

Recent Findings of Research in Economic & Social History

Whether the Industrial Revolution was a great turning point in women's lives has long been debated. What has received less attention has been the gendered nature of the workforce at this time. In this challenging article Dr Berg argues that greater attention to this important issue alters our understanding of industrialisation.

Women's Work and the Industrial Revolution

The Industrial Revolution, traditionally associated with the late eighteenth and early nineteenth centuries, has long been seen as the great historical turning point in the nature of women's working lives. For with it came a reorganisation of the production process which separated the household from the workplace. A debate has raged among both feminists and historians since the early years of this century over the positive and negative impact of industrialisation on women's workforce participation and status. Optimists have argued that industrialisation and the factory brought gains in employment and higher wages which improved women's status within the family. Pessimists have argued that women's jobs were narrowed to less skilled and less valued work, and that women's social position was degraded by the decline of the household economy.

In spite of feminist pronouncements on this crucial historical period, and in spite of significant quantitative research on the social and economic structures of eighteenth-century Britain, we are as yet no closer to definitive conclusions on this debate than were the first generation of women's historians, Alice Clark, B. L. Hutchins, Dorothy George and Ivy Pinchbeck. These historians, in the inter-war years, wrote the first sustained historical studies of working women. They were seeking to understand the constraints on women's working lives in a historical transition associated with mechanisation and the rise of the factory system. The books they wrote on the history of women and work still constitute important studies on the subject. This is because sources accessible to quantitative estimates have been difficult to identify for women's work in the eighteenth century, a time when women's occupations were only rarely specified in terms other than widow, spinster or servant, and when their contributions were not separated out from those of the head of household or family. It is unlikely, in the case of Britain at least, that we will ever resolve this debate at the level of the whole economy, but it may at least be addressed at the level of individual sectors, industries and regions.

Apart from assessing the impact of industrialisation upon women, it is also important that our understanding of industrialisation itself is determined by the gender division of the workforce. We can ask to what extent key features of the Industrial Revolution were determined by the characteristics of its labour supply. Recent research on the Industrial Revolution has emphasised slow, continuous change

and has found, for the industrial sector at least, that the productivity gain was much more limited than was once thought. The work of N. F. R. Crafts, Jeffrey Williamson, and Joel Mokyr has indicated relatively slow rates of growth, especially in the manufacturing sector. The evidence for these new estimates was based to a significant extent on the occupational distribution and wage trends of male labour.[5] These occupational trends, analysed further by E. A. Wrigley, reinforced views that most industry in the period experienced little growth or transformation.[11] Our current understanding of the Industrial Revolution is thus largely based on what we know of the occupational distribution and wage trends of male labour.

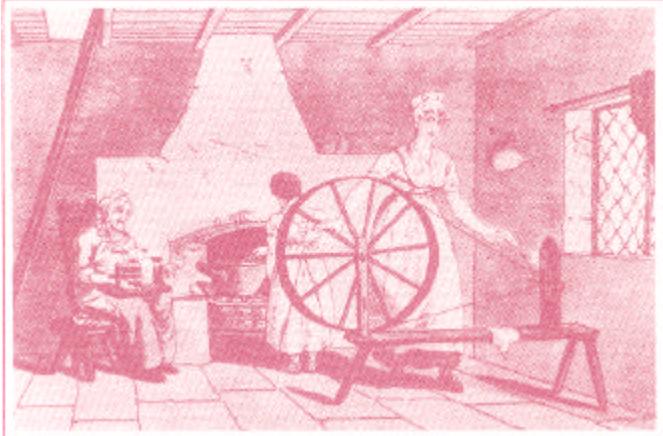
The typical industry which employed such labour has been described as traditional and small-scale, catering to local, domestic markets. Sixty per cent of the industrial workforce was locked in traditional industries with low levels of productivity growth. As late as 1831 only a small minority of the adult male workforce worked in high-productivity industries serving distant markets. The gains of these industries were thus offset; overall growth rates during the classic Industrial Revolution remained low. We can ask to what extent our assessment of the Industrial Revolution would change if we looked at the employment and income earning activities not just of men, but of women and children too.

