The Other Faces of the Industrial Revolution*

——A Review Essay——

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"..... if one looks at the economy as a whole rather than at its most novel and striking features, a less orderly canvas might be drawn——one bearing more resemblance to a Bruegel or even a Hieronymus Bosch than to the geometrical regularities of a modern abstract."[1)]

In the textbooks of economic and social history, economic development, and any other historical social studies, the English industrial revolution has long been treated as a revolutionary change, symbolised in machinery and the establishment of the factory system, especially the ones in cotton and iron and steel. Such a breakthrough took place in means of production, motive power, firm size and work organisation, the other side of which is the destruction of skills and the replacement of traditional artisans by unskilled and semi-skilled factory workers. There have of course been many disagreements among economic and social historians about specific topics concerning the industrial revolution, as found in the century-long debate between the so-called optimist and pessimist camps. This debate, however, has tended to be focussed upon economic and social *consequences* of the change. Few has so far questioned the whole image of the industrial revolution as a technological breakthrough, a change centred on steam power and the factory. And even in the debate on the economic consequences of the coming of the factory and machinery, attention has tended to be paid to changes in the *general level* of living standards of the working class. Except for a few notable attempts, long-term changes in economy-wide inequality patterns has been a relatively neglected subject. More recent "new" economic history, particularly macro-economic works, which have provides us with some serious, analytical findings, do not yet always serve as a corrective to the stereotyped image of the change. Indeed, it is probable that despite a general rise in the level of income and wages, earnings inequality did widen with industrialisation, and that the widening of inequality was not only due to the effects of power revolution, as revealed in the plight of handloom weavers, but more to other changes associated with the so-called industrial revolution.

It is true that there is no lack of evidence whih does not fit the conventional notion of the industrial revolution. Such facts are in fact numerous, but scattered, and a mere enumeration of those scattered pieces of evidence is not sufficient to correct biases made by the textbook interpretation. What is necessary now is to arrange them along an assembly line with a fresh idea or model keeping in mind.

Maxine Berg's recent book on *The Age of Manufactures* is such an attempt, to raise fresh questions about this old subjectmatter. She argues that more attention ought to be paid to continuity from earlier periods, for industrial development before the industrial revolution, say, from the turn of the century to 1780, was gradual but substantial. And even where we have to talk of discontinuity, she draws our attention to its "polymorphic" character, because there were——according to her ——always "alternatives" to the path to the factory system and mass production. Indeed, the very first sentence of its preface tells us clearly what she wants to say: "This book is about some aspects of the other Industrial Revolution, an Industrial Reolution which included domestic industry and artisan workshops much more than it did

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* Maxine Berg, *The Age of Manufactures: Industry, innovation and work in Britain, 1700-1820* (Oxford: Basil Blackwell, 1985. 378 p. £ 22. 50); Jeffrey G. Williamson, *Did British Capitalism Breed Inequality?* (Boston and London: George Allen and Unwin, 1985. ix+270 pp. $ 28.50).

1) R. Samuel, "The workshop of the world: steam power and hand technology in mid-Victorian Britain," *History Workshop Journal*, no. 3 (1977), p. 58.

the factory system; an Industrial Revolution which relied on tools, small machines and skilled labour much more than it did on steam engines and automatic processes; an Industrial Revolution which was created by women and children at least as much as it was by male artisans and factory workers"(p. 11).

It seems to me that the book has succeeded in challenging the orthodox interpretation. The targets of her challenge include, not only the classics, such as David Landes[2], and more recent new economic history works, but also the Marxian theories of "primitive accumulation" and the "labour process" as well as the model of "proto-industrialisation." The latter models are examined in more detail, and are given the verdict that "both [Marxian and proto-industrial] models assume the factory to be the ultimate method of organizing labour, and modern power-based machinery to be the best practice technology" and thus fail to take into account the fact that "[e]ighteenth-century manufacture was practised in all manner of different settings; it was organised along many different lines [such as putting-out, artisan, and cooperative forms], each of which was rational or legitimate in its own environment" (pp. 83-84, see also p. 194). Indeed, the rest of the book may best be regarded as an elaboration of, and also a development of this argument, giving in Part Two in particular detailed, factual accounts of various aspects of change in the two key industries, i. e. textiles and metals, by focussing on the type of technology and its relationship with a specific structure of work organisation.

