industry. He infers from this that the company would have been very foolish to see organization as a threat: the plausible

¹⁹⁴ The point of Matthewson, op. cit., is that formal organizations such as unions are not required for systematic restriction of output or other constraints on managerial authority.

¹⁹⁵ Nevins, op. cit., p. 522. The strike brought out 6000 all told i.e. roughly 10 percent of the industry's employment in Detroit.

reason could not be a cause. But a proper causal explanation for an intentional action must make reference to relevant beliefs. I think Nevins forms his opinion here too much in the light of the tactics and numbers of the Ford Service Department 15 years and more later.¹⁹⁶ I also think he underestimates the influence of ideas on the management and especially on Ford himself. These people above all others knew that what had been created was an enterprise of co-ordination. Would they have thought that an independent, countervailing, organization of their workforce threatened the enterprise at that particular moment in its--and Michigan labor's--history?

Detroit Saturday Night was, to judge from the prices in its advertisements, the subjects of its articles, and the length of its Society columns, the weekly of just these citizens of Detroit. It seems overwhelmingly likely that it regularly entered the homes of Ford and his senior colleagues and managers. In the month of January 1914 (the only one I consulted), no less than three separate issues feature articles or editorials about labor militant, frequently explicitly linking this with anarchism or dynamite or both.¹⁹⁷ The Wobblies were, of course, a particular bete noire of the editor ("the villainous heresy of

¹⁹⁶ He writes about the famous and dramatic collision between the Service Department and organized labor in Nevins and Hill, op. cit., chapters 2 and 6.

¹⁹⁷ I had been searching for references to shopfloor unrest in other auto firms in response to the new Ford wages.

the Industrial Workers of the World," "apostles of dynamite," etc.). The following passage from the issue of January 31 is atypical neither in its tone nor in the ambit of the fears it expresses.

He does not know that three men were murdered in their beds at Painesdale, Michigan a few days ago for no other conceivable reason than they had insisted on working in mines against which some of his anarchist allies had declared a strike. He does not know that an armed force of his allies have endeavored for months to subvert law and order in the upper peninsula of Michigan. If he knew these things he would of course protest. For Gompers is an honorable man.

Gompers! And one did not even have to read text to get the story. The endpiece to this manuscript is a Detroit Saturday Night cover from that month.^{100 100}

¹⁰⁰ The subject had been in local newspapers' columns for some time. Quite apart from coverage of the struggles at the Studebaker plant, the Detroit News for the month of May, 1913, shows prominent articles on the Patterson strike ("General Strike To Be Enforced in Patterson, N.J.: "We Will Win or Wipe City Off Map," Declares Labor Leader," May 18, p. 2), Wobbly organizers in Detroit ("Girl Socialist [Elizabeth Gurley Flynn], Known Here, Sways Workingmen by Her Marvellous Powers," May 19, p. 20), and the more lurid aspects of the aftermath of the events at Lawrence ("Bares More of Lawrence Strike 'Plant' [of dynamite]," May 21, p. 6). This is the coverage of the city's sound, conservative daily.

¹⁰⁰ The trade papers were not silent either. In April, The Iron Age had written "A fever of striking seems to have broken out in various parts of the country and in all kinds of industries. Some of the strikes have been brought about by the pernicious agitation of labor leaders bent on erecting as much trouble as possible for employers ..." and so on in that spirit. ("An Epidemic of Strikes," 91 Iron Age, April 17, 1913, p. 954.) On the following January 1, in a retrospective, they referred to strikes of common labor as well as skilled. See "A Year of Sudden Reverses in Iron and Steel," 93 Iron Age, January 1, 1914, p. 2.

Nevins's view of how the threat would have been perceived seems to me to be wholly unpersuasive. It takes into consideration neither what was happening to the production process (which was producing all the revenue) nor what the actors themselves are likely to have believed. That the threat was in the air seems beyond doubt. The Secretary's Report to the EAD Annual Meeting on February 17 was almost entirely about the Wobbly strikes in Akron at Firestone and in Detroit at Studebaker and the Burroughs Adding Machine Company. In the emotional climate of that winter an organization drive, and especially the return to Ford the Wobblies themselves had promised, would have frightened Henry Ford whatever their card-carrying membership.²⁰⁰ He did actually tell his intimate Galamb, the chief design engineer for the Model T and a man he had known for years, that "he would lick the I.W.W. by paying men \$5 a day."²⁰¹ This remark does not seem to be so widely known. But it has just the mixture of ingenuousness and low cunning students of Ford the man would recognize.²⁰² It is precisely the opinion which a number

²⁰⁰ Cp. Haywood (1916), p. 10581: "[Paid-up membership] is not the question How many people believe as we believe?" On the promise, see "No General Strike Now: Auto Workers Decide to Wait Until Fall," *Detroit News*, June 23, 1913, p. 2.

²⁰¹ Galamb, *Reminiscences*, p. 148.

²⁰² Compare the following anecdote, given in the *Brown Reminiscences*, about how Ford elicited more effort-intensive production from his workforce in the pre-Highland Park days.

He'd be out there in the factory, watching them and kidding them and telling stories. God! He could get anything out of the men because he just talked and would tell them stories. He'd never say, "I want this done!" He'd say, "I wonder if we can do it. I wonder." Well, the

of Detroit correspondents of ordinary American newspapers expressed in their dispatches.²⁰³ ²⁰⁴ It also fits in quite neatly with Ford's boast to Detroit Saturday Night's editor Nimmo the following week that there would now be no more excitement in Detroit labor circles.²⁰⁵ For the moment, at least, Ford had pre-empted the agitators.

How seriously should the economist take Ford's remark to Galamb? Assessing this requires analyzing who the Wobblies would have been taken by Ford and his associates to be. This is a more complex question than it may seem. A sensible answer to it only begins with who the Wobblies understood themselves to be--the focus of most writing about them.²⁰⁶ One must consider the means the Wobblies adopted--in practice as well as in slogans--to advance their ends. What impression would these have made on as

 men would just break their necks to see if they could
²⁰³ See, e.g., "Thousands Seek Share in Melons," Pittsburgh Sun, January 6, 1914, p. 1.

²⁰⁴ This put craft union leaders and prominent socialists in a somewhat delicate position when called upon to comment. Most seem to have felt obliged to congratulate him. The head of the Detroit Federation of Labor pronounced himself "gratified"; and he tried, not very successfully to disguise the fact that Ford had done this, and might well try to undo it, entirely unilaterally. ("[A] victory for the principles of trade unionism" was the way he put it.) See "Ford Factory Again Stormed by Job seekers; 12,000 Men on Hand Second Day after High Wage Announcement," Detroit Free Press, January 8, 1914, p. 3.

²⁰⁵ See Nimmo, op. cit., p. 9.

²⁰⁶ The outstanding secondary sources seem to me to be those of Brissenden (1919), Foner (1965), and Dubofsky (1969). Note that the first two, useful though they are, are particularly partial accounts--the first in terms of its coverage, the second in terms of its sympathies.

yet unorganized workers?²⁰⁷ What meaning might that have held for managers and proprietors? (This is in part a question about the sources and ideology of managerial authority.)²⁰⁸ This then brings us back to Ford. Was the Ford Motor Company just another firm in this respect, and therefore prudent to respond to the Wobblies just as other firms had, putting pressure on the civil authorities and perhaps even hiring the Pinkertons? Was there really enough special about Ford to call for some extraordinary response? In the remainder of this section I will address these questions. In Section 10, I will document and interpret the response Ford actually made.

The I.W.W. was certainly forthright about its objectives. Its original convention began with a clarion blast.

In calling this convention to order I do so with a sense of the responsibility that rests upon me and rests upon every delegate that is here. This is the Continental Congress of the working class. We are here to confederate the workers of this country into a ... movement that shall have as its purpose ... emancipation ... from the slave bondage of capitalism The aims and objectives of this organization [shall] be ... economic power and control of production and distribution without regard to capitalist masters.²⁰⁹

The preamble to their original constitution ran thus.

²⁰⁷ This is the question implicitly held up by U.S. Bureau of Labor Statistics (1912), p. 17.

²⁰⁸ I mean this in the sense of Bendix (1974).

²⁰⁹ Haywood (1929), p. 181.

The working class and the employing class have nothing in common. There can be no peace so long as hunger and want can be found among millions of working people and the few, who make up the employing classes, have all the good things of life

Between these two classes a struggle must go on until the workers of the world organize as a class, take possession of the earth and the machinery of production and abolish the wage system.²¹⁰

This was justified because

[The capitalists] take us into the mills before we are able--before we have even the semblance of an education, and they grind up our vitality, brain, and muscular energy into profits, and when we can not keep pace with the machine speed to its highest notch, they turn us out on the road to eke out an existence as best we can, or wind up on the poor farm or in the potter's field.²¹¹

Yet the workers were the ones who were responsible for the goods.

Commissioner Weinstock: If I was to come in and take possession of your property and throw you out, would I be robbing you?

Mr. Haywood: You have a mistaken idea that the property is yours. I would hold that the property does not belong to you; that what you as a capitalist class have piled up is merely unpaid labor, surplus value The IWW does not recognize that the bosses [and owners] have any rights at all.²¹²

²¹⁰ Brissenden, op. cit., p. 351.

²¹¹ St. John (1916), p. 1452.

²¹² Haywood (1916), pp.10581-82.

The organization's ultimate objective, then was to cause

... the wealth produced by [the organized wage-earners of the country] and by their collective efforts [to] accrue to those who are responsible for its creation without having to pay tribute to any employing class [or] any other parasitic class whatever.²¹³

There was eventually internal debate between the radicals, who may be thought of as philosophical anarchists, seeing a devolved rank-and-file movement operating through 'direct action and the general strike', and the conservatives, who sought to go forward 'under the protecting guns of a labor political party'.²¹⁴ But by 1912, the radicals had the momentum.²¹⁵ The slogan was 'One Big Union', the clientele the unskilled masses who were constituting an ever-growing part of the nation's workforce. The 'American Separation of Labor' might feel some need for respectability.²¹⁶ But these Wobblies saw themselves as incendiaries.

²¹³ St. John (1916), p. 1446.

²¹⁴ See Brissenden, op. cit., p. 231 (quoting Daniel DeLeon, the leader of the second faction), and also p. 94 (a Socialist Labor Party resolution). On the schism, see pp. 218-220, 231-238, and 352. See also Dubofsky, pp. 134-135, and Haywood (1916), pp. 10574 and 10583-84.

²¹⁵ For membership statistics which shed some light, see Brissenden op. cit., p. 359. As I discuss below, this may not be the most revealing way to measure influence. But the alternative--involvement in actual strikes--leads to the same conclusion. The radicals always seem to have led.

²¹⁶ "The AFL organizes like this"--[Haywood would separate] his fingers as far apart as they would go, and [name] them--'Weavers, loom fixers, dyers, spinners.' Then he would say: 'The IWW organizes like this!'--tightly clenching his big fist, shaking it

In McKees Rock and then, more and more in the eye of public attention, in the great textile strikes in Lawrence and in Patterson, they followed ferment, making of it what they could, a self-conscious vanguard perhaps, but a vanguard ever on the move.²¹⁷ Durable organization was not a real object, let alone a strength.²¹⁸ The Wobblies' grand desires were revolutionary. The means were to be the practical empowerment of the unorganized and of those too poor to have hitherto even contemplated withholding their labor. The Wobblies' approach to this empowerment lay as much in these workers' sense of dignity, and so of possibility, as it did in the bread-and-butter issues of some particular time and place.²¹⁹ So the I.W.W. saw little point to devoting scarce resources to grass-roots organization-building, and it left precious little of that sort in its wake. Wobbly energies went elsewhere: the spectacle of the strike was all.²²⁰ Of Lawrence, one of their founders said "Every hour that

 at the bosses." See Flynn (1973), pp. 131-132. The AFL wanted respectability, of course, to legitimate collective bargaining with employers.

