

Brassey's Law and the Economy of High Wages in Nineteenth-Century Economics

Ray Petridis

History of Political Economy
vol. 28, n°4, 1996

History of
Political
Economy

VOLUME 28
NUMBER 4
WINTER 1996

The wages of labour are the encouragement of industry, which, like every other human quality, improves in proportion to the encouragement it receives. Where wages are high, accordingly we shall always find the workmen more active, diligent and expeditious than where they are low.—Adam Smith, *Wealth of Nations*

Recently the search by economists for a satisfactory explanation of cyclical variations in involuntary unemployment has returned to analyses of the dependence of labor productivity on the real wage. These so-called efficiency-wage hypotheses suggest that it would be rational for profit-maximizing firms to pay their workers real wages in excess of the market-clearing wage in order to minimize labor cost per efficiency unit. There are a variety of channels through which higher real wages may influence productivity, and, consequently, a plethora of efficiency-wage models have been developed. Some of these models have direct antecedents, especially in the internal labor market literature of labor economics and in earlier attempts to explain wage rigidity in macroeconomics (Akerlof and Yellen 1986; Katz 1986).

In the contemporary literature, the origins of the efficiency-wage hypothesis are rarely traced back beyond the well-known contribution in development economics by Harvey Leibenstein (1957). This article accepts that the dominant conceptual idea in such theories is the existence of a causal link between real wages and productivity of labor. There is no presumption that the writings of earlier economists precisely anticipated contemporary efficiency-wage theories. In particular, earlier writers did not possess the theoretical apparatus relating to involuntary unemployment and a less than full-employment equilibrium, although this article will show that some of them linked together higher wages, increases in productivity of labor, and increased unemployment.

The connection between high wages and the productivity of labor seems to have been recognized by writers down through the ages. I demonstrate below that, based on their business experience, "practical" economists (the amateurs) strongly subscribed to such views. Some professional British and American economists were undoubtedly influenced by these amateurs and espoused similar views with varying degrees of rigor. It will be seen that in the period spanning the marginal revolution, the concept of higher wages leading to increased labor productivity posed some analytical problems for professionals theorizing about equilibrium.

This article is organized around the idea of Brassey's Law in order to emphasize the influence of amateurs on the analysis by the professionals of wages and productivity in the nineteenth century. The term was named after Lord Thomas Brassey, who described how in widely different geographic, social, political, and economic circumstances workers produced approximately the same amount of output per wage unit, regardless of the actual wage. It was amateur economists, industrialists, and outside observers who liberally interpreted Brassey's Law to produce the generalization that higher real wages may cause increased labor productivity. Their discussion was based on the observation that higher real wages improve the physical condition of the laborer, an idea which has been labeled "the nutrition model" in recent theoretical literature on economic development (Dasgupta and Roy 1986, 1987; Bliss and Stern 1978). Despite the nonrigorous and rudimentary nature of the amateurs' analyses, their views played a major role in the discussion of the time and so had a significant impact on the analyses developed by professional economists.

Section I provides the background to the late-nineteenth-century discussions on wages and productivity, starting with a brief examination

of earlier views on the issue, followed by the influential contribution of an amateur writing about the situation in Ireland in the mid-nineteenth century. The views of the two most influential amateurs, Brassey and Jacob Schoenhof, are examined in section II. In section III, the reactions and extensions to this analysis by J. E. Cairnes and F. A. Walker provide an early link to the marginal economists and demonstrate the impact of the amateurs on the views of the professionals. Section IV is devoted entirely to Alfred Marshall's analysis of wages, the standard of comfort, and the efficiency of labor; it emphasizes his more rigorous approach as well as illustrates the tensions that it caused with regard to his marginal theory of distribution. Section V sets out the contribution of John A. Hobson, who played a role somewhere between amateur and professional. Hobson produced a balanced evaluation of the amateurs' views and provided the most insightful exposition of how increases in wages engender increases in the productivity of labor.

I

The link between wages and productivity attracted the attention of writers long before the nineteenth century. In his excellent early study of changing attitudes toward labor and in several related articles, A. W. Coats (1958, 1971, 1992) demonstrates that in the earlier part of the eighteenth century among British economists there was a "growing appreciation that high money wages did not necessarily mean high labour costs" (1992, 72). High wages and increased productivity were therefore linked together. In these discussions it was common to examine relative wages in Britain and other European countries and relate this to the relative efficiency of labor. The classical economists made similar comparisons and invariably drew a contrast between British workers and their Irish counterparts (Coats 1971, 157). Similar themes recurred during this period, although the role of the amateurs as a catalyst to the discussions of the professionals was of greater importance.

In the mid-nineteenth century, comparisons were again drawn between the relative efficiency of labor in different countries and between different regions of the same country. Most emphasis was placed on levels of nutrition, and pre- and post-famine Ireland was the most discussed country. Ireland drew attention because of the widespread view that wages were lower there than in most other European countries. An especially important and widely noted contribution to the discussion was made by Robert

Kane (1845).¹ He noted that, although the daily wage rate in Ireland was very low (compared to Britain), a large proportion of the Irish labor force was unemployed for much of the year. Kane stressed a theme that was to be expressed repeatedly in subsequent economic analysis: "Nominal cheapness [of labor] is, however, by no means necessarily economy in final cost" (1845, 397). According to Kane, the Irish laborer who was paid lower wages than his British counterpart was so physically and psychologically depressed that his daily output was also depressed. The British worker might be paid double the Irish worker, but his output was so much greater that ultimately the unit cost of his labor was not higher. Supervision (overseeing) costs were also reduced. Kane provided specific examples demonstrating that when Irish workers were paid higher wages, their output increased more than proportionately. Data on the relative efficiency of British and French foundry workers also supported his conclusion that "wages ceased to be low precisely as the efficiency of work increased. The cheapness of labour is thus shown to be quite different from the nominal rate of wages" (1845, 399).