Most of the debate on industrialisation and women's work has focussed on women in manufacturing, and this will necessarily be the case here. But it is first important to note that more women, in absolute numbers, were occupied in agriculture and domestic service during the eighteenth and early nineteenth centuries than in any other income-earning activity. Lindert and Williamson, whose social tables provide only extremely rough estimates of occupational distribution, found one in four families occupied in agriculture in 1759

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and one in seven by 1801/3. (General labouring was the work done by another one in seven of the population at both these times.)[5] Patrick Colquhoun estimated that there were 910,000 domestic servants in England and Wales in 1806; 800,000 of these were female. However, trends of female employment in these two sectors diverged in the course of the nineteenth century. [8]

Agricultural developments included a transition to more arable cultivation and to larger farms; these innovations resulted in the shedding of labour, with much higher proportions of female labour than of male labour disappearing. Women's traditional labour during the harvest and in dairying was curtailed over the course of the century. Male labour became concentrated at harvest time, and women's employment was increasingly confined to low-paid activities such as weeding, stone-gathering, hoeing and spreading manure. Proportionately fewer women were employed in dairying. This was because of trends to more arable cultivation, and also to bigger farms, as a result both of enclosure and of the amalgamation of farms. [1,10]



Women's Work: hand spinning at home

In contrast, women's employment in domestic service increased. A consensus exists that, from the later eighteenth century onwards, the occupation became feminised. One reason for this appears to have been the rising numbers of middle-class consumers. Certainly by 1851 there were large numbers of domestic servants. Servants accounted for one in ten of the labour force, and women outnumbered men by nine to one. But here too, available estimates are subject to large errors. Those who assembled data in some eighteenth-century surveys, and even in the 1851 census, failed to separate personal services either from work in husbandry or, even on occasions, from retailing and household manufacture. In both centuries there may, therefore, have been proportionately fewer occupied in personal domestic service than we now tend to assume.[8]

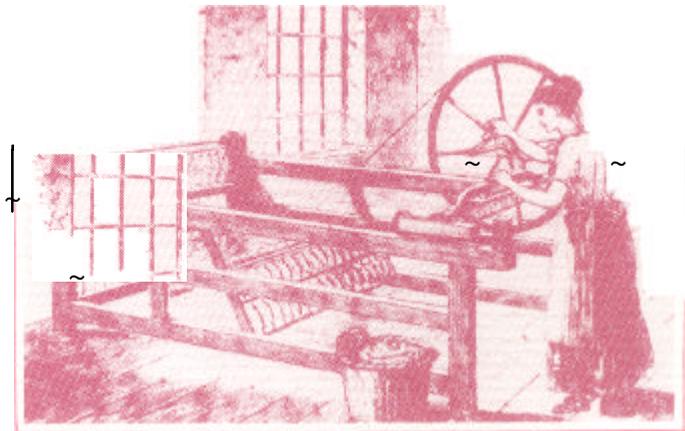
Explaining women's workforce participation

There have been varied explanations for the unequal and subordinate participation of women in the workforce. What has been lacking hitherto has been a detailed analysis of the specific historical conditions for women's entry into industrial work during the eighteenth century. Explanations for the special features of women's participation in industry must first be sought in the basic outlines of labour supply and demand. These were affected in turn by three factors: population change, institutional change (notably enclosure and the poor laws), and organisational and technological innovation.

Taking labour supply first, a new economic framework was provided by the contemporary growth in population, with its changed age and gender balances. Children aged 5 to 14 comprised approximately one-sixth of the population in the 1670s and one quarter in the 1820s. The labour of the young was thus an important potential resource and children earned their way at an early age, thus lowering

numbers dependent on adults. Gender ratios were skewed towards women for much of the seventeenth and eighteenth centuries. Women married late at this time, so that there were higher numbers of single women and widows in the population than in the early nineteenth century. [3,8] The average age at first marriage peaked at the age of thirty in the last half of the seventeenth century and stayed high until the later eighteenth century. Celibacy peaked in the 1670s and 1680s, and numbers of unmarried people was also high in the last half of the eighteenth century. Thus, the higher numbers of women than men in the population, and the higher proportion of women marrying late or not at all, meant that many women were seeking some means of gaining subsistence in the period. They created a ready pool of cheap labour. These were reinforced by large numbers of widows. Between 1574 and 1821 more than one in four households were headed by a single person, of whom widows accounted for one half. Substantial numbers of women needed to gain an independent subsistence, but in many cases, wages were pitifully inadequate or highly precarious. Our standard image of women working mainly within the context of the household or family economy is therefore a distorted one, if we apply it to the eighteenth century. [8,9]