²¹⁷ The dates of these strikes are July-September 1910, January-March 1912, and June-August 1913, respectively. On following ferment rather than starting it, see (for a contemporary and probably quite widely-read source) Dosch (1913), p. 411. On what could be made of it, *The New York Times Index*: 1912 entry for the Lawrence strike covers three-and-a-half columns of of fine print.

²¹⁸ Wobbly organizers left Lawrence directly the strike was over, and membership fell from 14,000 to 700 over the year following the strike. Brooks (1971), p. 122.

²¹⁹ Thus the famous "We Want Bread And Roses Too!"

²²⁰ "[O]nly through the actual struggle can the working class get its education for the seizure of power." Haywood (1929), p. 184.

the strike lasted the One Big Union idea was spreading like wildfire. The strikers of Lawrence were actually teaching the country how to fight."²²¹

On the other hand sustaining a strike of many individuals, particularly in hostile circumstances, required institutions; and the institutions the I.W.W. put into place in the course of conflict are well worth examining. These institutions built up a spirit of solidarity through making establishing practical images of respectability and community. I examine this in the case of Lawrence, the strike which first brought the Wobblies to real public prominence and was very widely reported.²²²

A Wobbly strike did not begin rich in material resources. The I.W.W. itself had essentially no strike funds, and contributions from other unions often had to be solicited, if they were to be got at all, in the face of resistance from the very craft union locals which had declined to organize the

²²¹ Jim Thompson in the Wobbly paper *Solidarity*, quoted in Brooks (1971), p. 122. Kornbluh (1972), p. 36, writes "The organization used the strike as a vehicle of agitation against the capitalist system and as a tactic to strengthen working class solidarity." She goes on to quote Tridon [(1913) I believe, p. 32] quoting an I.W.W. saying "Strikes are mere incidents in the class war; they are tests of strength [and] periodic drills in the course of which the workers train themselves for concerted action."

²²² See Foner (1965), p. 320, who says (in volume 4 of a very detailed study of American labor history) that it was at the time "one of the most widely reported labor strikes in American history."

strikers in the first place.²²³ The strike was sustained instead by immediate and persistent nationwide public appeals.²²⁴ The very scale of the individual donations massed together was a potent symbol to strikers of the objective justice of their resistance.²²⁵

The Wobblies were equally quick to dispose of the money in ways which carried the message clearly.²²⁶ Ethnic factions were from the start co-opted into the whole: the strike committee was carefully chosen large enough to have members for each sub-committee (relief, finance, publicity, investigation, and organization) from each of the fifteen major language and ethnic groups.²²⁷ Each member had alternates lest some small number of arrests disrupt the work. The clubhouses, meeting rooms, and

²²³ U.S. Bureau of Labor Statistics (1912), pp. 14, 17.

²²⁴ The principal vehicle, so far as I can make out, was speakers fanning out all over the country and passing the hat after every repetition of the speech. See, for example, Flynn, op. cit., p. 136.

²²⁵ In the Lawrence strike the daily sum was never less than \$1000. It was commonly closer to \$3000. (See U.S. Bureau of Labor Statistics, op. cit., p. 66.) The money was flowing to support the struggles of strikers whose weekly incomes, on the not so frequent occasions when the mills were running full-time, averaged \$8.76. (Ibid., p. 19.)

The ability of the Strike Committee to place the strikers' children with outside families will also have supported this impression.

²²⁶ Whether or not the arrangements described in the following paragraphs, again arrangements in place during the Lawrence strike, were typical of subsequent I.W.W. activities, the overall impression these created was probably the salient one for the general public. It was, after all, roughly the first impression, highly dramatic, and very widely reported and discussed.

²²⁷ Foner (1965), p. 318.

churches of all the groups were taken over for strike purposes. Family and community were adapted to the strike effort: communal meals were served to the single men and to those on the picket, neighbors and co-religionists doing the cooking and serving up the soup and stew on the long tables.²²⁸ The strike committee also saw to distributions of food to families, kept two doctors on hand, passed out coal and wood in the bitter winter weather, and acted as an intermediary in what amounted to a secondary rent strike. When individual families faced eviction, the committee advanced rent money. Food, shelter, warmth from the cold, the company and support of one's workmates and social community--all these tones of legitimation and community were struck. Daily mass meetings and frequent referenda to instruct the strike committee conveyed drama and a sense of radically democratic participation to the immigrant strikers as well as information.

The presence on the streets was no less focused and no less obvious to outsiders. "Never before has a strike of such magnitude succeeded in uniting in one unflinching, unyielding, determined, and united army so large and diverse a number of

²²⁸ U.S. Bureau of Labor Statistics (1912), p. 68. The food was more like the contemporary common table than real iron rations: bread, pressed ham, and tea one morning, with bread, beef, potatoes, peas, and tea that afternoon are one day's reported menu, with bread, potted meat, and tea followed by bread, beef, potatoes, carrots, turnips, and tea the day following. (Ibid.) "Everyone was served in abundance, and milk and sugar were provided for the tea." All this information comes from a report, sober and thoroughly unsensational in tone, prepared by a senior official of the Federal government.

human beings," wrote the conservative *New York Sun* on February 5. Quite promptly, essentially all of the polyglot workforce of the city's mills had come out--Italians, Poles, Lithuanians, Syrians, French, Belgians, Portuguese, Armenians, English, French Canadians, Germans, Irish, Latvians, and others who left no traces. At its peak, the strikers and their dependents came to nearly 60 percent of the city's population, according to the *Lawrence Daily American*.²²⁹ "It was not short of amazing, the power of a great idea to weld men together There was in it a peculiar, intense, vital spirit, a religious spirit if you will, that [this correspondent] never felt before in any strike."²³⁰

This spirit was no accident and was certainly not left to the enlightened self-interest Wobblies thought motivated craft strikes.²³¹ "It was the first strike I ever saw which sang," wrote one reporter.²³² This movement in Lawrence was strangely a singing movement. The strikers "were always marching and singing."²³³ The songs' words mattered, of course; but there was

²²⁹ A crude estimate based on numbers in U.S. Bureau of Labor Statistics (1912), p. 18, corroborates this.

²³⁰ Baker (1912), p. 30A.

²³¹ Perhaps for this reason too it alarmed the craft unionists. It certainly did alarm them. "John Golden, president of the AF of L United Textile Workers, denounced the strike as 'revolutionary' and 'anarchistic'. AFL president Samuel Gompers called it [critically, of course] 'class-conscious industrial revolution'." DeCaux (1978), p. 7.

²³² Baker, loc. cit. See also Dubofsky (1969), p. 242.

²³³ Mary Heaton Vorse, a contemporary journalist, quoted in Lens (1973), p. 169.

also symbolic unity in the singing together, not to mention the shared defiance of the po-faced owners and the more volatile militiamen and police.²³⁴ These police succeeded in forcing the frequent strike parades off the streets, only to find the paraders on the sidewalks, and occasionally marching through the town's shops and stores, much to the alarm of the town's proprietors.²³⁵ When the police tried to stop the picketing of individual factories, the organizers announced that sustaining the strike required a continuous moving picket--a human wall--around the entire factory district, twenty-four hours a day. The workers of Lawrence and their families turned out as required. There were sometimes as many as 10,000 people on this line.²³⁶ New England had never seen anything like it. The coverage in the national press reflected this.²³⁷

²³⁴ Indeed, the words emphasized this. "Solidarity Forever," the chorus to the I.W.W. anthem ran, "for (the) union makes us strong." The other famous lyrics began "Arise, ye prisoners of starvation! Arise, ye wretched of the earth! For Justice thunders condemnation. A better world's in birth. No more tradition's chains shall bind us; Arise, ye slaves! No more in thrall! The earth shall stand on new foundations! We have been naught--We shall be All!"

²³⁵ Foner (1965), pp.322-23.

²³⁶ U.S. Bureau of Labor Statistics (1912), p. 50. The New York Call, March 11, 1912, p. 1, put the maximum at 20,000. Perlman and Taft (1935), p. 272, in what seems a generally careful if committed study, credit the Call estimate. I suspect that the BLS figure comes from the Lawrence police and is an underestimate. The socialist Call, on the other hand, may well have been being a little wistful. Probably the true figure lies somewhere in between.

²³⁷ When the Wobblies first came organizing seriously in Detroit, well over a year after these events and to a city whose well-to-do probably thought it had nothing whatever in common with the depressed textile town, echoes were still audible. The Detroit News, which has paid some attention to the strike, ran an interestingly bitter editorial under the title "The Spirit of

The Wobblies' well-known exhortations to sabotage should be understood in this context of consciousness-raising.²³⁸

The strike is the open battle of the class struggle, sabotage is the guerrilla warfare, the day-to-day warfare between two opposing classes.

Sabotage means primarily: the withdrawal of efficiency. Sabotage means either to slack up and interfere with the quantity, or to botch in your skill and interfere with the quality of capitalist production or to give poor service. Sabotage is not physical violence, sabotage is an internal industrial process [It is] aimed at [a]ffecting the profit [of] the employer. Sabotage is a means of striking at the employer's profit for the purpose of forcing him into granting certain conditions, even as workmen strike for the same purpose of coercing him. It is simply another form of coercion.²³⁹

Sabotage was seen as an outward sign of an alternative community and an alternative set of interests. It was a gesture of

 Lawrence in Detroit". (Detroit News, June 21, 1913, p. 4.) It read, in part, "Those who read of the outbreaks of human passion, ignorance, and rebellion that charged the great textile strike in Lawrence Massachusetts will remember . . . the hosts of the I.W.W. . . . It all had such a far-off sound then." Apparently the way had been well-prepared.

²³⁸ The sabotage should, in any case, be imagined on the shopfloor rather than, say, as dynamite by night. Outside of the Colorado mine fields--where dynamite, as my supervisor puts it, was hardly an exotic commodity--I know of no confirmed examples of Wobbly dynamiting, popular belief on this point notwithstanding. The fact that the dynamite planted in Lawrence was subsequently discovered to have been planted there by agents of the mill owners may suggest to cynics a source of the popular belief. The political symbolism obvious in, for example, the Detroit Saturday Night cover reproduced below, may suggest another.

²³⁹ Flynn (n.d.), p. 5.

counter-vailing power. It may have looked to factory owners a more direct problem than the Wobblies' community-building, but it was not obviously a more serious threat.

The public seems to have perceived, at least dimly, the nature of that threat. To judge from newspaper articles and the like for the period of this study, the I.W.W. seemed to those not of the working class (and comfortable in that status) to promise a Hobbesian war of all against all, with 'the life of Man solitary, poore, nasty, brutish, and short'.²⁴⁰ The Wobblies appeared as anarchists and outside agitators: wild men from far-off and god-forsaken places whose subversive ideas, so alarming and so lamentably galvanic, would go away if only the men (and the Misses Flynn and Rabinowitz) themselves would.²⁴¹ The question of how the Wobblies could find success as agitators received less thoughtful attention.

The issue was very salient to those who ran and owned industrial companies. Ordinary middle-class people may well have feared the pillage of their homes and pondered anxiously the

²⁴⁰ Hobbes, Part I, Ch. 13. See, e.g., "Does IWW Spell Social Revolution?" *Current Literature*, April, 1912, pp. 380-388. R.F. Hoxie (1913), p. 789, writes of "the grim, brooding power which [the I.W.W.] is pictured to be in popular imagination."