Knowledge of the Irish situation did not lead contemporary economists to attempt to develop theoretical structures consonant with the observed facts. John Stuart Mill seemed to accept the relationship between wages and efficiency uncritically, observing in passing in his *Principles* that "With the rate of wages such as it is in Ireland, or in England (where, in proportion to its efficiency, labour is quite as cheap as in Ireland). . . ." ([1871] 1965, 249). Mill does not provide a source for this view, but given his deep interest in Irish affairs it reflects an intimate knowledge of the condition of the Irish economy.² Nothing is made of this in Mill's discussion of wages,³ his main interest being the related problem of the impact of the cottier system (the use of land as a payment for labor) on Irish agricultural labor. Such low wages (or high rents) adversely

1. Kane produced a remarkably insightful piece of inductive analysis examining Ireland's natural resource base, the characteristics of agriculture, transport, and the organization and economic analysis of labor and capital. Kane, who was a medical practitioner, delivered the lectures to the Royal Dublin Society, and the lectures were published at the Society's behest.

2. At the time when he was writing the *Principles*, Mill contributed forty-three leading articles dealing with Irish affairs to the *Morning Chronicle* (Mill [1871] 1965, lxv).

3. Although in his discussion of the determination of profits he again notes, "the cost of labour is frequently at its highest where wages are lowest," attributing this to differences in efficiency which, he wrote "is proved . . . by abundant testimony" but is not documented by Mill ([1871] 1965, 413-14).

affect the efficiency of labor and also their motivation to improve that efficiency. Mill wished to see the cottier system abolished but stopped short of advocating an increase in wages as a means of increasing the efficiency of agricultural laborers. Elsewhere, in discussing the probable future of the laboring classes, Mill notes with approval the profit-sharing experiment instituted in Paris by a house painter in the 1830s. The painter, M. Leclair, offered his workers higher wages. In this way he succeeded in recruiting "excellent workmen" (Mill [1871] 1965, 771) who showed greater loyalty to his establishment. Supervision of their work remained a problem until their annual incomes were increased yet further by an end-of-year profit-sharing arrangement. Clearly, Mill accepted that aspects of the efficiency of labor might be improved by higher wages (in addition to improvements due to better physical conditions), but he thought that such improvements would be associated with greater cooperation between capitalists and laborers.⁴ Profit sharing and cooperative production were the ultimate objectives "if mankind continued to improve" (Mill [1871] 1965, 775). Unfortunately, despite some experiments in Britain, these developments lay in the future, although "in perhaps a less remote future than may be supposed" (Mill [1871] 1965, 793).

II

In the lacuna between the publication of Mill's *Principles* and the emergence of the marginal economists, apart from the wages-fund issue, scant attention was paid by economists to the relation between wages and efficiency. But in the rapidly industrializing British economy in the second half of the nineteenth century some "practical men of business" observed an unusual phenomenon. As they paid their workers higher wages, a more than proportionate increase in output per worker seemed to be elicited. The most important observer of this phenomenon was Thomas Brassey (b. 1805–d. 1870), railway contractor to the world, whose observations and experiences were recorded and published by his son, Thomas Brassey (later Earl Brassey), over a fifty-year span (Brassey 1872; Helps 1872; Higgs 1926).

4. William Thornton discusses Mill's interpretation of the Leclair practices and adds some examples of his own, but his emphasis was on profit sharing, although he insightfully suggests that employers "are acting upon a principle . . . that labourers may, by the conditional promise of extra remuneration, be stimulated to extra exertion and attention" (Thornton 1870, 389; see also 364–65, 373, 378, and 391–92).

While managing a highly profitable construction business through excellent, if slightly paternalistic, relations with his employees, Brassey noticed a strong, positive relationship between his workers' pay and their productivity. His interest stimulated and his Victorian zeal aroused, Brassey began to conduct interviews with employees, managers, and secretaries on the relation between their work and wages, supplementing the information with some data from other employers. In all, he compiled twenty-four volumes of interviews covering manufacturing, textiles, and railway and building construction in Britain, Ireland, Germany, France, and India. The results of this research were first published by Brassey's son in 1872 under the title *Work and Wages*.⁵

From these data and observations a number of major, but not entirely consistent, messages emerged. The central idea was the enunciation of Brassey's Law. This was the claimed tendency for output per wage unit to be the same everywhere. Brassey regarded this as an impressive proposition with which he wished to persuade other employers to follow his wage policies. As will be seen below, the proposition was easily open to challenge on logical grounds, although since Brassey was working with relatively homogeneous, unskilled labor, one of the obvious defects of the analysis was less visible.

In making his case for industrialists to pay higher wages, Brassey fudged the distinction between the generalization of Brassey's Law and the specific propositions associated with the economy of high wages. Thus he argued that the payment of high wages did not preclude the firm from making large profits because the higher wages would be accompanied by increased investment, improved management, and, of course, increased work effort from labor. Even the efficiency of unskilled labor increased with increased wages as workers responded to improved nutrition, which also led to an increased ability on the part of the workers to benefit from training. Comparing railway workers in England and India, Brassey noted that there was an additional reason for the increased efficiency of the English worker—the low cost of supervision when compared to his Indian counterpart. Reducing hours of work sometimes increased output per worker in the same way as an increase in wages.

5. Some of the material in this book is also referred to in Helps 1872, cited above, and in *Lectures on the Labour Question* (Brassey 1878). The book was reissued with a new preface in 1916 in response to "a few friends, fellow members of the Political Economy Club," who thought that it would be "useful for the guidance of all who have to deal with the management of labour" (Brassey 1916, viii).

When he built the Trent Valley railway, Brassey adopted an eight-hour day (down from the usual ten-hour day) and used double shifts. The result was an increase in output per worker, which comfortably compensated for the reduction in hours. This led to the argument that neither the rate of wages nor the number of hours worked per day was a true measure of the cost of labor. He expressed the point in this way: "daily wages affords no real measure of the actual cost of work; and it is quite possible that work may be more cheaply executed by the same workmen, notwithstanding that their wages have largely increased" (Brassey 1872, 67).