Where women did work within a family economy, their earnings were very meagre, especially at times in their life-cycle when this was dominated by rearing small children. But even these limited earnings, if pooled within a family economy, could help to put together a subsistence. Among very poor families, all women and children who could find any work did it. Amongst those who were poor, but who could eke out a living, the earnings of the head of the household - rather than female market wages - provided the major determinant of female participation rates. This was another factor which contributed to new departures in female labour supply. Our evidence for wage trends in the industrial revolution hitherto has been based on the experiences of adult males. These trends have suggested stable or falling real wages until at least 1820, although there was also considerable regional variation. Low male wage rates - where family incomes were at stake - had the effect of encouraging high rates of female labour force participation.[9] For example, in eighteenth century Scotland, wage rates for male agricultural labour varied little, yet there is evidence that conditions for many families improved from the mid-seventeenth to the mid-nineteenth century. It is likely that such improvements came about, not through higher wage rates or more employment for males, but through more labour by women and children. [6]



A woman spinning on the Jenny

If trends in population and wages helped stimulate a new female labour supply in the eighteenth century then agricultural and institutional change, (especially enclosure) added considerably to this. Women's income-earning activities on the commons were sharply constrained by enclosure during the course of the eighteenth century. Enclosure cut out vital sources of subsistence in gleaning, wood gathering and gardening. It also drastically reduced the possibilities for both squatters and copyholders to pursue small trades and domestic industries which, on their own provided insufficient or

volatile returns, but with common rights could provide subsistence income. Other institutional changes, especially those in the poor law, increased difficulties in obtaining outdoor relief, housing and a settlement. These were all factors which had eased women's participation in the labour force earlier in the century. These institutional changes, when taken together with agricultural innovation, caused the classic 'release of labour' from agriculture that economists have shown to be necessary before the transition to modern economic development can take place. It is important to appreciate that the labour that was released was predominantly female.[1,10]

We can thus understand the historical origins of a rising female labour supply in the eighteenth century. But labour force participation must also depend upon labour demand. Labour demand was changing in conjunction with these supply factors. Current perspectives on the industrial revolution provide us with some initial clues to the emergence of a new demand for women's manufacturing labour during the eighteenth century. Recent quantitative research has uncovered an economy which was much more industrial than was once believed. Some of this was taken up with proto-industrial manufacturing [see Refresh 10] as well as new factory and capital-intensive industry in cotton textiles and iron. But much industry, it has been argued, was based in traditional, low productivity activity which served only local markets.[11]