²⁴¹ Thus, during and after the Studebaker strike, the *Detroit Free Press* repeatedly called for the AFL to step in, pre-empt the I.W.W., and generally do something. (See Foner (1965), p. 388.) This invitation will have come as a surprise, if a pleasant one, to the AFL: the *Free Press* had theretofore seen no serious place for unions of any description.

safety of their persons; but these sorts of issues of order and control were much less elements of their daily lives than matters they read about--probably more often in the editorial columns than elsewhere--in the newspapers. The situation was very different on the factory floor. There the problem was not the order of civil society. The problem was effort motivation and the legitimation of control, with real property and working capital, not to speak of the right to the profits to be had from using them, hanging in the balance. Factory owners would have been distinctly uneasy.²⁴²

It is something of a commonplace that by the turn of the century American industry faced a crisis of authority on the shopfloor. The late nineteenth century saw the rise of craft unionism and the beginnings of the American Federation of Labor. Strikes and other forms of struggling over job control were on the rise.²⁴³ They derived from the ability of the workers in question to control the relevant labor supply and, ultimately, from the fact that it was workers rather than managers who knew how to get the jobs done.²⁴⁴ Thus effort norms (or, from the

²⁴² See Dubofsky (1969), pp. 258-259. See also Brandes (1976), p. 1. Contemporaneously and most locally, see "Urge Secret War on Auto Factories," *Detroit News*, June 21, 1913, p. 10.

²⁴³ "Between 1880 and 1900, nearly 23,000 strikes affected more than 117,000 establishments. That was an average of three strikes a day for twenty years." Brandes, loc. cit.

²⁴⁴ Whence the Wobblies' Haywood's much quoted remark that "the boss's brains are under the workman's cap". (See, e.g., Montgomery, op. cit., p. 9.)

opposite perspective, effort incentives) became a central issue. Management was beginning to emerge as a recognized profession at this time.²⁴⁵ Its societies were mostly societies of engineers, and the most famous meetings of the most famous one--the American Society for Mechanical Engineers--were discussions of labor control and effort extraction: there were discussions of cost-accounting, to be sure, but the bulk of what is remembered concerned incentive-oriented compensation schemes and organizing from the top down the flow and pace of materials on the shopfloor.²⁴⁶

Two themes emerge from these discussions. Managers were very concerned to get workers to regard themselves, for purposes of work control, as a mass: workers were to be task-executors, not task-definers. For purposes of compensation, on the other hand, workers should see themselves as individuals: endless hours were spent discussing how best to subvert group effort norms.

²⁴⁵ Lazonick (1984), pp. 13-29 passim.

²⁴⁶ See Noble (1977), pp. 263-266. The call-to-arms seems to have been Towne (1885-1886), a talk entitled "The Engineer as Economist". The first substantive studies were Metcalfe (1885-1886) ("The Shop-Order System of Accounts"), Partridge (1887) ("Capital's need for High-Priced Labor"), Fowler (1888) ("Estimating the Cost of Foundry Work"), Towne (1888-1889) ("Gainsharing"), and Halsey (1891) ("The Premium Plan of Paying for Labor"). Taylor's famous papers "A Piece Rate System" (1894-1895) and "Shop Management" (1902-1903) are subsequent contributions in this series. (American Society of Mechanical Engineers Subcommittee on Administration (1912) is a survey contemporary to the events at Ford and quite interesting in its own right.)

The Wobblies represented the most direct sort of challenge to this. In the small they proposed active subversion of managerial control; in the large they advanced an alternative political vision, complete with a very different view of the sources of legitimate authority, appropriate criteria for the division of rents, and so forth. Ford's idea of selling to a mass market required, for practicality, a production process capable of really large-scale production. The scarcity of organization capital meant intensive production rather than replicating the familiar small production units. The American system had, in effect, taken care of the task-definition problem. But the problem of group norms--most vividly summarized by late 1913 in the question 'Who shall determine the pace of the line?'--was still unresolved. In the presence of those proposing a novel source of authority, it was troublingly unresolved. Authority deriving from the legal institutions of property and the sanctity of the labor contract had no appeal for such men: they consciously rejected the assumption.²⁴⁷ Authority simply imposed by main force promised no greater loyalty and the threat of violent and embarassingly bloody if only temporary disruptions. The isolated troublemaker could easily be identified and expelled--indeed, could be identified, dismissed, and replaced without slowing down the line to any great extent or even incurring great expense in subsequent training. But

²⁴⁷ See, e.g., St. John (1916), p. 1456.

collective action could not be so easily thwarted. The disruption and training costs an entire functional unit could impose were far from trivial. It is in this sense that the "insiders" about whom Lindbeck and Snower write possessed real power.²⁴⁸

And Ford's very success in organizing large scale demand and production made the costs of such disruption very high indeed. To a first approximation, neither his physical capital nor his organizational capital could be used, at least in the short run, to produce anything but Model T's. A crude underestimate puts the costs of disrupted Model T production in 1913 at well over half a million dollars a week.²⁴⁹ A comparable figure for the whole of the contemporary General Motors--and so certainly an overestimate--would be about one-third of that sum.²⁵⁰ And the differential would have been far greater for any sort of extended shut-down: GM made cars then using an artisanal production process, with highly skilled mechanics and general-purpose

²⁴⁸ Lindbeck and Snower (1986a) summarizes their work. Their (1984) is the most germane variant, but it really does require interpretation (e.g. like this). See also their (1986b).

²⁴⁹ See the note to Table 22.

²⁵⁰ General Motors was at that time a holding company. A more apt--and more dramatic--comparison would be to compare the Ford figure to an analogous figure from some one GM company (i.e. factory). The most interesting one for this purpose would be Buick, since it had received the Flanders treatment (from Walter Chrysler--see Chrysler (1938), p. 32) but did not have American System production, let alone the dedicated equipment and so forth of the Highland Park plant. But the Buick figures are not published separately. Perusal of Moody's for 1917 suggests the sum would be an order on magnitude smaller. See Table 22.

Table 22: Crude measures of automobile firms' foregone output costs circa January 1913

Company	Annual profit	Profit/ production wk.
Ford	27 087 204	541 744
General Motors	8 184 054	183 911
Willys-Overland	5 864 858	131 911
Packard	2 364 568	53 136
Studebaker	1 905 413	42 818

The figures in the second column are those in the first divided by an estimate of the production weeks per year at this time in the relevant factory or factories. Ford is known to have operated on a roughly fifty-one week year, having closed, ostensibly to take inventories, for the first few days of October as well as for Christmas and so forth. Production weeks in the year for other firms, whose business will have been much more cyclical than Ford's, was calculated in the proportion to full-time production as Brissenden (1929), p. 381, shown annual earnings standing to full-time earnings for auto workers in 1914.

As discussed on in the text, these statistics overstate the shut-down costs of all firms but Ford as their physical capital was less dedicated.

Source: Ford (calendar year 1913): See Table 12 above. General Motors (calendar year 1913): General Motors (1914), p. 5. Note that this represents the output of at least three factories. Willys (1913-1914): Moody's (1917), p. 2049. Packard (1913-1914): Moody's, op. cit., p. 1364. Studebaker (calendar year 1913): Moody's, op. cit., p. 1742. Note that this represents the output of two factories.

machine tools. The latter, and the loyal elements amongst the former, could in principle be leased out. Little comparable could have been arranged at Ford. In short, Ford faced the same sort of problem from the Wobblies all other employers did. But the problem confronted Ford on a much, much larger scale. And because of the changes in production practice Ford was wreaking, the company was an especially obvious target. Nevins may have been right that the company need not have worried about the Wobblies per se. But Wobblyism was a clear and present danger.

10. Inside the Workers II: Means and Execution

One way to lend weight to this interpretation would be to show subsequent actions of Ford management which the interpretation explains neatly. I now turn to this. I take 'explaining neatly' to mean 'explaining in terms of a coherent theory relating means and ends'. The theory I have in mind is most easily motivated through a brief discussion of the famous home investigations of the Ford Motor Company Sociological Department.²⁵¹

Two interpretations of these elaborate 'investigations' have become traditional. Neither takes seriously the idea that the visitors were only seeking information. Nevins and the men of the right see the activities as simple good works, paid for by an uplifting employer. It is paternalism, but it is benevolent paternalism.²⁵² Ford had a vision of the way life ought to be lived. He wished to give his employees the means to do so. But he had no intention of allowing those means to be frivolously squandered. Thus the purpose of the visits was a sort of

²⁵¹ The Department was set up in parallel with the five-dollar day. Its origins are discussed below to begin the body of this section. Its investigations were referred to briefly at the end of Section 3 above.

²⁵² The canonical text here is Nevins, op. cit., ch. 21.

sociological evangelism. This fits in neatly with Nevins's consistently high-minded view of Ford's purpose: the chapter about the eventual demise of these particular arrangements is entitled "Labor: A Bright Dawn Pales".²⁵³ But others take a different view, the material benefits to those on the plan notwithstanding. Meyer, with the men of the left, sees an unprincipled intrusion into the private lives of autonomous employees with the straightforward instrumental aim of increasing their physical strength and their financial dependence. The investigations are paternalism, and they are more impertinent than kind.²⁵⁴ These seemingly polar views, however, do not exhaust the alternatives.

My argument thusfar suggests a third perspective. One should thus ask of the Department's activities as much as of the \$5 wage the question "How might this work to maximize profits?" The idea in the background, of course, is that the Department's activities were (expensive) attempts to change relevant attitudes and beliefs amongst the workforce.²⁵⁵ In short, they were an

²⁵³ Nevins and Hill, op. cit., ch. 13.

²⁵⁴ If not worse. Gartner (1986) is the other recent study touching on these matters in this spirit. I imagine, on the basis of Noble (1977), ch. 10, that Noble shares this bitter perspective.

²⁵⁵ One doesn't think the Marine sergeant harasses his boot-camp trainees about their shoeshines and their bed-making technique to make them more effective soldiers in any direct way. When he tells them disdainfully, in early physical training, that they are not worthy of being called Marines, he does not hope they will give up and go away. He is nonetheless trying to form ultimately helpful attitudes--pride in works, pride in community--which turn on a sense of initiation and membership. He is culture-making.

investment, just an investment in ideas rather than machines, and in the long run they were viewed as one of several substitute methods of keeping down costs.²⁵⁶

In the remainder of this section I will offer four sorts of evidence in favor of this 'economic' interpretation of the Department's several activities. First, I will describe the Department's origins and verify that the expense of running it was substantial. Second, I will give some information about the work force which leads me to believe the men would in fact have been amenable to suggestion. Third, I will quote internal communications of the Department which strongly suggest that the message home investigations will have carried to the visited, pace some leftist commentators, was precisely the one I argue that the visited wanted to hear.²⁵⁷ Finally, I will consider the pedagogy and some teaching materials and rituals from the famous Ford English School's Americanization classes. These, I will urge, make extremely plausible the view that the classes will have (successfully) carried the same message. The section then closes with statistics on the history of employment rents at Ford. These too support the 'economic' interpretation.

²⁵⁶ This is, by the formal conventions of neoclassical economic theory, a somewhat peculiar approach to individual choice. Economists are accustomed to identifying agents with their preferences, not their impressions. I discuss the approach's peculiarity and its attractiveness, and what believing it entails concerning method in economic history, in Appendix III.

²⁵⁷ See, e.g., Gartner, p. 225, who writes of "a cultural offensive against immigrant and working-class cultures".

This approach of interpreting specifically economic history only in the context of contemporary technological developments and social attitudes brings into sharp focus a certain vagueness --about exactly what happened when--in the standard secondary works on the history of welfare capitalism.²⁵⁸ In Section 11, I explore more fully than these standard accounts do precisely where the Ford episode fits into that history and why the actual timing of that history proceeded as it did. The essay then ends with a conclusion covering analytic points and an epilogue tying up historical loose ends. Some texts of original documents and the appendix on method mentioned in footnote 256 above follow thereafter.