Brassey's book was favorably received in his small, liberal intellectual circle. Favorable reviews appeared in the major periodicals, the *Quarterly Review* (1873), the *Edinburgh Review* (1872), and the *Fortnightly Review* (1872). The last was written by Frederic Harrison and was an extensive review quoting detailed data from a variety of sources and heaping fulsome praise on Brassey's ideas and practices. The distinction between Brassey's Law and the economy of high wages was ignored by Harrison, whose major objective was to promote higher wages and reduced hours of work while also mounting an attack on capital. To this end, he poured vitriol on the economics profession. "Political economy professes to be a science based on observation. But the bitter pedantry which often usurps that name usually assumes its facts, after it has rounded off dogmas to suit its clients" (Harrison 1872, 268). Apart from J. E. Cairnes (see below), the response from mainstream economists was muted.⁶ Outside the mainstream, popular commentators and some industrialists focused on what came to be regarded as the central message—and which has been termed Brassey's Law of wages and productivity.⁷ "On my father's extensive contracts, carried on in almost every country of the civilised world, . . . the daily wage of labour was fixed at widely different rates; but it was found to be the almost invariable rule that the cost of labour was the same in *that for the same sum of money, the same amount of work was everywhere performed*" (Brassey 1872, 75; emphasis added). It was more comfortable and convenient to take from this argument the message that relative rates of productivity varied across countries in proportion to

6. Many years later, F. Y. Edgeworth quoted Brassey's results approvingly but suggested that Harrison's "interpretation of the facts stated by Lord Brassey is remarkable" (Higgs 1926, 176), which Edgeworth intended to be taken as dissent from Harrison's vituperative comments (see also Edgeworth 1894).

7. For example, see Howell 1878, which says that "Mr. Brassey has conclusively shown that high wages do not necessarily mean costly production" (408; see also Gilman 1904).

the rate of wages paid. In the latter half of the nineteenth century it was easy to demonstrate both that British workers were paid more than their counterparts in Europe and that they were correspondingly more efficient (see Mundella 1878; Jeans 1884; Chapman 1904). The comparison with the United States differed because U.S. wages outstripped British wages, but the productivity data suggested that British and American rates were similar.

In the United States amateur economist Jacob Schoenhof (b. 1839–d. 1903) began to extol the virtues of high wages. For a time, Schoenhof served as U.S. consul to England (Higgs 1926, 753) and carried out a number of investigations of training, education, and working conditions in Europe on behalf of Thomas Bayard, U.S. secretary of state. Bayard and Schoenhof favored the lowering of the U.S. tariff, and the material gathered by Schoenhof was designed to demonstrate the economic benefits of reduced protection.

By 1885, Schoenhof's ideas crystallized in his book on the industrial situation. In that book he focused mainly on liberalizing the labor market and reducing tariffs, reaching the conclusion at the end that "our labor, assisted by machinery, is so efficient and cheap now, that with free materials we could advance our labor price, and still be able to undersell European labor in any of the neutral markets of the world" (156). He opposed cutting wages in order to meet foreign competition, and rather favored the reverse, supporting his argument with copious comparative labor cost and output data for the United States, England, Germany, and France. He concluded that "countries whose productiveness of labor has attained the highest potency, are those whose earnings and wages are highest, and that, inversely, low wages and low productiveness go hand in hand" (1885, 17). The causal mechanism according to Schoenhof was from high wages to a high standard of living. Improvements in nutrition and the ability to spend income on ancillary goods and services were a direct result of the payment of higher wages. In a most telling example, Schoenhof compared data for Germany in the fifteenth and seventeenth centuries, concluding that both wages and productivity were higher in the earlier period.

There was some opposition to Schoenhof's free-trade-high wage-prescription, and Schoenhof was removed from his position in the U.S. Consular service.⁸ Undeterred, Schoenhof continued his research and in

8. See the introduction to Schoenhof (1928, iv) by T. F. Bayard, formerly secretary of state in the Democratic administration. Thirty years later, the Hoover new era administration supported high-wage policies, as did some industrialists such as Henry Ford (see Austin and Lloyd 1926;

1892 published his book with the felicitous title *The Economy of High Wages*. He quotes Brassey on work and wages approvingly and pursues the theme raised in his own earlier work with fresh data and even greater vigor. He argues that high wages are not only associated with increased efficiency of labor but also with a number of other important benefits. Employers can recruit and, more importantly, retain the most skilled labor so that the specific on-the-job training provided is not lost to the firms (26–27). He also argues from his own experience in the clothing trade that high wages improved the attitude of the workers leading to improved efficiency (393–94). Other elements of his argument point to an increased incentive for capital-labor substitution and improvements in organization and management. Finally, higher wages lead to a rise in consumption and increased demand since wage earners are numerically the largest class.

Like Brassey, Schoenhof's views might be classified as those of an enlightened, somewhat paternalistic, and radical conservative. The analyses of both men relied on what F. Y. Edgeworth called "the inductive parts of political economy" (1894, 688), so their collection, arrangement, and use of data supplemented by long and detailed anecdotal evidence was easily open to challenge. Both also took a strong polemical stance, with Schoenhof in particular presenting a powerful and, at times, biased case for the pursuit of free trade. One line of attack was for academic economists to question the data and the bias of the authors. But if any validity was conceded to their inductive analysis, the challenge still remained of demonstrating how the academic theoretical models could explain the data.

III

Among British economists one of the strongest early reactions to Brassey's book *Work and Wages* came from J. E. Cairnes, an economist who, despite the early developments in marginal analysis, remained very much in the pre-neoclassical, historical mold. Cairnes wielded considerable authority, especially over English economics, until the mid-1870s, and he endeavored to use this authority to demolish what he regarded as the crude, inductive analysis of wages and efficiency propounded by

Barber 1985; Raff and Summers 1987). It has been suggested by Chris Nyland (1989) that the high-wage policies were motivated by labor shortages and that the major factor increasing efficiency was the dramatic rationalization of production methods under the impetus of "scientific management."

Brassey. There had been a number of favorable reviews of Brassey's book, but it was the one by Harrison (1872) that stung Cairnes into action. Harrison accepted Brassey's data and arguments unquestioningly and concluded that "with evidence like this before us, we may well hesitate to accept the professional dicta of so-called economists" (regarding the links among wages, productivity, profits, and costs; 278). Because Cairnes was one of the economists who clung to a watered-down version of the wages-fund theory after Mill's recantation, he felt compelled to mount a strong attack on the Brassey-Harrison position. Using somewhat sarcastic language, Cairnes described as "simple" the argument "that it often pays better to employ a good workman at high wages, than an inferior one at low" (1874, 281). He claimed that it was "an indubitable fact" and not a refutation of all that economists have written on the relation of wages to profits. But he was unprepared to go beyond this to "the implicit economic law" that the efficiency of labor varies with its price. Cairnes's counterargument missed the point because he based it on the central proposition that wages paid are constrained by competition. This hardly constituted a refutation but rather a misinterpretation, because Brassey never suggested that his analysis was ruled out in competitive labor markets. Furthermore, Cairnes conceded considerable ground by his argument that the link between labor efficiency and wages may only hold for unskilled physical work, linking the argument to the standard of living. This was after all the base and the starting point for the development of Brassey's position.