While Berg successfully demonstrates how diversified the eighteenth-century manufacturing structures were, and to what extent each of the structural form was dynamic, and hence that "[t]here was no necessary progression from one to another"(p. 317), so that change took place "not in a linear but more frequently in a cyclical pattern" (p. 90), the author does not seem to provide us with her own new models. Of the two chosen industries, for textiles she does set out an interesting and stimulating argument. By singling out one characteristic pattern of some kind of convergence from an extremely complex picture of change, she notes that "[t]he sweating system and the factory system were the *two* endpoints which the textile industries reached by the latter half of the nineteenth century"(p. 229, italics added). It is worth stressing again that it was not one single endpoint, but two, that industrialists saw in the late nineteenth century. However, micro-economics of such a multilineal change is not yet quite clear. As for the metal industries, her account in Chapters 11 and 12 would probably leave the reader a little frustrated, since her major conclusion is just that any existing theories do not fit the complicated picture of the early nineteenth-century metal trades, especially those in Birmingham. It might be that her stress here is placed more on tradition than on novelty. Certainly she seems to attach much importance to "artisan independence" and skilled craftsmen's adaptability to new circumstances, so that "[t]he industrialization of the metal trades took on its own special form within the framework of artisanship and handicraft"(pp. 285-286, see also p. 196). But, how the traditional artisanship could develop a "special" new form of skill formation, recruitment and work organisation, why such a new form of artisanship was viable in new circumstances, and whether or not is it the Sabel-Zeitlin type of perspective that she has in mind when talking about "alternative" developments,[3] the answers to these questions are unfortunately rather vague. Perhaps, to borrow the author's own words, the "other" industrial revolution "still waits its economic theorist"(p. 134).[4]

At any rate I shall come back to these points later, and now turn to the other work which concerns another face of the industrial revolution.

The question, *Did British Capitalism Breed Inequality?*, which the cliometrician Geffrey Williamson chose for his title, is a century-old one. However, despite a suggestion made by the economic historian T. S. Ashton, as early as 1949, that the sharp division of opinion between the optimist and pessimist writers was a reflection of the existence of two different groups "within the working class" and, hence, of a rising earnings inequality,[5] and despite a well-stylised fact in

2) D. S. Landes, *The Unbound Prometheus: Technological change and industrial development in Western Europe from 1750 to the present* (Cambridge: Cambridge University Press, 1969).

3) C. Sabel and J. Zeitlin, "Historical alternatives to mass production: politics, markets and technology in nineteenth-century industrialization," *Past and Present*, no. 108(1985), pp. 133-176.

4) This is a phrase levelled against a model of the proto-industrial family economy put forward by Hans Medick and others.

5) T. S. Ashton, "The standard of life of the work-

development economics that income inequality tends to show an early-rise and late-decline pattern as economic development proceeds (the so-called Kuznets curve),[6] little is yet known about actual changes in wage and income inequality during the industrial revolution. As to wage differentials for the period after the mid-nineteenth century, there are some works by wage historians and labour economists (such as Phelps-Brown and Lydall), and for broad trends in income inequality over a longer time-period, "guesstimates" by contemporary political arithmeticians or social statisticians (such as Massie and Dudley Baxter) are available. But as far as the period of the industrial revolution is concerned, the hot debate on poverty has been centred on the general level of living standards; virtually no quantitatively serious work has been done to test Ashton's suggestion in a longer-term perspective of the Kuznets hypothesis.

Indeed this is exactly what Williamson aimed at in his book. He sets out series of nominal and real wages for different occupational groups, skill differentials in wage earnings ("pay ratios"), the Gini coefficients, and other inequality measures, linking the industrial revolution period to that of Pax Britannia. His series are based on adult male wage data for eighteen occupations, a far larger body of data than that any other previous estimates utilised. Not only farm labourers and building craftsmen, but other artisan-type workers and also white-collars are taken into account. The trends that emerged from these estimates are clear enough: they do reveal the Kuznets curve. There was a sharp increase in inequality up to some time in the mid-nineteenth century, which was followed by a modest but continuous decline well into Edwardian years. Throughout the whole period in question, the real wage level was, generally speaking, on the increase. One important exception to this is the Napoleonic war period of 1793–1815. During that critical period wages lagged behind price rises, so that real earnings fell. But so did earnings inequality, which would suggest that if there had been no wars, then there would have been a more marked increase in the working-class's standards of living during the industrial revolution, but at the same time there would have been a far sharper rise in inequality. These conclusions are supported with other sources, i.e. by exploiting income tax records and so far rarely used data of inhabited house duties and window taxes, and also by revising oft-quoted tables of social arithmetic by Massie, Colquhoun and Dudley Baxter. Williamson's findings are in disagreement with the view accepted in wage history and social statistics, as he himself claims that "[s]ome prominent British wage historians may be stunned" by these findings (p. 43). But his estimates do support the Ashton hypothesis, although Ashton talked about the two groups *within* the working class, while Williamson's indices include white-collar occupations.