The archives yield no primary source information on the genesis of the idea of the company having a Sociological Department. But newspaper articles in the week of the announcement already refer to a regime in which employees would be paid the previous going wage until cleared by Sociological Department investigators. The workers would then be put on the

²⁵⁸ Brandes's (1976) monograph is taken by most writers as the definitive account. Brody (1980), an essay, disagrees with Brandes on some matters of interpretation but accepts his substantive account and in any case makes virtually no reference to events before the end of the first World War. Many well-known works on related subjects--perhaps most notably Bowles and Gintis (1976), ch. 7-8--take this conventional line on what happened when, and why, quite uncritically. Bowles and Gintis hardly even trouble to state their assumption on this, so obvious does it apparently seem to them.

supplement to bring their weekly total to five dollars (in the scheme's beginning, retroactive to the announced starting date for the scheme). The purpose of the investigations was described in the announcement: to confirm that the worker is sober, saving, steady, and industrious, and would not waste the money on riotous living. Investigators inquired about the worker's marital status, dependents, nationality, citizenship, religion, housing arrangements and conditions, diet, personal hygiene habits, forms of recreation, savings and debts, and so on.²⁵⁹

Considerable forces were assembled to carry out this work. There were initially 50, then 100 investigators, their numbers complemented by drivers and interpreters. The number of investigators grew to 200 before declining.²⁶⁰ The only cost figures which seem to have survived show expenditure on the Department for 1915 running at \$108,000.²⁶¹

All production workers were to be investigated. In early 1914, this body of men was 71 percent immigrant, and a large number of those spoke no English.²⁶² They would have arrived in

²⁵⁹ For transcriptions of several reports, see Emmet (1916), pp. 98-106.

²⁶⁰ Abell (1914b), p. 307; Ford Motor Company (1916), p. 7.

²⁶¹ Ibid. (The footnote giving the figure's source does not enable that source to be traced.) I suspect that this number is in fact too low. At \$5 a day, which is presumably the least the investigators were paid, this sum would only extend to 70 man-years even if there were no overhead, drivers, and so on.

²⁶² Arnold and Faurote, op. cit., p. 47. Lee, op. cit., p. 305, says that 50-60 percent of the workforce did not speak English at the time. A "Record of Investigations" memo transcription in

Detroit relatively recently and would have lived in ethnic communities either squeezed in between factories downtown or on the West Side.²⁶³ We have a certain amount of evidence about the conditions of life on offer there. The single men either boarded with other immigrant families or lived in boarding houses. The frequency with which one reads in contemporary documents of the beds being used in shifts suggests that the environment was impersonal. The families themselves generally rented tenement slum buildings. The standard of accommodation was not high. Plumbing, for example, was generally outdoors. In the poorest neighborhoods, it was indoors but near the other pipes i.e. in the kitchen.²⁶⁴ On the other hand, for much of the day that may have been the least crowded room in those houses.

The point to bear in mind is that this was the sort of life that went along with the market-clearing wages for basically unskilled labor i.e. \$2.34 a day. Workers with significantly better incomes could afford something very much superior. Home could be a proper house, physically substantial and offering its

Ford Archives Accession 940, Box 13, gives the figure of 36 percent for January, 1914. Whichever, the number was clearly a large one. Nevins, op. cit., p. 553 writes "At the Ford plant the foundry workers, common laborers, drill press men, grinder operators, and other unskilled and semi-skilled hands were likely to be Russians, Poles, Croats, Hungarians, or Italians; only the skilled employees were American, British, or German stock."

²⁶³ The great bulge in Detroit's population up until then was going on at the time. For details, see Zunz (1982), p. 286. For Detroit's residential geography in 1910 and 1920, see *ibid.*, parts III and IV.

²⁶⁴ Zunz (1982), p. 377.

inhabitants some modicum of privacy. (This will have had moral connotations as well as practical consequences in those times.) The house could be owned rather than rented. It could stand on a spacious lot and have windows which filled with light. It could even have indoor plumbing, hooked up to bathrooms. Five dollars a day could, in particular, buy the very image of prosperous, individualist yeoman independence.

What did these people make, then, of the investigators and of being investigated? What would it have meant to them? To answer these questions we have to dig a little deeper than the inventory of information the investigators were bidden to obtain. We have to grasp, somehow, what will have been conveyed. The announcement had had the air, after all, of partnership about it, of rights compensating the workplace burdens and responsibilities. The enterprise was not a company but a house i.e. a home. Those who would share in the comforts it might offer would have to be certified as deserving to do so. But all were expected to deserve to share: this house/home was capacious and embracing.²⁶⁶ Even the self-congratulation rings more hortatory than descriptive. Yet the investigators came to the workers with a long list of probing, extremely personal questions and, it seems, with rather strong views on the desirability of a

²⁶⁶ "Home is the place where, when you go there/They have to take you in." Frost (1949), p. 53.

certain middle-class regularity of life as well.²⁶⁶ What will the poor immigrant workers have made of it all?

The best place to start seems to be with the charge the investigators received. John R. Lee, the founding director of the Sociological Department, spoke thus the last time he addressed the assembled investigators.

[We] have heard many say that ... the most substantial thing we [are] doing [is] giving non-English-speaking men an idea of the English language.²⁶⁷

Did he believe it? The speaker who followed him, giving less a valedictory than an inaugural, certainly did not.

I know you men must run up against some awfully discouraging cases. You have got to be able, in spite of the things you meet, to believe in men and to keep your courage up in the face of discouragements, [for] in order to make a man trust himself you have first got to trust him. There are a lot of workmen in this world who have got a lot in them, who aren't doing their best simply because nobody has ever come to them and told them, "Here, old fellow, you've got a lot more in you than I've seen."²⁶⁸

²⁶⁶ Some examples will illustrate. They were keen to suppress drinking and gambling, and were very keen indeed on marriage (though not on working wives). They were strongly in favor of bank accounts, life insurance, and mortgages. They were hotly opposed to (the wife) taking on a boarder.

²⁶⁷ "Meeting of the Sociological Department," May 12, 1915, in an untitled bound dittoed manuscript published by the Ford Motor Company Sociological Department in 1915, located in Ford Archives Small Accessions, File 1018, Box 25, p. 3.

²⁶⁸ Ibid., (Marquis speaking), p. 6.

The speaker here is Marquis, the clergyman, in his first speech replacing as Sociological Department head the old personnel man Lee. The five-dollar day brought the promise of material success for the 'aliens', of course, and we shall see there was the prospect of political inclusion as well. But what leaps out from Marquis's first address is its diction of moral uplift.²⁶⁹ It would not have been lost on his listeners that these words were not just fine words: they were to be accompanied by a handsome tender of interest and self-denominated trust. Henry Ford said he preferred to give the workers the money instead of spending it for them. Those who were not up to the responsibility might lose the privilege, but it was for them to decide whether or not to seize the extraordinary opportunity the company offered them to lead a respect-worthy life. Were the investigators to be neutral observers? "I simply [suggest]," Marquis went on,

... that you light the fires of hope where they have gone out, that you tell men not only their faults and mistakes, but also tell them of their virtues, that you give a man a brace once in a while for making good,

²⁶⁹ Nevins (op. cit., p. 549) says the workers "gained personal prestige" from their association with the company and so wore their numbered badges with pride "to dances and other social affairs". It sounds very plausible to me, just likelier connected to living a respectable and so successful life in the new land than linked in any direct way to submission to the discipline of the line during working hours and the money this brought. The pride came from meanings, not acts per se.

that you go into the business, along with the other things you are doing, of giving encouragement²⁷⁰

It was indeed for the workers to choose. But the investigators could help them make the choices which would 'turn around'--that is, elevate--and even, in a humble and distinctly American way, enoble their lives.²⁷¹

The investigators set to their work, and they did not lack for flair. Here is F.W. Andrews writing up a case report on Joe Kostruba, a Russian emigrant and family man then three years in America.

Life has been an uphill struggle for Joe since landing in America. He was a willing worker and not particular about the kind of employment he secured. For a time he worked digging sewers, then moved his family to [the Michigan beet fields] where he could support them in a way. Last spring he was unable to obtain ... work and moved ... to Detroit He went to the [Ford] Employment Office ... and was ... hired. Two days later an investigation was made to determine the man's eligibility to share in the profits of the company.

The investigator found him located ... in an old, tumbled- down one and a half story frame house. Four families lived there, one a negro family. Joe's apartment was one-half of the attic, consisting of three rooms, which were so low that a person of medium height could not stand erect--a filthy, foul-smelling hole.

²⁷⁰ Ibid., p. 8.

²⁷¹ Thus Purves (1915): "[T]he objective of the investigation is to help and not to cause trouble for an employee."

The family consisted of a wife and six children [ranging in age from a fifteen year-old to a nursing baby] [The] home was furnished with two dirty beds (one of which was occupied by the five five children who slept crossways in same), a ragged and filthy rug, a rickety old table, and two bottomless chairs (the five children standing up at the table to eat). The wife and children were half clad, thin, pale, and hungry looking

Their rent was past due; credit with the grocer and the butcher was exhausted; and six cents represented their cash on hand.

A basket of provisions was taken to their home that very night [T]he officials of the company armed the investigator with a \$50.00 bill and instructed him to relieve [the] family's immediate wants, and to help them make a start toward right living.

Back rent was paid; grocery and meat bills settled and a five-room cottage rented a few blocks away. Enough moderate-priced furniture for comfort was bought; the kitchen was stocked with pots, pans, and provisions; coal supplied, and a liberal amount of soap was bought with instructions to use it freely, and cheap dresses were purchased for the wife and children.

Here ceases mere enterprise and expeditiousness: the rest is spectacle.

When this was accomplished, the investigator had their dirty, old junk furniture loaded on a dray and under cover of night moved them to their new home. [The] load of rubbish was heaped in a pile in the pack yard, a torch was applied, and it went up in smoke.

There, upon the ashes of what had been their earthly possessions, this Russian peasant and his wife, with tears streaming down their faces, expressed their thanks and gratitude to Henry Ford, the FORD MOTOR COMPANY, and all those who had been instrumental in bringing about this marvellous change in their lives.²⁷²

²⁷² Human Interest Story Number Nine, in the SS Marquis Papers.

Indeed, Joe and his wife were not as demonstrative as some. Mustapha the Turk, who 'put aside his national red fez and praying,' started to dress 'like an American gentleman' and grew 'anxious to send for his young wife and child to bring her to America to live happily through the grace of Mr. Henry Ford' knew he ought to show he understood what had transpired. What was appropriate response to the opportunities he had been given? "Let my only son be sacrificed for my boss [Mr. Ford] as a sign of my appreciation for what he has done for me," he said. "May Allah send my boss Kismet."²⁷³ These vignettes call up echoes, not obviously misleading, of burnt offerings and an old, old story.²⁷⁴ Even discounting both the rhetoric of these texts and their preservation by the Sociological Department for the natural motives of the reporters and their employers, it seems clear the company wished the workers to understand they were not simply being paid in cash. The company offered them opportunities and interventions no ordinary market transaction could command. They weren't meant to feel merely satisfied. They were meant to be grateful.

Welfare work--the provision by companies of amenities beyond simple financial compensation--was hardly unknown in America at

²⁷³ Human Interest Story Number Thirty-Eight, S.S. Marquis Papers.