In the United States, among academic economists only Francis A. Walker developed a concerted analysis of the links between wages and labor efficiency. Walker was a critic of *laissez-faire* and a supporter of limited state intervention, a trenchant critic of those who subscribed to the wages-fund doctrine. In ironic style, he used the views of J. E. Cairnes as the starting point for developing his critique of economics after 1870. His most important contributions were made in his two books, *The Wages Question* (1876) and *Political Economy* (1887). Walker was outside the two main schools of economic thought of the time, the English and the German, while his own technique of analysis was relatively rudimentary and, to some extent, atheoretical.

The demolition of the wages-fund doctrine was the starting point for Walker's analysis of the links between wages and labor efficiency. By today's standards his analysis was both insightful and enlightened and did not confuse Brassey's Law with the economy of high wages. Wages

determined dietary standards, which in turn determined the efficiency of labor, according to Walker. He demonstrated a detailed knowledge of the Irish situation and made reference to Brassey's evidence on the impact of wages on the efficiency of English workers relative to Russian, French, and Indian workers (1887, 55–56, 368–69). Increases in wages not only improve dietary standards but also lead directly or indirectly to better hygiene and living conditions and to a greater investment by workers in their own training. "It is possible that an employer may pay high wages, and yet the cost of labor to him may prove to be low, by reason of the laborer's superior efficiency" (1887, 248). In his more comprehensive analysis in *The Wages Question*, Walker argued that the payment of higher wages allowed employers to maintain continuity in production linked to continuity of employment. These turnover-reducing effects were in the interests of employers because of on-the-job training and the acquisition of specific skills—"mutual adaptation" and the workmen's acquired knowledge of "the peculiarities of his employer's business, which is wholly additional to the mastery of the technicalities of the occupation" (1876, 300–1). Selection of the most desirable employees was also facilitated by the payment of high wages; this was reflected in the fact that the least senior workers, whose wages were usually lower, were laid off first (301).

The insights from Walker's analysis range over many of those found in modern efficiency-wage theories and the related analyses of the operation of internal labor markets. An especially telling argument was that employers may pay higher wages for efficiency reasons, but that they need not pay as much because of the specificity of the skills involved. So wages may not rise "proportionately to their work" because although "the workman may take from him [the employer] these advantages [specific knowledge and skills] *he can not carry them to any one else*" (1876, 302). And he even anticipated the possibility that wages above the market-clearing level would generate unemployment because employers "could not afford for a short time to take on new hands even at lower rates" (1876, 302). Thus, "simple competition" is negated in this case.

At the aggregate level, Walker predicted the possibility of unemployment. Reductions in wages would not only lower the efficiency of labor, they would also lead to lost output, which could not be recovered. Although he ruled out the possibility of overproduction, he argued that underconsumption was more than likely and injurious (1876, 286–87, 317–20). None of Walker's analysis was embedded in a rigorous ana-

lytical framework. His strong criticism of David Ricardo, Cairnes, and the "English" economists in general, his espousal of a modified form of Malthusianism, and his rejection of laissez-faire economics all combined to render Walker's views less palatable to the economics profession.

IV

Alfred Marshall must have read Brassey's *Work and Wages* soon after it was published in 1872; by May of the following year he was recommending the book to the women attending his *Lectures to Women*.⁹ Marshall made brief summaries of the main chapters of Brassey's book, focusing on the statistical evidence and emphasizing the link between wages and the "physical condition of labour" ("Earnings Theory 1—Labour and Theory of Wages," Marshall Papers).¹⁰ By 1874 Marshall had commenced work on a monograph on international trade.¹¹ Despite Marshall's description of this writing as "crude" (Whitaker 1975, 2:7), the analysis is clear and logically set out. Higher wages may be spent in improving the quality and quantity of the laborer's food, raising the efficiency of labor with a lag of a year or so. Over the course of a generation, improved nutrition would also be linked with greater opportunities for education and training, thus leading to "increased efficiency in the next generation" (2:24). Without directly referring to Brassey, an argument is presented that "foreign trade competition tends to equalise the money wages of the same task performed with the same efficiency, in different countries" (Whitaker 1975, 2:30). Here the analysis becomes somewhat convoluted, but as Whitaker notes (2:25), by the time of the publication of *Economics of Industry* (1879), Marshall had clarified his thoughts on the issue. One other highly significant feature of the discussion of

9. This was a nonuniversity lecture scheme intended to educate women otherwise excluded from Cambridge University. Marshall wrote brief notes on the books he recommended in order to guide the students' reading (see *Lectures to Women*, May 1873, Marshall Papers).

10. In the 1870s, Marshall also kept cuttings from the *Daily News* and the *Times* of the public reporting of Brassey's book and lectures. The emphasis in the public discussion was on the apparently superior efficiency of the "English" worker (see Miscellaneous Box 81, Population, Efficiency of Labour, Marshall Papers). The earliest reference by Marshall to the impact of a "real rise in wages" on laborers, who "by raising their physical and mental vigour increase the gross produce" may be found in a mathematical fragment dated between 1867 and 1872 (see Whitaker 1975, 2:275–77).

11. Portions of this were published privately by Henry Sidgwick with Marshall's consent (see Whitaker 1975, vol. 1 for details; the material on wages and efficiency is in part 1, chap. 4, reproduced in Whitaker 1975, vol. 2, especially 7–31).

wages and nutrition in Marshall's foreign trade chapters is the repeated stipulation that in the analysis of labor, "account" should be "taken of its efficiency" (Whitaker 1975, 2:22, 24). At this point Marshall had not fully developed his theory of distribution, but this was an early and clear recognition that a link between wages and efficiency was likely to complicate the analysis.¹² If the efficiency of labor is a function of the wage level, then it is both a cause and effect of higher wages. Marginal productivity is not uniquely determined, implying that there may be more than one equilibrium position.