The rest of the book is devoted to uncover the sources of this British Kuznets curve. The method the author employed is a cliometrician's, and in Part III he demonstrates how his general equilibrium system of simultaneous equations works. One may wonder, apart from a question of likes and disliakes, if such a fiddling of macro-economic model is too bold an attempt to deal with a subtle problem. However, the author's hypothesis is clear-cut and worth examining: he argues that the industrial revolution period saw an unbalanced growth in productivity with the manufacturing sector growing faster than others. Since "[e]arly industrialization tends to be very capital and *skill* intensive (pp. 82–83, italics added), it means that the increased demand for skilled labour caused a skills shortage. By saying so, he implies that the "demographic forces 'from below' [i. e. factors which would force the unadvantaged to become even poorer] played no role in accounting for British inequality trends in the nineteenth century" (p. 159). To put it differently, "[m]uch of the rise in earnings inequality up to mid-century can be explained by very inelastic skill supplies. Much of the leveling after mid-century can be explained by a much more elastic supply, which seems to have produced an acceleration in the rate of skills-deeping" (p. 202).[7]

Are these statements all warranted? Now let me examine them by referring to Maxine Berg's arguments.

ers in England, 1790–1830," *Journal of Economic History*, Supplement ix (1949), p. 38.

6) S. Kuznets, "Economic growth and income inequality," *American Economic Review*, vol. xlv (1955), pp. 1–28.

7) There is another area which occupies a significant place in Williamson's book, i.e. the question of why Britain's economic growth slowed down during the Napoleonic wars. The *Explorations in Economic History* devotes its July 1987 issue to the discussions of this question.

To review Berg's and Williamson's books together must have appeared to be a strange combination, the two being very different in scope, methodology and style. However, besides the fact that both tackle with the other faces of the industrial revolution, one can make a few points in relation to some of the issues and arguments put forward in each book.

First, there is one weakness in Williamson's documentation of inequality. He was concerned only with adult males. He is aware of this drawback, thus saying that "[t]he debate over inequality and living standards could certainly use more evidence on the secondary labor force——wives and children" (p. 203). The same can be said about unemployment and pauperism, of which the author is also well aware. This is a data problem. However, to argue that demographic forces "from below" do not account for the widening of inequality during the industrial revolution is another matter. Population increase *per se* has an adverse effect on male adult labour markets, but such an adverse influence must be felt far stronger on the secondary workforce. As I argued elsewhere, in the household context, an increase in fertility, a deterioration of the breadwinner's take-home wages, or the combination of both, could put quite strong pressure on the supply of labour by the wife and older children, and hence, on thier wages.[8] It is therefore likely that sex differentials in wages also widened when population increased faster. Wages for unskilled males were perhaps stagnant, but wages offered to females and children may have been actually falling. And it is precisely in this context that one of Berg's claims can best be understood, the claim that the sweating system was one of the endpoints reached after the industrial revolution. To understand why women's and children's labour was "a lucrative source of profit not to be bypassed by manufacturers ready to launch new labour-intensive industries" in the age of mechanisation (p. 146), it is crucially important to get to know how earnings differentials between the primary and secondary workforce behaved during the whole period in question.

Secondly, Williamson talked about an "inelastic" supply of skills and increasing premiums paid to skilled workers in the first half of the nineteenth century. The argument that mechanisation was skill-intensive rather than skill-saving is an interesting one; in fact, it is plausible. But, who were "skilled" workers? Who were in shortest supply? One may suppose that they were found among high-paid occupations in mills, factories and dockyards. However, his own data set reveals that it is not. The following shows changes in earnings differentials from 1815 to 1911 set out in a slightly different manner from what Williamson did, the skilled being divided into blue-collar and white-collar occupations, and all the ratios being expressed as to earnings of the non-farm unskilled :[9]