²⁷⁴ Genesis XXII 1-12.

the time.²⁷⁵ But before the Ford program, essentially all other American welfare work had a very different character.²⁷⁶ The common arrangement was for the company to provide goods and services--housing, flower beds, parks and libraries, elementary schools, teachers, medical clinics and staff.²⁷⁷ There are two salient aspects to this approach. The company made the decisions on behalf of the workers. And the emphasis in the companies' presentations of their good deeds--to the workers as well as to the wider world--was on the expanded consumption opportunities and heightened standard of living they were providing. At Ford, choice lay with the workers.²⁷⁸ Some people said poor and ignorant foreigners would only squander the money, but the Ford Motor Company didn't believe it: advice and counseling would be made available (and it was no accident the program was soon headed by a prominent clergyman), but few Ford men would behave so badly. And so opportunity seized was presented as an index of status, of moral valuability, and nothing so crass as a simple means to consumer's satisfaction. Furthermore, the company's generosity made all this possible; and the company did not fail to remind its workers of the fact.²⁷⁹

Persuading a large and potentially undisciplined workforce to come to work on time, not leave early, and work in a steady

²⁷⁵ Tolman (1909) lists an enormous number of examples.

²⁷⁶ Section 11 below goes into details.

²⁷⁷ See, e.g., Otey (1913) *passim*.

²⁷⁸ Ford Motor Company (1916), p. 5.

²⁷⁹ Table 23 records some participation history.

Table 23: Profit-sharing participation at the Highland Park plant

Date	(i)	(ii)	(iii)
April 1914	57.1	28.1	14.7
July	84.0	8.1	7.7
September	82.8	5.6	11.6
December	87.6	3.6	8.8
May 1915	59.6	2.8	37.6
November	74.4	2.0	23.8
July 1916	64.2	1.2	34.6
November	68.6	0.6	30.8

(i) Percentage participating

(ii) Percentage not participating but eligible

(iii) Percentage not participating and ineligible

When the percentage not participating but eligible is relatively large, this is usually put down to "poor home conditions". For categories and a breakdown, see the source, p. 108. When the percentage ineligible is relatively large, the principle reason is that the workers are new hires. For a breakdown, see the source, p. 109.

Source: Emmet (1916), p. 107.

and systematic fashion was not a new problem in the organization of industry in 1914. The other instance known to economic historians concerns the making of an industrial work force in the earlier great transition, when the first British capitalist manufactories required laborers. E.P. Thompson summarized the task confronted then neatly: the owners of the fixed capital needed to create "new disciplines, new incentives, and a new human nature upon which these incentives could bite effectively."²⁸⁰ For adult workers, the carrot seems to have been a more attractive instrument than the stick.²⁸¹ But even so, St. Monday seems to have been a singularly long time in dying.²⁸²

And Ford needed active cooperation. He needed the worker to want to be part of a collective enterprise, to want to belong. That his workforce was so heavily newcomers, self-conscious outsiders, was a great opportunity. The other means by which the company took advantage of this fact was its venture into adult education, the Ford English School.

²⁸⁰ Thompson (1967), p. 57. (See also McKendrick (1962) and Pollard (1965), ch. 5.) Note that Thompson's view of an abrupt transition from the way Englishmen previously earned their livings is not universally accepted. See, e.g., Hill (1967). A recent and more direct challenge, albeit couched in the guise of a parallel discussion of the analogous transition in Japan, is Smith (1986).

²⁸¹ Pollard (1964), pp. 186-92.

²⁸² Ibid., pp. 181-82; Reid (1976).

This school taught a practical command of the English language and, through its selection of teaching materials, a quite detailed vision of the forms of respectable life and values. Belonging and participating, "each in his own place" in the words of the materials' author, were the themes.²⁰³ Even the pedagogy wore these themes on its sleeve.

The Peter Roberts system [which] has been adopted ... is based on the dramatization of all sentences; that is, the acting out of all the ideas to be conveyed Remarkable results have followed the use of this plan.

The teacher recites a sentence and performs the actions that illustrate it. For example, an instructor says, "I wash myself," and goes through the motions while saying the words. He will say, "I comb my hair," or any of the many expressions dealing with simple actions. As soon as they are able, the class repeats the sentence in concert.²⁰⁴

Some instructors were said virtually to undress themselves in the explanation of hygiene.²⁰⁵

The men thoroughly enjoy this form of instruction, because it presents the carnival spirit, a sense of co-operation. Twenty-five men shouting the lesson together arouse a good deal of feeling and in a few minutes the day's work is forgotten. The time flies, and the hour and a half session is all too short. So

²⁰³ Roberts (1920), p. 226. Korman (1967), p. 147, writes "[T]he substance of [the Ford course] was safety, shop discipline, welfare, and the company's benevolence."

²⁰⁴ "Assimilation through Education," 9 Ford Times (1915), p. 410.

²⁰⁵ Roberts's courses all seem to have material explicitly about bathing. See, e.g., Roberts (1910), p. 25.

interested are some of the men that they will remain
 mong after the class is dismissed in order to receive
 special instruction²⁸⁶

One must ask oneself whether the second paragraph of this passage is really an adequate explanation. Was this simply another vehicle of instruction, the more successful because language students always a little timid? There is certainly something to the view that language acquisition goes most swiftly and easily when the words are tools rather than objects and when the student can imagine themselves living out the texts. But these students did not simply want to imagine themselves as the American instructor, speaking American English and acting out the quotidian gestures of American life. They ached for it. The passage continues thus.

The attitude of the men towards the school is one of eagerness to learn. Although each pupil is required to attend school but twice per week, many have asked permission to attend four times.

It was a life-line to respectability, and its echoes were heard in the workplace itself, not least because a significant amount of the material was less about what one might want to do than about what one surely ought to do. This material on "everyday life in the home and factory" ran from the responsibilities of being the head of an American family to those of citizenship

²⁸⁶ Ibid.

(which involved fairly clearly the idea that politics was an activity confined, for citizens, to the first week of November) to those of discipline and subordination on the shopfloor.²⁸⁷ Only a few of the Ford English School lesson texts seem to have survived, but there is good reason to think the lesson on workers' needs in daily factory life included something like the following.^{288 289}

I hear the whistle. I must hurry.
 I hear the five-minute whistle.
 It is time to go into the shop.
 I take my check from the gate board and hang
 it on the department board.
 I change my clothes and get ready to work.
 The starting whistle blows.
 I eat my lunch.
 It is forbidden to eat until then.
 The whistle blows at five minutes of starting
 time.
 I get ready to go to work.
 I work until the whistle blows to quit.
 I leave my place nice and clean.
 I put all my clothes in my locker.
 I go home.²⁹⁰

²⁸⁷ Ford Motor Company (1920) p. 32.

²⁸⁸ The Ford texts which have survived appear to be limited to those in Ford Archives Small Accessions File 1544.

²⁸⁹ Peter Roberts, the course's author, wrote the following and its companion texts for his previous client. See Lee, op. cit., p. 305, and Korman (1967), p. 147. See also Roberts (1910), which discusses a comprehensive course in thirty lessons. Ten are on domestic life, ten on "experiences in the industrial world" (p. 22), and ten are on commerce and business (letters and the postal system, pay-day, banks, housing, etc.). The industrial series includes (p. 23) "Going to Work", "Beginning the Day's Work", "A Man Quitting His Job,", "A Man Looking for Work", and "Finishing the Day's Work".

²⁹⁰ Korman (1967), pp. 144-45, quoting 3 Harvester World (1912), p. 34.

The image of the grimy worker turning from his bench proudly to "yell to a teacher passing by 'We are good Americans!'" is a striking one.²⁹¹ "[A]s we adapt the machinery in the shop to turning out the kind of automobile we have in mind," said Marquis in a speech to educators, "so we have constructed an educational system with a view to producing the human product in mind."²⁹²

The company was at pains to advertise the adaption and engrossment. The Ford Times published the following in 1915.

[For] the second time within a month ... the men of the Ford English School have come prominently before the public in a way to command admiration and respect. [The first was the recent Commencement Exercises;] the other ... was on July 5, celebrated throughout the country as Americanization Day.

On that day, all foreign-born employees of the Ford Motor Company were invited to unite in a monster parade, and fully five thousand were on hand. Led by 1,600 pupils from the Ford English School and a detail of Boy Scouts, these workers surprised all spectators by the orderly manner in which they marched the two miles to City Hall.

At that point a halt was made long enough for the men to unite in singing "America," which they had learned in the school.

At the conclusion of the singing, the crowd which packed the square cheered again and again. Mayor Oscar B. Marx, in a short talk, expressed his appreciation of the spirit displayed by the marching thousands.

²⁹¹ DeWitt (1919), p. 118. It will come as no surprise to discover that the instructors were entirely Ford Motor Company employees. See Lee, loc. cit.

²⁹² Marquis (1916), p. 916.

From the City Hall, the march was continued to the river, where ferry boats were waiting to convey the men, with their families, to Belle Isle, the city's beautiful park for the civic exercises and a day of recreation.¹⁰³

This was obviously a powerful experience. But it was mundane in comparison to the climax of the English course itself.

The 'Melting Pot' exercises were dramatic in the extreme. A deckhand came down the gangplank of the ocean liner, [its hulk and deck] represented in canvas facsimile.

"What cargo?" was the hail he received. "About 230 hunkies," he called back. "Send 'em along and we'll see what the melting pot will do for them," said the other and from the ship came a line of immigrants, in the poor garments of their native lands. Into the gaping pot they went. Then six instructors of the Ford School, with long ladles, started stirring. "Stir! Stir!" urged the superintendent of the school. The six bent to greater efforts. From the pot fluttered a flag, held high, then the first of the finished product of the pot appeared, waving his hat. The crowd cheered as he mounted the edge and came down the steps on the side. Many others followed him, gathering in two groups on either side of the cauldron. In contrast to the shabby rags they wore when they unloaded from the ship, all wore neat suits. They were American in looks. And ask any one of them what nationality he is and the reply will come quickly, "American!" "Polish-American?" you might ask. "No, American," would be the answer. For they are taught in the Ford School that the hyphen is a minus sign.¹⁰⁴

"Any spectator . . . saw the pride which shone from the former aliens' faces as they waved little flags on their way down the steps from the huge cauldron, symbolic of the fusing process which makes raw immigrants into loyal Americans."¹⁰⁵

¹⁰³ "From Codfish to Motorcars," 9 Ford Times (1915), p. 31.

¹⁰⁴ "The Making of New Americans," 10 Ford Times (1916), p. 151.

¹⁰⁵ Ibid.

In its first five years of operations, the Ford English School graduated roughly 16,000 people.

It is a noteworthy postscript to all of this that Ford's overall compensation rates--that is, wage plus profit share--remained fixed in nominal terms until 1919 (quite independent, that is, of changes in the 'profits of the house'.) By that time, shifts in the supply and demand for labor had caused the company to change the balance between the starting wage and the profit share (in nominal terms) heavily in favor of the former. And inflation, which had been a serious consideration in Detroit since 1916, had eaten away the real value of the whole five dollars to a level only barely above that of the wage prevailing in late 1913 i.e. just before the original announcement. So the rent to being employed at Ford had slowly been withdrawn. (Table 24 illustrates.) Given what else was going on, it is difficult to avoid the impression that high real wages and socialization were substitutes in the mind of the company when it made its first decision.

Table 24: Employment rents at Ford 1914-1919

Starting date	Wage component (nominal)	(\$ 1914)	Profit-share
January 12, 1914	\$ 2.34	2.34	2.66
December 10, 1914	2.72	2.72	2.28
October 10, 1916	3.44	2.81	1.28
July 10, 1918	4.00	2.25	0.56
January 1, 1919	4.00	2.16	1.08
May 24, 1919	4.80	2.31	0.58
March 15, 1920	Plan discontinued		

Sources: "Ford Motor Company: Statistics: Wages and Hours" dated 10.1.46, Ford Industrial Archive Accession AR-68-26, Box 1, Ford Industrial Archives; "Changes in Cost of Living in the U.S.," 20 Monthly Labor Review (February, 1925), p. 69.