The possibility of multiple equilibria represented both a problem, and in its resolution, a prospect for richer insights into economic processes. It was, therefore, reserved by Marshall for his growth volume, which he was already planning even before the publication of volume 1 of the *Principles* (Whitaker 1974). What he wrote about wages and efficiency in a static context in his *Economics of Industry* (1879) and *Principles of Economics* (1890) seems to have been hedged about to some extent.¹³

There can be no doubt that Marshall, in developing the link between wages and efficiency, relied on the work of his predecessors, at least back to Adam Smith, some of whom assumed that higher incomes increased work effort as living standards rose and the laborer strove to widen the range of goods consumed. As Marshall's version of the marginal productivity theory of distribution evolved, he developed an approach that accommodated variations in the efficiency of labor as wages rose. The central concept was propounded in the *Economics of Industry* (1879; written jointly with Mary Paley Marshall), in which they distinguished between "time wages—the wages that a man earns in a day" and "task wages—the wages that are paid to him for doing a given amount of work of a given quality" ([1879] 1881, 101). A rise in time wages measured in real terms, Marshall stressed, usually increases the standard of comfort and therefore the health and nutrition of current workers and, in addition, the nurture (including skills and education) of future generations. A rise in the efficiency of labor automatically followed. Symmetrically, a fall in wages when the level of wages was already low would lower the standard of comfort and efficiency of labor (Marshall and Marshall [1879] 1881,

12. In an earlier essay on wages (1870–74) Marshall assumed in his analysis that laborers were "in full bodily efficiency" (Whitaker 1975, 1:196). When subsequently he developed his distribution theory, he treated units of labor as homogeneous in terms of their efficiency.

13. Whitaker suggests that "a complex theory of economic growth which has largely gone unnoticed" was buried in the *Economics of Industry* (1972, 40).

102). This latter argument is supported with reference to Walker's book *The Wages Question* but Marshall makes no specific acknowledgment to Walker for the arguments presented. This may be explicable by the peculiarly ethical requirement Marshall makes—a rise in wages must lead to a rise, more or less permanent, in the standard of comfort. This calls for “appropriate” behavior on the part of the laborer and of the laborer's family.

In general Marshall thought that laborers would spend their increased time wages in such a way as to increase the standard of comfort and labor efficiency. Thus efficiency of labor is rendered endogenous, creating difficulties of analysis in a static framework. There was no attempt on Marshall's part to avoid these difficulties by arguing that simultaneous increases in wages and labor efficiency were exceptional. On the contrary, he argued the reverse (Marshall and Marshall [1879] 1881, 132). The way out was simply to take the time wage and its associated task wage as given at any point in time. It is the past *average* time wage that is the object of analysis—at any point in time exceptional workers may receive a higher time wage which “may be regarded as a kind of *rent*” (Marshall and Marshall [1879] 1881, 110).

When Marshall turned to the writing of the *Principles* in the 1880s, he somewhat tentatively developed his distribution theory, which allowed him to refine, but not develop, some of his earlier concepts on wages and efficiency. This refinement enabled him to observe that “highly paid labour is generally efficient and therefore not dear labour; a fact which . . . will be found to exercise a very complicating influence on the theory of distribution” (1961, 1:510). Presumably the complications arose because a rise in wages which changed efficiency meant that labor could not simply be measured in physical units, for this would differ from labor measured in such a way as to take account of efficiency—that is, labor measured in efficiency units.¹⁴ The efficiency of labor would also vary for any given task wage according to the quantity and quality of capital with which labor worked. So the analysis proceeded on the assumption that labor was of “normal” or “standard” efficiency working with capital of given value, generating the result that the marginal net product of labor is equal to its wage. But in progressing from this general theory of distribution to the specific explanation of the earnings of labor, Marshall

14. Marshall's problem is clearly discernible in the inherited difficulties J. Maynard Keynes had in choosing appropriate units of measurement for quantities of employment (see Keynes 1957, 41–42).

once again struggled with the concept of efficiency. He turned again to the distinction between task and time wages made in the *Economics of Industry*. He defined them in the same way as in that earlier work but after the third edition of the *Principles* renamed task wages "efficiency wages, or more broadly *efficiency earnings* . . . , that is, earnings measured . . . with reference to the exertion of ability and *efficiency required*" (1961, 1:549).¹⁵

The ambiguity of the phrase "efficiency of labor" was not cleared away by the use of the term "efficiency wages." In this essentially static analysis, Marshall argued that the forces of competition would lead to "a tendency to equality of efficiency earnings" (1961, 1:549), which he assumed would clear away the difficulties associated with increasing wages leading to changes in efficiency. Here there are allusions to but no specific reference to Brassey's analysis, and Marshall repeats Brassey's dictum "that high paid labour is really cheap" (1961, 1:565). Modern efficiency-wage-type arguments are then presented, suggesting that where expensive machinery is being used and supervision of work is important, it would pay the employer to offer higher wages. Marshall goes even further, suggesting that "it would be to the advantage of the employer to raise the time-earnings of the more efficient workers more than in proportion to their efficiency" (1961, 1:550).¹⁶ This proposition is analogous to those made in modern efficiency-wage theories, but the role to be played by competitive forces in generating a tendency to equality of efficiency earnings has now been abandoned. In his static framework, Marshall was unable to spell out the analytical implications.

The absence of a fully articulated dynamic model of the growth process has resulted in the oversight of some of the insights of Marshall's analysis. In the *Principles*, the last two chapters dealing with economic progress were intended to pave the way for Marshall's volume 2 on economic growth, a project which he finally abandoned around 1907. But little that is new appears in these chapters as Marshall repeats the argument that rises in wages may increase economic growth and the efficiency of

15. Most of this material is in the *Principles*, book 6, chaps. 1-5 and 11. Specific references to the wages-efficiency relationship may be found on 511, 516, 522, 528, 531-32, 546, 548-50, 662, 675, and 682-83.

16. Of course Marshall may not have regarded this as the most commonly occurring case. In the concluding chapter of the *Principles*, he again stresses that "the competition of employers tends to adjust wages of labour to its net product graduated according to efficiency" (1961, 1:705).

labor as long as the increased "standard of comfort" is translated into a rise in the "standard of life" as well (1961, 1:690-731). He argues that empirical evidence on such relationships may be unreliable because of the simultaneous changes in other economic, industrial, and social conditions and also because the long-run outcome may differ from the initial impact of any change in wages. In his much-delayed later books, especially *Industry and Trade*, where there was an obvious role for such a discussion, Marshall made but passing reference to the links between wages and efficiency. Instead he preferred to "modernise" but not to enlighten his work with a limpid discussion of remuneration and scientific management (1919, especially 350-54, 368-69, 377-78, 384-88).