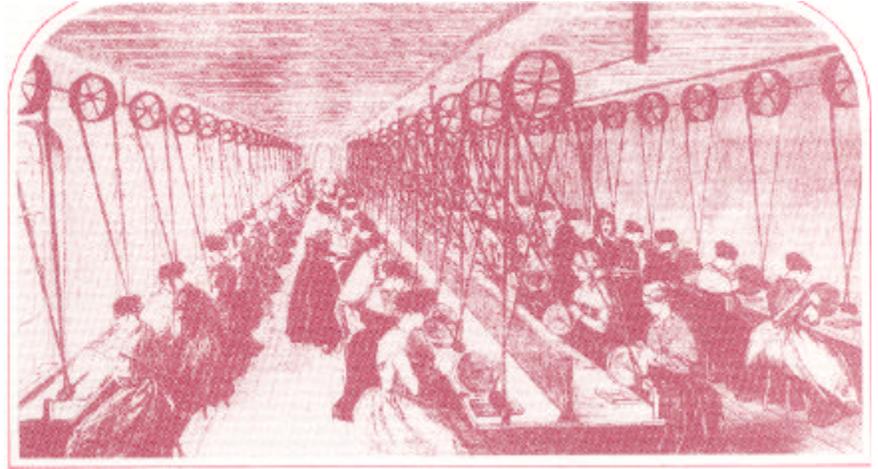
Women and Industrialisation

Analysis of the Industrial Revolution has centred mainly on the activities of an adult male workforce. It has been accepted that if most of this activity went to low productivity manufacturing, then the result for the economy was a low productivity industrial sector. But what of the activities of female and/or young workers? Their industrial contribution has not been adequately acknowledged. They were concentrated in proto-industrial activity and in the expanding branches of textiles, potteries, and - to a lesser extent - metal goods. To what extent have our views of the low productivity of British industry in the crucial years of the Industrial Revolution been distorted because we have been looking at the industrial distribution of the wrong workforce? It was the female, and not the male, workforce which counted in the most important high productivity industry of the period - textiles. Many of the proto-industrial manufactures had female workforces exceeding male by four, and even eight, to one. The textile industries formed the largest manufacturing sector in the eighteenth century, and women dominated all its major branches. In 1770 the woollen industry contributed nearly one-third of the value that was added by British industry; the proportions of men, women and children required to make 12 broadcloths were 14:17:27. In the Yorkshire worsted manufacture female spinners outnumbered wool-combers and weavers by three to one. The linen industry, accounting for one-twelfth of the value added by industry in 1770, and with respectable growth rates of 3.4 per cent in 1770-80, employed three or four spinners to each weaver. Silk accounted for 4 per cent of the value added in 1770, the same proportion as coal, and in silk 14 women and children were employed for each man. The trade in Spitalfields alone employed 4,000 at the time. Lacemaking was almost exclusively a female trade, and there were an estimated 140,000 in the trade in Buckinghamshire, Northamptonshire and Bedfordshire in 1780. Hand knitting occupied women, children and old men over many areas (such as the dales of the West and North Ridings, Westmorland, Cumberland and Scotland), even after the widespread use of framework knitting. Framework knitting, though carried out by men from early in the eighteenth century, relied heavily on the ancillary labour of women and children in seaming, finishing and winding. Increasingly over the eighteenth century, once apprenticeship regulations were bypassed, women and children also worked the frames.

Large numbers of women were also employed in the factories and

large workshops of the northern textile centres and midland metal manufactures and potteries. The few large textile factories in the eighteenth century employed roughly equal proportions of men and women, adults and children. Women were employed in even higher proportions in cotton mills by 1819, and made up at least three-fifths of the workforce in Scottish mills. [31]

The other main high productivity industry of the later eighteenth and early nineteenth centuries was the iron industry. We do not know much about employment in this industry before 1800, but that



Women pen grinding at Birmingham, *Illustrated London News*, 22 February 1851

it was predominantly a male occupation; is not in doubt. If we compare its industrial significance with that of textiles we find that it contributed much smaller proportions of value added in industry. In 1801, for example, it contributed only 7 per cent of added value compared to the 17 per cent of textiles. [5] And we need to pay attention to metal working industries in this context. These industries, including nail and chain making and the new Birmingham metal trades relied either on mixed family labour, or high proportions of women and children in domestic or large-scale workshops. Indeed, there was a typical division of labour between women and children making small chains and nails at home, and men who worked away from home in puddling and rolling mills. [4] For the Birmingham trades systematic employment data is available only from the nineteenth century, but this indicates a growing proportion of women and girls.[2]

Why were women employed?

The gender division of the workforce was clearly a major consideration in the demand for labour in manufacturing. Wage rates were one factor; women generally received one third to one half of the male wage. But there is little data on which to construct an index to show any kind of trend. There is, however, enough to indicate the differences amongst regions. High earnings for women in manufacturing were to be found in areas of the north and midlands where textiles, metalwares and potteries were expanding rapidly. In these areas women's wage rates were at least the equal of those received by local male agricultural labour. Moreover most of these occupations were gender segregated at least for time and place, so that there was no question of substituting female for male labour as wage differentials changed.

More important in explaining the demand for women's labour than wages was organisational and technological innovation. Women's labour was used to yield substantially higher rates of profit than was possible under earlier manufacturing regimes. Proto-industrialisation in some of its forms was associated with extensive division of labour, and putting out or other subcontracting arrangements. Larger-scale workshops and small factories could yield economies of scale even when there were as few as six to fifteen employees. This was because of a division of hand-performed tasks, the use of simple tools, better supervision, and a more disciplined work regime.