11. The Geneology of Morals

The usual view of welfare capitalism since World War II has been that it was designed to enhance industrial efficiency and to counteract, or preempt, labor unrest. Brandes (1976), the most recent scholarly treatment and the current standard source, catalogues many sorts of activities welfare companies undertook. The impression he conveys is that variety in these activities across companies at any moment in time was more fortuitous than anything else, and that there simply wasn't much variety over time. I shall call this view the homogenist view. Brandes's thesis is that it was not the details but this general enterprise which which had a start, a career, and then an inevitable decline.²⁹⁶ I do not want to offer an opinion on this thesis. But in this section I do want to put some of the previous section's material in context in order to quarrel with the homogenist view.

Brandes is clearly correct to argue that many companies deployed broadly similar programs. But my account of the Sociological Department's work at Ford suggests some skepticism about his view with regard to education. He boldly claims on p. 52 that "within a century [of 1815] American employers would

²⁹⁶See Brody (1980), ch. 2, for a different view on the future it might have had in the absence of the Great Depression.

sponsor every level of education from kindergarden through high school and continuing education."²⁹⁷ But close examination of his footnotes suggests that this needs to be read extremely narrowly. Some finer distinctions are in order, and both a different picture and an analytical story emerge.

The most important distinction is between childrens' and adults' education. Brandes's references mostly cite subsidized public schools. In none of these examples is it clear that enjoyment of the subsidy is restricted by anything other than location of residence. Those examples of which this is not true whose referents can be easily identified concern either (i) classes for adults which were carried out through a public school system, on its premises, with its personnel, and with its own (usually child-oriented) teaching materials,²⁹⁸ (ii) classes on company premises which were organized and conducted by college students or YMCA staff members, (iii) the Ford School, and (iv) "other companies" which "followed" Ford, many of these apparently having done so late in the 'teens and early 'twenties.²⁹⁹

The impression this leaves is that prior to Ford, (some) companies were prepared to subsidize adult education, some even

²⁹⁷ Meyer too (1981), p. 161, suggests that the program at Ford was not distinctive.

²⁹⁸ On the age of the audience for which the lessons had been written, see Davis (1967), p. 50, and, perhaps more authoritatively, Cremin (1961), p. 73. For this sort of thing in Detroit, see Lape (1915).

²⁹⁹ Brandes, op. cit., pp.59-60.

including English classes and Americanization for immigrants, but none thought it worthwhile to control the course content directly or to organize the teaching to emphasize that such good as the teaching bestowed was a gift of the company.³⁰⁰ If Ford innovated first, this was not because Ford had large numbers of immigrants first--the Bureau of Labor Statistics survey makes it clear that this is not so--but because the consequences of this innovation mattered to Ford before it mattered to the other firms. As technologies and production processes changed elsewhere to up the ante, so too would their methods change.³⁰¹

One might hope for any of several distinct sorts of corroboration for this picture. The first would be in the works of contemporary commentaries which survey this and related matters. The second sort lies in the archives and traces of the active companies themselves. The third is in the prehistory of the Ford English School's program in itself.

I first consider the surveys. There are, it develops, three outstanding representatives of this genre: William Tolman's (1905), Ida Tarbell's (1916), and William Leiserson's (1924).

³⁰⁰ The survey of welfare work in Otey (1913), conducted on the even of the five-dollar day and claiming to be broadly based, corroborates this pattern. So does Wheaton (1915).

³⁰¹ For some sense of context, the anonymous article in *The Automobile* for May 7, 1914, p. 959, entitled "Practical Welfare in Motor Factories" does not mention this sort of program. It also casually characterizes the factories whose programs it does study as "machine shops" .

The chapter on education in Tolman's well-known *Social Engineering* discusses the programs of some thirty-one companies. Only two have any sort of English-for-adults, let alone Americanization, classes. The first of these companies is Wannamaker's department store in Philadelphia, a famous welfare firm, which was closely, and I suspect Quakerly, held. "Instruction in English" comes, in Tolman's text, in a list of activities of the Wannamaker's Women's Institute, between "Chorus singing, physical culture, dancing, sewing" and "instruction in German, French, and the mandolin."³⁰² The classes seem to have been strictly for female employees. This does not sound much like Ford.³⁰³ ³⁰⁴ The second is Colorado Fuel and Iron. Here there are elementary schools with a common curriculum, up-to-date facilities, and so forth in all the camps and night schools, so it seems, wherever there are steelworks.³⁰⁵ In these night schools "English, reading, writing, arithmetic, and, in some cases, history and geography are taught."³⁰⁶ If this is a program similar to Ford's, it is certainly going on at the point

³⁰² Tolman, op. cit., p. 273.

³⁰³ I should note that the several pages of Otey (1913) devoted to Wannamaker's activities discuss the Women's Institute and its classes but mention the English classes not at all. Clearly this was not a major program.

³⁰⁴ Those who suspect this really is like Ford after all will speculate that the women in question are sales personnel. A transaction costs argument suggests that these employees are situated with respect to their employer in a structurally comparable comparable position of power.

³⁰⁵ Tolman, op. cit., p. 267.

³⁰⁶ Ibid., p. 260.

in the CF&I production process at which disruptive workers would be the most difficult to cut out and disruption generally most costly.³⁰⁷ But Tolman does not present this information as if much were made of it by the company, and later surveys fail to mention it at all.

Tarbell's *New Ideals in Industry* (1916) can be dealt with more swiftly. She does not think this this sort of work worth mentioning anywhere in her book, not even in a chapter entitled "The Factory as a School".³⁰⁸

Leiserson is more directly helpful. In *Adjusting Immigrant and Industry* (1924), he addresses the point quite specifically. "It was the YMCA which began the work of urging employers to establish classes in English at the place of employment, but the idea appealed to comparatively few employers prior to 1916 [i.e. before the War]."³⁰⁹ Even in 1924,

"A fraction [of the executives interviewed] questioned the responsibilities of industry in this

³⁰⁷ For some sense of how unconstrained the company felt in its mining camps, see any account of the Ludlow Massacre in 1914.
³⁰⁸ Budgett Meakin's (1905) survey does not even go this far: it refers to no such programs whatever.
³⁰⁹ Leiserson (1924), p.120. See also Hill (1919), p. 618, quoting an interview with a man who had recently conducted an extensive survey: "Industrial plants are here and there giving attention specifically to foreign-language workers and, for the most part, they are ready and willing to be used, but [they] do not know how to do the work themselves."

respect. The President and General Manager of a mining corporation wrote: "In our opinion the Americanization of foreign-born employees is not the business of the managers of privately owned industries, excepting in so far as their position as large taxpayers gives them influence with local government or school authorities.

And the policy of a large locomotive works was stated as follows: "Being sited in the heart of a large city with every facility of school and amusement, we have not considered it necessary or advisable to teach our employees English or civics. We cooperate in every way possible with the established institutions in the teaching of these matters, and we have officers who give advice to employees when they need it."

While most employers committed themselves to a policy of "Americanization," few were clear as to the nature of the responsibility in this respect that industry ought to assume, or as to the methods by which an amalgamation of immigrant and native-born workers might be brought about. And there was apparently little realization among them of the relation between the methods of industrial management and the assimilation of immigrants."³¹⁰

The second sort of corroboration is by its nature more equivocal: here corroboration consists in looking for inconsistent evidence and not finding any. My researches to date are only beginning. The only primary materials I have yet obtained are a series of annual reports of the Colorado Fuel and Iron Sociological Department. These make some reference to adult education (along three R's lines) and English-teaching but none to Americanization programs. It is clear there was no standardized course, let alone teaching materials."³¹¹

³¹⁰ Ibid., p. 65.

³¹¹ See Colorado Fuel and Iron (1906-1907), p. 8, and (1907-1908), pp. 22-24.

I would summarize the evidence under the first head, then, as very encouraging for my general hypothesis and that under the second head as consistent with the hypothesis but not, as yet, remotely broadly based enough for the consistency to mean anything in itself. Luckily, the evidence of the third sort is more pointed.

It is possible to trace out the pre-history of the program's tactical ideas through tracing the careers and activities of its authors (who were kind enough to leave considerable traces). This has a character very different from that the homogenist view of welfare capitalism would lead one to expect. This does suggest that the Ford Motor Company was doing something novel, reaching well outside the canon of conventional business practice. It suggests that what we see is not even a confluence of distinct ideas but a conversion, an appropriation. As will become clear below, the extent to which it was not literally true Ford was the innovator is a measure of how very apt the overall hypothesis is.

Ford's classroom materials were written by Peter Roberts. He was Welsh-born and the possessor of a Ph.D. degree, and he first came to public attention through writing a book about the demographic, social, moral, and educational aspects of life in the Pennsylvania anthracite regions. He worked for several years as the director of the industrial department and later the

immigration branch of the Young Men's Christian Association's U.S. national council. In these capacities he had cause to develop various programs for immigrants' socialization.³¹²

The Y.M.C.A. was an evangelical social service organization, whose original organizers had thought to save young London clerks from a life of gin and general urban dissipation through the provision of chapel, hearty Christian fellowship, and large quantities of tea. In the present context the "Y" appears as a religious fellow-traveller of the Settlement Movement, enabling the transplanted peasants from southern and eastern Europe to move safely and successfully in American society (and vice versa).³¹³ While there was certainly a conservative element in this, the political ideology of these movements was radically democratic.³¹⁴ The Unwashed were reminded of their inalienable dignity and claims to respect in the course of teaching them

³¹² For some details, see Roberts (1915). The second and third courses referred to in the first full paragraph of that article's p. 20 appear to be published as Roberts (1912). I am still searching for a complete text to the first course. Roberts (1910) gives no more than hints about its contents. But its hints do convey some information--see especially ch. 2, "The Thirty Lessons and the Equipment".

³¹³ On the Settlement Movement, see Davis (1967). See also Hartmann (1948), esp. pp. 23ff.

³¹⁴ On the conservative element, see, for example, Roberts (1920), p. v. [Later in that text (pp. 225, 228) he writes that "[g]ood citizenship means each one in his sphere, keeping busy, doing honest work and contributing to the sum total of wealth for the support of the nation. ... [O]bedience to authority ... [is among] the prerequisites of good citizenship."] On the democratic, see Davis, op. cit., p. 111 and Addams (1895), pp. 197 and especially 198.

English.³¹⁵ (In settlement houses they learned something about civics too, but it is not so clear they were taught what the Ford workers were on this subject.)³¹⁶ Miss Addams was out of sympathy with the revolutionaries, but one feels confident she would not have had much patience with the Employer's Association and its rhetoric about the moral virtues of the Open Shop, let alone the Ford Company's paternal and unilateralist style in industrial relations.³¹⁷

By the time Americanization had become a widespread enthusiasm in the United States, nativism and the war were much more the motives than (any hint of) technical change.³¹⁸ Not much of the relevant sort of technical change had happened yet on any scale. Recall the quotations from Leiserson and Hill quoted above: the industrial companies which were now involved were acting out of patriotism, not profit-maximization. It was not until the idea of the American became firmly connected to that of the open shop, in the American Plan, that business developed any widespread interest in this sort of activity.³¹⁹

³¹⁵ This was the doctrine of 'immigrant gifts' and the notion of offering a home rather than changing them (as the nativists wanted). See Korman, *op. cit.*, p. 138, or Higham (1985), e.g., pp. 204-217.

³¹⁶ Davis, *op. cit.*, p. 88.

³¹⁷ See the quotation in Tims (1961), p. 69.

³¹⁸ On the nativist strain, see Higham (1985), especially 158-263.

³¹⁹ Bernstein (1960), pp. 88, 147. By that time, one found an opening address to a National Conference on Americanization in Industry summarizing "the fundamental priorities of American life" as "a sound social order". See Quimby (1919), p. 5.