My search through Marshall's published work has revealed numerous ideas pointing toward a more substantial analysis of the wages-efficiency links. But as Whitaker notes, these "tantalising hints" (1974, 17) seem never to have been advanced after the 1880s. Marshall's most coherent approach to the issue was written in the early 1880s when he was "experimenting" (the word is used deliberately) with the formulation of theories of growth and distribution. Whitaker has admirably demonstrated that Marshall was "a pioneer" in "the neoclassical theory of economic growth" (1974, 1) and that the outlines of the ideas were discernible in the *Economics of Industry* (1879). Some of the unpublished material referred to in Whitaker 1974 subsequently appears in Whitaker 1975 (2:305-16). Simple differential calculus is used to impart a dynamic element to Marshall's analysis. The rate of change of labor efficiency is assumed by Marshall to depend on the labor force measured in efficiency units, the amount of capital, the state of technology, and on the level of time wages. One stage further back, the standard of comfort is also changing over time in response to the level of time wages.

By modern standards Marshall used an elementary approach to dynamic analysis, yet it was a promising start. That it was tentative and experimental may be gauged from the unpublished manuscript printed in volume 2 of Whitaker 1975, which shows that Marshall tried several functional forms for the main relationships. It is also clear that he was still feeling his way with the reasoning underlying the dynamic formulations. Much of it was sketchy; he was often uncertain whether the first derivatives of various functions would be positive or negative, and sometimes he made no attempt to assign a value to them. This can also be seen in a small amount of additional unpublished material in the Marshall Papers that immediately follows what was subsequently published in Whitaker

1975 and referred to above. Unfortunately it is even less coherent and less decipherable, but it clearly conveys the uncertainty about this dynamic analysis that Marshall felt.¹⁷

Marshall's contribution therefore consisted of the emphasis he placed on the links among wages, the standard of comfort, and the efficiency of labor. The connection was stressed throughout the remainder of Marshall's writing life. It was raised in Marshall's exchanges with witnesses in the Royal Commission on Labour (1893–94, especially 245–327) and regularly recurs in unpublished material scattered throughout his papers right up to 1923.¹⁸ There is no further advancement of the theory in this later material, except perhaps for his mention of the idea prevalent in some modern theories that high wages may "attract men of more than ordinary efficiency" (Supplementary Notes on Remuneration, etc., Miscellaneous Box 2, Marshall Papers). Without doubt Marshall's analysis of the wages-efficiency links was more rigorous than the analyses of others who expressed the same ideas, yet his approach led him to accept the empirical evidence, especially Brassey's, without subjecting the nature of the relationships to closer scrutiny.

V

John A. Hobson (b. 1858–d. 1940) was never admitted to the hallowed circle of academic economists apparently because of his early heretical underconsumption views, followed later by his rejection of laissez-faire competitive economics and his consistent attacks on the conservative views of the classical economists (Cole 1940; Brailsford 1948; Hobson [1909] 1974, [1938] 1976; Freedman 1990). Such an attack on "the leading English economists of the first half of the nineteenth century" ([1894] 1926, 352) is the springboard for the development of his exposition of the economy of high wages. These economists preached "the doctrine of the economy of low wages" (353), reinforcing the views and practices of

17. It is almost voyeuristic for the historian of economic thought to be poking around in the obviously preliminary musings of a deceased economist and to be noting every tentative idea, every trial and its abandonment, and every scratching out. In Marshall's case it may be justified by his avowed objective to write a volume on dynamic economics, which if it had come to fruition may have rivaled his *Principles*.

18. Several examples dated variously 1902, 1905, and 1923 may be found in Miscellaneous Box 2, Marshall Papers. This material was apparently assembled for inclusion in the planned volume 2 of the *Principles*, which was to deal with the analysis of growth (*The Conditions of Economic Progress*).

the business community. But in the last decade of the nineteenth century, it was the published experiences of Brassey and Schoenhof that provided Hobson with some of the empirical evidence to support his theoretical analysis of the wages-efficiency link.

Although Hobson vigorously attacked the proponents of the "dogma of the economy of cheap labour" (352) from Ricardo onward, he did not uncritically accept the empirical evidence and arguments of Brassey in Britain and Schoenhof and Walker in the United States. Specifically, Hobson subjected to close scrutiny Brassey's Law "that, for a given class of work, there is a fixed and uniform relation between wages and efficiency of labour for different lands and different races" (Hobson [1894] 1926, 356). At the outset there was one glaring statistical deficiency in Brassey's analysis, which did not allow for differences in purchasing power between countries. It was purchasing power that determined the standard of living, which in turn affected the efficiency of labor. Only if one or the other of two specific assumptions held was it possible to rescue Brassey's Law. The first was a strictly linear relation between the worker's consumption and "output of productive energy" ([1894] 1926, 356) in which these are determined by the rate of wages in each country. It was an assumption easily dismissed by Hobson, for he observed that apart from wages, the efficiency of labor depended additionally on at least "race, climate and social environment" (356). The second assumption called for perfect mobility of capital and labor, and it was summarily dismissed. Thus, Brassey's Law fails to hold, but Hobson still argued that Brassey's evidence and analysis nevertheless supported "a general theory of the economy of high wages" ([1894] 1926, 357). Hobson thought that the correlation between high wages and efficient labor was accepted too readily by Brassey and other writers, "without attempting scientifically to explain the connection" (358). He set out to redress this deficiency with a thorough review of the empirical evidence for the United States, Britain, Europe, and India.

Although he concluded that higher wages usually led to an increased standard of living and a rise in the efficiency of labor, the relationship was by no means immutable. In some cases the direction of causation was reversed. Even if the link was from wages to productivity of labor, there were limits to the profitable increase of wages. Without using the jargon of economists, he presented an analysis concluding that the factor proportions associated with the firm's production function helped to determine these limits. Increases in efficiency accompanying a rise in wages in some conditions of production may not lead to an increase suf-

ficiently large to compensate the firm. In this case, higher wages generate increased efficiency and lower profitability for the firm. Hobson recognized the central difficulty of the *ceteris paribus* methodology that is involved by stressing that the relationship between wages and efficiency ran in both directions so that it was "clearly one of mutual determination" ([1894] 1926, 368).