Such factories and workshops drew on higher proportions of female and child labour than their predecessors. [7]

In industries deploying large-scale production, such as the factory textile industry and paper making, more capital-intensive processes were associated to some extent with the substitution of women and children for men. It is interesting to see that women and children were assumed to be the key workforce in certain situations. For example, contemporary innovation in processes such as calico printing and spinning was tried out first on a female and child workforce. In situations of high-labour intensity, processes were broken down into a series of dexterous operations; these were performed particularly well by teenage girls who contributed manual skills learned at home. There is increasing evidence of single women and girls working in all-female households or workshops in such activities as lacemaking, calico printing, linen spinning and button manufacture, as well as in the better-known and more conventional factory arrangements in cotton manufacture or the potteries. Organisational innovation also tapped the supply of married women with children, thus developing a division of labour based on an adult with child assistants. Women workers in these early factories, workshops and proto-industrial manufactures were employed as they are in the Third World today. They were employed not because their wages were lower than those of local male labour, but because new methods of production could be introduced. These included management practices, divisions of labour and technologies which bypassed traditional artisan customs and arrangements.[3,4]

While high proportions of the labour force employed in manufacture were women and child workers, it was also evident that the employment provided by industry was insufficient. The demand for labour created by industry was not adequate to the task of soaking up surplus labour left in the wake of demographic and agricultural change. While factors affecting both labour demand and supply encouraged high rates of female labour force participation during the industrial revolution, the demand created for women's labour was not what models of economic development would predict. [1] To explain this, one area to which we must turn is the effect of technological innovation.

Impact of mechanisation

If we look at those industries affecting women, there is evidence of an eighteenth-century 'machinery question', one predicting the introduction of the big power technologies and large-scale factories of the nineteenth century. In the west of England the spinning jenny displaced 9 out of 10 warp spinners, and 13 out of 14 weft spinners. Silk-throwing machinery and Heathcoat's lace-making machinery destroyed traditional sources of women's domestic employment. The double engine loom, the jacquard loom, the flying shuttle, and framework knitting machinery displaced more. But other new processes in calico printing, the Birmingham trades, and the potteries drew on more women's labour. The spinning jenny and the power loom displaced women workers, but they were still themselves worked by women. When women's work in woollen spinning in Scotland went into decline it was replaced by flax spinning, then by flowering muslin or embroidery. [3]

Since we are hampered by the lack of quantitative indicators on women's employment for the early industrial period, there can be no resolution of the issue of mechanisation and women's work. But it seems probable that the opportunities afforded for women in the new sectors (which were still a relatively small part of industry in terms of value added according to current estimates) were not sufficient to offset the numbers of women displaced in agriculture and domestic spinning. The labour surplus economy which prevailed for men by the early nineteenth century also prevailed for women. Nevertheless, in terms of their proportionate contribution to the manufacturing labour force, women workers played a greater part over the whole course of the eighteenth century, than they had done previously and were to do in the later stages of industrialisation. While for the most part women's work in this period was low-waged and exploitative, where this work contributed to a family economy it made the difference between destitution and getting by. Where wages were higher

for women, there were some limited possibilities of gaining an independent subsistence, and in such cases single women did work independently or in groups outside the family economy. But such work was precarious, subject to fashion or to short-term cyclical trends or structural imbalances. It could support women as individuals, but did so generally for limited phases of the life cycle. By the mid-nineteenth century labour conditions historically specific to the Industrial Revolution had changed. As real wages rose, the proportions of occupied women fell at a rate of 0.7 per cent per decade over the last half of the nineteenth century. Other factors combined to reinforce this effect, notably a combination of factory legislation, the activities of male trade unionists and an increasingly pervasive ideology of the male breadwinner and of 'fit and proper' female activities. From levels recorded as high as the 67.5 per cent of married women working in Cardington in the 1780s, participation rates of married women in the whole country fell to 10 per cent in 1911.[9]

Gender and the Industrial Revolution

What impact does the recognition of women's employment have on our interpretation of the Industrial Revolution? Interpretations have so far been focussed mainly on data for adult male labour. The shift of labour away from agriculture would be reinforced with the inclusion of female labour. But the interpretation given to industry might be substantially altered by accounting for women's labour. The dominant parts of the manufacturing sector were employers of higher proportions of women than of men, and women rather than men were employed in the new progressive industries to which most of the productivity gain in industry has been attributed. We need to know the extent to which the sources of productivity gain which made the first Industrial Revolution can be found, in industry at least, in the deployment of a large female workforce with attributes of low wages, high labour intensity and discipline, and technical dexterity.

If we are ever in a position to answer this question, we may well find ourselves contemplating an Industrial Revolution which did achieve significant productivity gains, by employing women's and children's labour and by introducing the organisational and technological innovation which went with this: in other words, the Industrial Revolution as it was once familiarly understood.

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