The one exception to this pattern that I have turned up is an exception that proves the rule. I have identified one other company which, prior to the Ford program, engaged in this sort of education. (They employed Peter Roberts's materials to do it; and he seems to have made available essentially the same teaching materials in Dearborn.)³²⁰ This company was the International Harvester Company.³²¹ Students of the history of technology will immediately recognize the company: it was formed from components which included the McCormick Reaper Works.³²² I have not yet explored the technological history of the International Harvester plants in anything like the detail I have studied Ford. But it is clear that in this period International Harvester had brought the American system of production to an extremely advanced state in some of its factories and was self-consciously on the edge of Ford-like methods. The men who voted 'yes' after the Chicago "Y" made the Peter Roberts pitch understood about keeping fixed capital utilized. Their imperatives were qualitatively the same as Ford's. It is hardly surprising that they acted in the same way.

³²⁰ Korman, op. cit., p. 147; personal inspection of lesson sheets in Ford Archives Small Accession File No. 1544.

³²¹ Korman, op. cit., p. 143.

³²² See Ozanne (1967), p. 45, and Hounshell, op. cit., pp. 153-187.

12. Analytical Conclusions

Five dollars a day was not a market-clearing wage level. It was indeed plausibly an example of the phenomenon efficiency wage theory tries to explain: supra-competitive wages set by profit-maximizing firms and excess supply of labor efficiency wage theories--turnover costs, adverse selection, and moral hazard in isolated individuals--seem unlikely to have been the central motive force in this episode.

An imperfectly competitive version of the moral hazard approach seems more cogent. This explanation amounts to a fancy version of shirking by those with some market power in the supply of useful labor. Such a rent-sharing theory may be seen as a species of the strike-threat and could also pass for one of the several interpretations of the insider-outsider approach. For this sort of explanation to make sense, the Ford Motor Company would have to have had a certain sort of production process and the owners and managers of the company would have to have had a certain set of beliefs and fears. For these to have been sensible beliefs and fears, it would have to have been true that the actual and prospective Ford workforce had a second rather particular set of beliefs and susceptibilities. But all of these assumptions prove to be quite defensible. So there is an efficiency wage story to tell here, just not one of the usual ones. Perhaps more interestingly, it must be one in which there

can be changes in workers--in each worker--as well as in compensation if it is to fit the five-dollar day's later history.

The Ford Motor Company adopted the wage and personnel policies it did in isolation. This owes to the fact that its production process, which induced its labor demand, and its labor force pool, from which it drew its labor supply, were unusual with respect to other superficially analogous firms. *Ceteris paribus* one would expect other profit-maximizing firms to adopt similar policies only when they adopted similar and similarly situated production processes. One would expect the Ford Company to continue only as these circumstances remained substantially unchanged. I discuss very briefly the question of whether other things did remain equal in the Epilogue which follows.

None of this establishes as an empirical fact that Henry Ford had no non-economic motives. I claim only that the motive of maximizing profits would have sufficed. This defends the neoclassical picture of the manager. It does so at the expense of the neoclassical picture of how he goes about making up his mind. It does this by explicitly making history an adjunct to, as well as a subject of, analysis. I argue in Appendix III that for this sort of subject--loosely, effort supply and the internal organization of firms--it was never sensible to conceive matters any other way.

As to macroeconomic themes, all this can only make the hysteresis approach seem more intriguing. The study's contribution to the debate on the present relevance of the canonical efficiency wage theories must be limited. But there is some force in the observation that the Ford Motor Company, with its workforce overwhelmingly occupied with production and its production jobs extraordinarily routinized, has emerged as a very unlikely place to expect to find individual shirking. In late 1980's America, even most production jobs appear less easily monitored, and one's instinct is that most jobs in the economy are either in the service sector or otherwise involve more individual discretion still.²² That is promising ground for moral hazard of either variety.

²² In 1980, only 22 percent of the total employed civilian labor force were operators, fabricators, or laborers. Precision production, craft, and repair jobs accounted for 14 percent, services for 13 percent, technical, sales, and administrative support for 29 percent, and managerial and professional for 18.5. (See U.S. Bureau of the Census (1985), p. 400.) Monitoring and control must be relatively more difficult in all these categories.

13. Epilogue

Large-scale immigration stopped with the War.³²⁴ The Wobblies were suppressed in September of 1917.³²⁵ Sam Gompers received Wilson's suit for industrial peace the following November and accepted the legitimation Wilson proffered in exchange for his own good offices.³²⁶ It is unclear what those offices were worth: the labor troubles of the late teens seem to have been craft-oriented.³²⁷

³²⁴ Net immigration from all places in 1913 was 815,303. The annual average over 1915-1918 i.e. the great bulk of the War was 66,861. See U.S. Bureau of Immigration Annual Reports 1913-1918.

³²⁵ Preston (1963) is the standard source. But for present purposes it is at best a rather indirect treatment. The same may be said of Perlman and Taft, op. cit. (where the relevant material is on pp. 412ff). Higham, op. cit., pp. 227-233, gets closer, but only a little. Perhaps the long-rumored Montgomery (forthcoming) will give more insight into what this actually meant to working men.

³²⁶ See Kennedy (1980), ch. 2 passim.

³²⁷ Montgomery, op. cit., p. 98. For some Detroit evidence, see "Government Analysis of Labor: Detroit Situation Reaches Acute Stage: Shortage Will Reach 35,000 Men," 38 *Automotive Industries* (April 25, 1918), p. 841, and "Detroit Union Workers Demand 44 Hour Week: Formal Demonstration to Claim Wage Increase: Growth of Organized Labor," 40 *Automotive Industries* (May 1, 1919), p. 972. There were skirmishes in "the big auto concerns," but the firms always settled (for higher wages) within a few hours and the men went brickly "back on the job." See "Detroit Now Faces Labor Shortages," 40 *Automotive Industries* (May 8, 1919), p. 1028.

After the War the old gifts were no longer so highly valued.³²⁸ When the Ford Motor Company worried next about labor, other control technologies seemed less expensive. The company did very tentatively reach out to the one group which might have shared the earlier susceptibility--blacks come up to Detroit from the South, living in the city's most extreme poverty and scarcely citizens of the political nation.³²⁹ But the company did not then pursue the idea with any vigor. Other ways seemed easier.

When the course of the diffusion of Ford's production process and the evolution of compensation schemes elsewhere in the industry in the 'teens and 'twenties has been more thoroughly mapped out, there may be a further interesting story to tell.³³⁰ Certainly there is evidence of other auto firms employing complex and otherwise interesting compensation schemes. The question is whether compensation practice co-evolved in a systematic way with production technology (and with anything else). I am currently engaged in digging out and collating the relevant facts. Considerable digging is required. As of this writing, key facts remain unpublished, an intriguing but largely undiscovered country.

³²⁸ Of this period--of 1919 in particular-- Leiserson even commented (op. cit., pp. 73-74) that roles had become reversed: the immigrants formed craft unions and staged control strikes, while the native-born were willing to cut wages.

³²⁹ Meier and Rudwick (1979), pp. 9-10; Zunz, op. cit., ch. 14 *passim*.

³³⁰ See also the closing paragraph to Appendix III below.

Appendix I:

The text of the announcement

The Ford Motor Company, the greatest and most successful auto manufacturing company in the world, will on January 12 inaugurate the greatest revolution in the matter of rewards for its workers ever known to the industrial world.

At one stroke it will reduce the hours of labor from nine to eight, and add to every man's pay a share in the profits of the house. The smallest amount to be received by any man twenty-two years old and upward will be \$5 per day. The minimum wage is now \$2.34 per day of nine hours.

All but ten per cent of the employees will at once share in the profits. Only 10 percent of the men now employed are under 22 and every one of those under 22 will have a chance of showing himself entitled to \$5 per day.

Instead of waiting until the end of the year to make a distribution of profits among the employees in one lump bonus sum, Mr. Ford and Mr. Couzens have estimated the year's prospective business and have decided upon what they feel will be a safe amount to award the workers. This will be spread over the whole year and paid on the regular semi-monthly paydays.

The factory is now working two shifts of nine hours each. This will be changed to three shifts of eight hours each. The number employed is now about 15,000 and this will be increased by 4,000 or 5,000. The men who now earn \$2.34 per day of nine hours will get at least \$5 per day of eight hours.

This will apply to every man of 22 years of age or upward without regard to the nature of his employment. In order that the young man from 18 to 22 year of age may be entitled to a share in the profits he must show himself sober, saving, steady, and industrious and must satisfy the superintendent and staff that his money will not be wasted in riotous living.

Young men who are supporting families, widowed mothers, or younger brothers and sisters will be treated like those over 22.

It is estimated that over \$10,000,000 will thus be distributed over and above the regular wages of the men.

Appendix II

Text of "Ford Plant Is Beseiged," Detroit Free Press, October 2,
1913

Pushing and pulling, over 5,000 men fought for hours Wednesday morning [i.e. October 1] to reach the employment office of the Ford Motor Company, Highland Park, in an attempt to regain the positions from which they had been dismissed, Saturday noon, when the plant closed for inventory.

With the first rays of light Wednesday morning men began to assemble outside the employment office. In an hour the street was blocked completely and at 7 o'clock, when the day shift was supposed to begin its work, Manchester Avenue was choked for blocks.

As soon as the employment office was opened, a wild rush ensued.

Fighting developed and a call was sent to the village police headquarters. Nine patrolmen responded. The officers had great difficulty in restoring order. Men were compelled to fall into line. As the crowd diminished, the men became more orderly and before 1 o'clock the last of the 5,000 men had been admitted to the office.

When the plant closed for inventory last Saturday most of the foreign laborers and mechanics were paid and discharged. They were informed at that time that they would probably be rehired when the plant opened.

Appendix III:

Method in economic history and its relation to the logic of choice

The Old Economic History told stories, so it is said, about heroes and villains and about the rise and decline of institutions and nations. The method was inductive, the rhetorical vehicles the narrative and the global comparison. The New Economic History instead proposed (neoclassical) models and statistical hypothesis testing. At its best, the Young Turks said, the Old might conceivably produce insight. The New produced knowledge.

The New Economic History has for the most part concerned itself with price-theoretic issues and attempted to test its hypotheses on large samples. The demand and supply behavior are thus those of aggregates. This is at best macro micro-economics. The assumption in the background must be that the various agents do not view the choices before them in significantly different ways. The agents' different actual choices thus stand in for the representative agent's hypothetically simultaneous as-if choices.

Historians might equally be interested in micro micro-economics, that is, supply, demand, and efficient organization with relatively small groups of agents. Crudely, the difference between supplying effort within a firm and to a market is that in the former case parties with whom one expects to have ongoing relations will bear the burden of one's opportunistic behavior (and vice versa). When numbers are small, of course, the plausibility of the usual assumptions that action can be anonymous melts away. So individuals' actions will bear some meaning to those who burdens or welfare depends, in some respect or other, upon them, and so will bear meaning to the actor. Choices will be, so to speak, meaning-laden.

In this sort of setting, a description of the action alone will not suffice to describe the object of (economists' 'rational') choice. Philosophers find it useful to distinguish contexts in which co-referential terms may be freely substituted for one another (extensional contexts) from those without free substitution (intensional contexts).²⁶⁷ The labor- (i.e.