The analysis was more complex when the methods of production involved labor cooperating with machinery. In such cases, it was conceivable that the payment of higher wages might elicit a rise in efficiency, "but the price of labour measured in terms of effort" (369) might also be higher. Hobson develops an argument suggesting that work effort may increase as wages rise, especially if skills and physical capabilities increase with the wage. There is a limit to the ability of workers to deliver increased work effort as wages rise. The reasoning seems analogous to that underlying R. Solow's well-known article (1979), showing that profit-maximizing firms will hire labor and pay a real wage so that the elasticity of work effort with respect to the wage is unity. This is the efficiency wage. Beyond that wage, work effort will begin to decline, which is precisely the analytical argument made by Hobson. "It would clearly be impossible by a number of rapid reductions of the working day and increases of time wages to force the effectiveness of an hour's labour beyond a certain limit for the workers" ([1894] 1926, 370). However, this limit could be interpreted as referring to a physical maximum and not to one dictated by profit maximization.

To a large extent, Hobson expected the amount of work effort elicited by a higher wage to be limited by physiological factors. This was an "objective economic question." Clearly he did not perceive the situation as one in which shirking was the norm. However, he thought the "subjective economic question" of the worker's response to having to deliver greater work effort in return for a higher wage was also relevant.¹⁹ Higher wages are often associated with new wants and an increased demand for leisure time to be devoted to consumption. Yet the higher wages may call for work effort of such intensity that it renders the worker incapable of effectively utilizing leisure time.²⁰ Even if the incentive to increased work effort was absent, there remained the macroeconomic argument

19. When he examined the comparative wage-efficiency data for various countries, Hobson speculated that the high productivity of workers in the United States could equally be explained by "psychical factors" ([1894] 1926, 363) in addition to the physiological ones.

20. Hobson regarded the link between wages and work effort as of limited applicability to the group of occupations in what are today classified as service industries.

that increased wages may stimulate aggregate demand. Here Hobson was linking his case for high wages to his well-known underconsumption thesis. Higher wages imply a redistribution of income toward workers who would spend the extra income, which would otherwise have been saved. That is, certain classes having already satisfied their "normal healthy wants" (Hobson [1894] 1926, 375) refuse to exert "their power to consume" and instead "insist upon storing it in unneeded forms of capital (which was) directly responsible for the slack of employment and capital" (375). It followed that "the surest support of the 'economy of high wages' is the conviction that it will operate as a stimulus to industry through increased consumption" (377).

In his subsequent and prolific writing, Hobson did not develop the analysis much further. However, he always wrote as if the economy of high wages was an established proposition not requiring further elaboration (see Hobson 1910; 1911; 1914; 1922a; 1922b; and 1927 for examples). Hobson began to regularly use the phrase "wage of efficiency" to describe the wage that not only satisfied the worker's physiological needs but was also sufficient to evoke the worker's will to work. This wage of efficiency was one that "an intelligent employer will in his own interest pay" (1927, 51; see also 1922a, 88–89; 1910, 68–69). But he also stood by his view that there are always limits to the increases in efficiency higher wages can evoke and that these limits differ for every firm.²¹

VI

Discussions of the economy of high wages in the nineteenth century were shaped by the influential writings of the amateur economists. These practical men of affairs—these amateurs—most strongly supported the existence of a causal link from higher wages to increased productivity of labor. At times they conflated the concepts of Brassey's Law and the economy of high wages. Academic economists who were aware of the writings of Brassey and Schoenhof were somewhat more careful and rigorous in this respect. In the United States, F. A. Walker adopted a sounder theoretical base, although not an especially rigorous one. In

21. In his book, *The Conditions of Industrial Peace*, he analyzed the case of Henry Ford's motor company to illustrate the point (1927, 59). A recent interesting analysis examines whether Henry Ford paid efficiency wages (see Raff and Summers 1987). A systematic review of pre-efficiency wage theory contributions in the twentieth century has not yet been produced, but for brief discussions see Austin and Lloyd 1926 and Barber 1985.

Britain, the influence of the amateurs can be seen on Alfred Marshall, who provided the most rigorous approach, grounding his analysis on the distinction between task wages and time wages. Marshall was compelled to adapt his methodology in order to deal with the complications caused for marginal productivity theory by a perceived link between higher wages and increased efficiency of labor. Much of the most interesting material by Marshall is in his unpublished manuscripts, where it emerges that he was attempting to place the wages-efficiency analysis in a dynamic context.

Paradoxically, J. A. Hobson, the academic outcast, produced the most convincing analysis. He effectively refuted the assertion of Brassey's Law that there was a fixed relationship between wages and efficiency across countries and peoples and, at the same time, provided analytical support for the economy of high wages. Hobson developed the important insight that there was a point beyond which any additional increase in wages would be associated with a less than compensating increase in the efficiency of labor. Although he was prepared to generalize the economy of high wages as a guide to welfare-increasing wages policy, he nevertheless argued consistently that there were always significant exceptions to the generalization. This aspect of his views would hardly have enamored him to those in the union movement who supported higher wage claims, reduced hours, and the eight-hour day with implicit or explicit reference to the economy of high wages. Chief among this group were Sydney and Beatrice Webb (see Webb and Webb [1894] 1920; [1897] 1920; [1902] 1920). In his evidence before the Royal Commission on Labour (1893-94), when he was questioned by Alfred Marshall, Webb argued cautiously that a rise in wages would not necessarily lead to a rise in costs of production (1893-94, 322) because of a likely increase in efficiency.²² The role played by the development of the economy of high wages in the important debate on wages and hours of work at that time warrants detailed investigation.

References

- Akerlof, G. A., and J. L. Yellen. 1986. *Efficiency Wage Models of the Labour Market*. Cambridge: Cambridge University Press.

22. Marshall and Webb had an acrimonious exchange at one point during the questioning. On the following day, Webb apologized for his aggressive behavior, attributing it to tiredness (see Royal Commission on Labour 1893-94, 245-327 for Webb's testimony).