Year	Farm labourers	Skilled blue-collar	Skilled white-collar
1815	0.74	1.27	3.87
1819	0.77	1.31	4.46
1827	0.58	1.22	4.27
1835	0.57	1.21	5.75
1851	0.53	1.20	6.13
1861	0.65	1.29	5.88
1871	0.68	1.38	5.59
1881	0.67	1.41	5.28
1891	0.57	1.26	4.20
1901	0.55	1.23	3.54
1911	0.59	1.34	3.12

It is quite clear from this re-calculation that what was crucial is *not* the behaviour of skilled blue-collar worker's wages, *but* of skilled white-collar's. For the first half of the nineteenth century, the farm sector also contributed to the rising inequality, but its contribution became nil in the latter half. Within the working class, on the other hand, the differential was not particularly great and impressively stable throughout the whole period. As to the group of white-collars, most of the occupations included, in fact, show quite articulated a pattern of early rise and late decline even in nominal terms. Solicitors, and barristers' earnings, to cite an extreme (or dubiously dramatic?) case, shot up from £ 447.50 in 1815 to £ 1837.50 in 1851, then declined to £ 1343. 50 in 1911. Even the far less volatile group of "government high-wage" occupations experienced a rise from £ 195.16 in 1815 to £ 281.02 in 1871, then a fall to £ 161.61 in 1911. On the other hand, the average of five skilled blue-collar occupations fell in the range of £ 50–60 during the first half of the nineteenth century, and increased to the level

8) O. Saito, "Labour supply behaviour of the poor in the English industrial revolution," *Journal of European Economic History*, vol. x (1981), pp. 633–652.

9) Calculated from Williamson, *op. cit.*, pp. 12 and 29, with employment weights reported in his "The structure of pay in Britain, 1710–1911," *Research in Economic History*, vol. 7, ed. P. Useling (Greenwich, Conn. : JAI Press, 1982), pp. 31 and 33.

of more than £100 at the turn of the century——far less dramatic a change. This group covers shipbuilding, engineering, building, printing and cotton spinning. Quite interestingly, the four other than cotton spinning[10] correspond to four of the five industries with which Charles More identified "new-style" apprenticeship was associated——industries in which one can see some kind of continuity in the way in which skills were trained.[11] Despite a conventional view of old apprenticeship declining with eighteenth-century developments and with the industrial revolution, it did survive in many trades well into the nineteenth century, and those five growing industries developed a new form of apprenticeship as an integral part of the skill formation system required in a new era. All this, therefore, suggests that Williamson's explanation is not quite adequate. Early industrialisation is likely to have been skill-intensive. Yet, as far as Britain's case is concerned, skills which were in shortest supply seem to have been found in the service sector, not in the manufacturing sector.

As to working-class occupations, however, wage historians' view that skill differentials in earnings were more or less stable, still carries weight. It may be because the growth in manufacturing output during the industrial revolution was to some extent accounted for, as Berg suggests, by an expansion of "labour-using" industries——industries which relied on unskilled or semi-skilled labour. It may also be that even within the industries which required machines and skills, the supply of skills was not particularly inelastic. Skilled workmen such as fitters, turners, iron-molders, and shipwrights, may have been found among those supplied through traditional channels. Furthermore, the suggestion that there were "alternatives" to the factory and mass production might be worth examining in this context. What is certain at this stage is perhaps that the British industrial revolution had many faces, and that the canvas of its portrait is far less orderly than has customarily drawn.[12]

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10) The exclusion of cotton spinners from the above recalculation does hardly change the average nominal earnings figures and the ratios to the non-farm unskilled.

11) C. More, *Skill and the English Working Class, 1870–1914* (London : Croom Helm, 1980), chs. 3 and 5. For eighteenth-century trends, see K. D. M. Snell, *Annals of the Labouring Poor : Social change and agrarian England, 1660–1900* (Cambridge : Cambridge University Press, 1985), ch. 5, "The decline of apprenticeship."

12) After the draft of this piece had been sent into the press, I came across an interesting criticism of Williamson's book: R. V. Jackson, "The structure of pay in nineteenth-century Britain," *Economic History Review*, Sec. Ser. vol. xl (1987), pp. 561–570. He argues that earnings data used by Williamson for lawyers and doctors are seriously flawed, and demonstrates that the revised series of "pay ratios" with these two excluded "no longer conform to any simple version of the Kuznets curve" (p. 567). Indeed, he makes a point quite similar to the arguments put forward above; but at the same time, his emphasis seems to be placed more on the differing behaviour of agricultural and non-agricultural earnings.