²⁶⁷ The modern locus classicus for this distinction is Quine (1960), ch. 2. It originates in the writings of Frege. (See Dummett (1981), pp. 89ff.) For a relatively introductory discussion, see Blackburn (1984), pp. 281-293.

effort-)supply decision in a non-anonymous setting is a good example of an intensional context.²⁶⁸ Yet the logic which took economists from particular choice acts to a utility function defined over the argument-space of an set of unambiguous goods-or-effort-objects was an extensional one. These choice objects are not always unambiguous. When they are not, their description as such will be incomplete. The problem with these potentially intransitive preferences thus is not the existence of an equilibrium.²⁶⁹ It is multiplicity of characterizations of the agents.²⁷⁰

This says that a behavioral approach will be quite inadequate to summarize, let alone to understand, choice behavior in any comprehensive way.²⁷¹ In some settings agents' understandings--their beliefs and their attitudes along with their preferences--will necessarily be part of the subject of study. Effort supply (and so motivation schemes) in formal organizations is an example.²⁷² Effort supply in formal organizations in which the terms of participation are undergoing radical change is a particularly salient example.

This is the more interesting when one considers that 'technology' and 'machines' are not synonyms. The production process-- $f(E(L),K)$, say--is clearly very incompletely described as $f(L) + g(K)$. The factors are usually co-operant. Reliable analytic history of technical change and diffusion, not to speak of the history of the profit-maximizing adjustment of organizational institutions, schemes of compensation and motivation, and the like, must consider the choice behavior of actors as they would actually make choices. Useful (rather than merely picturesque) labor history, at least since Thompson powerful (1963), certainly needs the economist's perspective. But economic (and business) history equally needs labor history, even the picturesque variety. The present study is intended to illustrate the practice, and some fruits, of interaction.

It may be worthwhile to make one other connection explicit. Transactions costs as economists usually conceive them are not

²⁶⁸ This is the point of Solow (1980).

²⁶⁹ In any case, we know from Katzner (1971) and, more cryptically, Sonnenschein (1971), that strict transitivity is not required for existence.

²⁷⁰ More precisely, of the bases on which they make their choices.

²⁷¹ Here see also Charles Taylor (1971).

²⁷² Solow (1980) raised the question of whether labor 'markets' are more like this than like the markets of general equilibrium theory. It is a good question.

primitive conditions. They are consequences of other states of affairs. One might divide transactions costs into the costs of finding executants, the costs of coming to an agreement with them as to what is to be done and on what terms, the costs of monitoring what in fact was done, and the costs of enforcing the bargain ex post. Williamson isolates some structural determinants of these given the usual neoclassical picture of individual motivation, and he leaves the impression that given these determinants the structure of transactions costs is fixed, a fact of nature.²⁷³ But the nature in question is human nature, and it is not at all apparent that the neoclassical abstraction sheds as much light here--analyzing the internal organization of firms--as it undoubtedly does elsewhere. The arguments which persuade us to expect firms to maximize profits have much less force in aid of individuals maximizing a monadic sort of utility. There is no reason to believe that alternative sets of beliefs about acts' context i.e. about other agents' beliefs are not sustainable. So the structure of transactions costs is only determinate given a description of agents' beliefs about the meaning of the relevant acts. These beliefs might be summarized in the phrases 'ideals of individual autonomy' and 'images of collective identity'. The character of these sorts of beliefs which the members of a small group of intelligible collective enterprise hold matters for the details of efficient internal organization.²⁷⁴

Competition in product markets enforces nothing more than of firms' internal organization than that they yield up the output as cheaply as any other firm. So it is not true even that the existence of a single most efficient set of organizational institutions for any given set of transactions costs means that all firms in the market will be organized in the same way. Different firms may see fit to make different cultures. To the extent they really do this, they will face different sets of costs.²⁷⁵ Efficiency given alternative structures of transactions costs might thus lead to different but ultimately equally efficient internal organizational structures. Put a little less abstractly, an important purpose of organizational institutions is to keep intra-firm warfare and pillage within

²⁷³ Williamson (1985), ch. 2.

²⁷⁴ I discuss these matters in more detail in Raff (1985) and (1986c). For an example of historical analysis, see Raff (1986a), Section 9. See Dow (1985) for an apparently different, but arguably derivative sort of indeterminacy.

²⁷⁵ There is good reason to think that in the world there is real scope to do this. For this point in an actual competitive context, see Raff (1986c), a study for a series of Harvard Business School cases.

tolerable limits. The scope of the problem and the nature of optimal solutions will depend on the ideals of individual autonomy and images of collective identity the actors bring to their collective enterprise.²⁷⁶ Morale, pace Lindbeck and Snower (1984), thus has far deeper consequences than modelling it as a labor-enhancing shift parameter would suggest. Technology (for production and for processing information) and relative factor prices do not tell the whole of the tale of efficient production.

This raises a practical point. Suppose management is prepared to spend to buy loyalty. This would certainly change the structure of the costs. But it is still not apparent that in all demand conditions the Fordist strategy--using the loyalty to support (the disutility of) a highly integrated production process but placing notably small demands on individual firm-specific human capital--is the optimal one. There is good reason to suspect that when Chevrolet broke Ford's dominance of its market, it relied on mobilizing a base of more discretionary, and so less easily routinized, skills in important parts (if not the majority) of its workforce than Ford Motor Company chose to cultivate. Ford's problem, that is, was not just an aging and excessively familiar design. The company's problems reached down much farther into the production process. Mixed industry equilibria with efficient operations everywhere might be possible.²⁷⁷ ²⁷⁸ But it might also be true that some combinations of transactions cost structures, work design and control structure, and production strategy are simply less

²⁷⁶ One could also imagine holding these constant, changing the technology, and comparing efficient motivation schemes. Susan Rose-Ackerman suggested, during a seminar presentation of this material, an ingenious candidate comparison. I hope to say something about it in the final version of Raff (1987b).

²⁷⁷ This says that that it makes little sense to study the inter-industry wage structure in search of confirmation of, e.g., some particular efficiency wage theory, without controlling for the characteristics of the production processes by which the firms comprising any industry make the products which earn them the distributable surplus. Intra-industry samples may well have a more illuminating story to tell. I will report on some preliminary research concerning the automobile industry during decade following the period discussed in this manuscript in the course of Raff (1987b).

²⁷⁸ Whether or not Chevrolet and Ford in the mid-1920's is a good example of this, the early history of Toyota suggests that such an alternative would have been viable given the extant technology. (For a cue, see Cusamano, p. 268. For some details, see Sugimori et al. For some of the supporting facts, see Friedman, p. 362.)

efficient than they might be.²⁷⁹ Perhaps Ford acquired an asset which it did not systematically exploit.

There is a related question, which might be more easily researched. A management which did not need to buy loyalty, say due to quite different conditions in its ambient labor markets and in the minds of the actors in its factories, might have been able to make Ford's transition in technique with a low-wage strategy. It would be interesting to study the coming of the line to European (and, indeed, Japanese) manufacturing and the pay and personnel policies which accompanied it from the perspective of this Appendix.²⁸⁰ It seems to have worked out in two distinctly different fashions outside Highland Park.²⁸¹ I wonder how much light one can shed on why this was.

²⁷⁹ On what Chevrolet did, see Hounshell, pp. 263-301. Chandler (1962) is, of course, also germane. There is to my knowledge no useful empirical research on the skill demands of Sloan's strategy in this. I would like to do some sometime.

²⁸⁰ Fridenson's bibliography will be helpful here.

²⁸¹ See Cusamano, op. cit., and Lewchuk, op. cit.

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Motor World

New York Call

New York Sun

New York Times

Pittsburgh Sun

Wall Street Journal

Waterloo (Iowa) Times Tribune

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Daniel Raff was born on September 23, 1951 in Washington, D.C. He was educated at the Friends School at Sandy Spring, Maryland, and at New College. He did graduate work at Princeton University, Merton and Nuffield Colleges in the University of Oxford, and at the Massachusetts Institute of Technology.

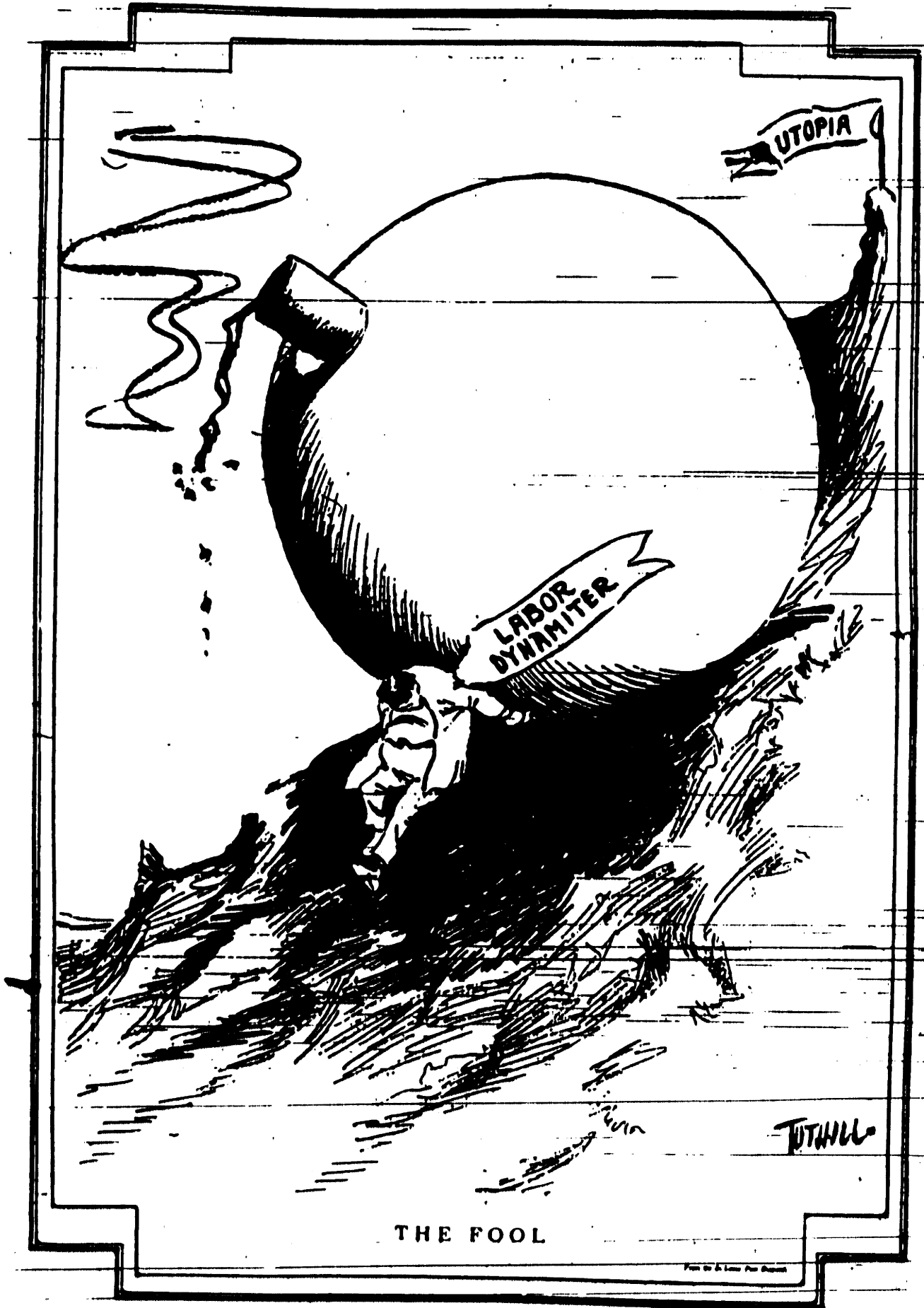
He was Visiting Lecturer in Economics at Brasenose College, Oxford for Trinity Term, 1982, and taught economics and economic history as Lecturer in Economics at Magdalen College, Oxford from 1983 to 1985. He taught economic history in Harvard College in the spring term of 1987 during his tenure of a Research Associate post at the Harvard Business School. On July 1, 1987, he takes up an Assistant Professorship at the Business School.

He married Susan Adelman in Cambridge on May 18, 1986. Their unbearably adorable daughter Anna Amelia was born the following January.

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