- Austin, B., and W. Francis Lloyd. 1926. *The Secret of High Wages*. London: T. Fisher Unwin.
- Barber, W. J. 1985. *From New Era to New Deal*. New York: Cambridge University Press.
- Bliss, C., and N. Stern. 1978. Productivity, Wages and Nutrition. Part I: The Theory and Part II: Some Observations. *Journal of Development Economics* 5:331–98.
- Brailsford, H. N. 1948. *The Life-Work of J. A. Hobson*. London: L. T. Hobhouse Memorial Trust Lecture No. 17.
- Brassey, Thomas. 1872. *Work and Wages*. London: Bell and Daldy.
- . 1878. *Lectures on the Labour Question*. London: Longmans, Green.
- . 1916. *Work and Wages*. Reissued with an introduction by his son, the Earl Thomas Brassey. London: Longmans, Green.
- Cairnes, J. E. 1874. *Some Leading Principles of Political Economy*. London: Macmillan.
- Chapman, S. J. 1904. *Work and Wages*. London: Longmans, Green.
- Coats, A. W. 1958. Changing Attitudes to Labour in the Mid-Eighteenth Century. *Economic History Review* 11.1:35–51.
- . 1971. *The Classical Economists and Economic Policy*. London: Methuen.
- . 1992. *On the History of Economic Thought*. London: Routledge.
- Cole, G. D. H. 1940. J. A. Hobson. *Economic Journal* 50 (June): 351–60.
- Dasgupta, P., and D. Roy. 1986. Inequality as a Determinant of Malnutrition and Unemployment: Theory. *Economic Journal* 95 (December): 1011–34.
- . 1987. Inequality as a Determinant of Malnutrition and Unemployment: Policy. *Economic Journal* 96 (March): 177–88.
- Edgeworth, F. Y. 1894. Review of Papers and Addresses by Lord Brassey. *Economic Journal* 4:688–89.
- Freeden, M., ed. 1990. *Reappraising J. A. Hobson: Humanism and Welfare*. London: Unwin Hyman.
- Gilman, N. P. 1904. *Methods of Industrial Peace*. London: Macmillan.
- Harrison, F. 1872. Mr. Brassey on Work and Wages. *Fortnightly Review*, n.s., 12:268–86.
- Helps, A. 1872. *Life and Labours of Mr. Brassey*. London: Evelyn, Adams, and Mackay.
- Higgs, H., ed. 1926. *Palgrave's Dictionary of Political Economy*. London: Macmillan.
- Hobson, J. A. [1894] 1926. *The Evolution of Modern Capitalism*. London: Walter Scott.
- . [1909] 1974. *The Crisis of Liberalism*. Edited by P. F. Clarke. Brighton: Harvester.
- . 1910. *The Industrial System*. 2d ed. London: Longmans, Green.
- . 1911. *The Science of Wealth*. London: Williams and Norgate.
- . 1914. *Work and Wealth*. London: George, Allen, and Unwin.
- . 1922a. *The Economics of Unemployment*. London: George, Allen, and Unwin.

- . 1922b. *Incentives in the New Industrial Order*. London: Leonard Parsons.
- . 1927. *The Conditions of Industrial Peace*. London: George, Allen, and Unwin.
- . [1938] 1976. *Confessions of an Economic Heretic*. Edited by M. Freedon. Brighton: Harvester.
- Howell, G. 1878. *The Conflicts of Capital and Labour*. London: Chatto and Windus.
- Jeans, J. S. 1884. On the Comparative Efficiency of Labour at Home and Abroad. *Journal of the Royal Statistical Society* 47:614–55.
- Kane, Robert. 1845. *Industrial Resources of Ireland*. 2d ed. Dublin: Longman and Company.
- Katz, L. F. 1986. Efficiency Wage Theories: A Partial Evaluation. In *National Bureau of Economics Research Macroeconomics Annual*. Edited by S. Fischer. Cambridge, Mass.: MIT Press.
- Keynes, J. M. 1957. *The General Theory of Employment, Interest and Money*. London: Macmillan.
- Leibenstein, H. 1957. The Theory of Underemployment in Densely Populated Backward Areas. In *Economic Backwardness and Economic Growth*. New York: Wiley.
- Marshall, Alfred. Papers. Marshall Library. Faculty of Economics and Politics, Cambridge University, Cambridge, England.
- Marshall, Alfred. 1890. *Principles of Economics*.
- . 1919. *Industry and Trade*. London: Macmillan.
- . 1961. *Principles of Economics*, 9th variorum ed. 2 vols. London: Macmillan.
- Marshall, Alfred, and Mary Paley Marshall. [1879] 1881. *The Economics of Industry*. 2d ed. London: Macmillan.
- Mill, John Stuart. [1871] 1965. *Principles of Political Economy*. London: Routledge and Kegan Paul.
- Mundella, A. J. 1878. What Are the Conditions on Which the Commercial and Manufacturing Supremacy of Great Britain Depend? *Journal of the Royal Statistical Society* 41:87–112.
- Nyland, C. 1989. *Worktime and the Management of Production*. Cambridge: Cambridge University Press.
- Raff, D. M. G., and L. H. Summers. 1987. Did Henry Ford Pay Efficiency Wages? *Journal of Labor Economics* 5:57–86.
- Royal Commission on Labour. 1893–94. Final Report. Part 1. London: Her Majesty's Stationery Office.
- Schoenhof, J. 1885. *The Industrial Situation and the Question of Wages*. New York: G. P. Putnam's and Sons.
- . 1892. *The Economy of High Wages*. New York: G. P. Putnam's and Sons.
- Smith, Adam. 1976. *An Inquiry into the Nature and Causes of the Wealth of Nations*. vol. 1. Edited by R. H. Campbell, A. S. Skinner, and W. B. Todd. Oxford: Clarendon.
- Solow, R. 1979. Another Possible Source of Wage Stickiness. *Journal of Macroeconomics* 1.1 (Winter): 79–82.
- Thornton, W. T. 1870. *On Labour*. 2d ed. Shannon: Irish University Press.

- Walker, F. A. 1876. *The Wages Question*. New York: Henry Holt.
- . 1887. *Political Economy*. 3d ed. London: Macmillan.
- Webb, S., and B. Webb. [1894] 1920. *History of Trade Unionism*. London: Longmans, Green.
- . [1897] 1920. *Industrial Democracy*. London: Longmans, Green.
- . [1902] 1920. *Problems of Modern Industry*. London: Longmans, Green.
- Whitaker, J. K. 1972. Alfred Marshall: The Years 1877 to 1885. *HOPE* 4.1:1–61.
- . 1974. The Marshallian System in 1881: Distribution and Growth. *Economic Journal* 84 (March): 1–17.
- . 1975. *The Early Economic Writings of Alfred Marshall, 1867–1890*. 2 vols. London: Macmillan.