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The end of destitution

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The End of Destitution

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July 2009

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ABSTRACT

The End of Destitution

The paper presents a statistical generalisation, to working families in the whole of Britain, of Rowntree's finding that absolute poverty declined dramatically in York between 1899 and 1936. We use poverty lines devised by contemporary social investigators and two relatively newly-discovered data sets. We estimate an almost complete elimination of absolute poverty among working households for the whole of the Britain between 1904 and 1937. We offer a number of pieces of corroborative evidence that give support to our findings. We decompose the poverty reduction into the effects of two proximate causes, of roughly equal importance, the decline in family size and the rise of real wages. We conclude with some speculation about the deeper causes of the decline.

JEL Classification: N3, O12

Keywords: poverty, living standards, Britain, demographic change, real wage growth

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The End of Destitution¹

1. Introduction

Discussion of poverty rates has often suffered but a lack of clarity in the distinction between absolute and relative poverty. Many argue that the right way to define a poverty line is relative to some measure of central tendency in a suitably equivalised household income distribution. In their discussions of British 20th century progress on poverty, Glennester *et. al.* (2004) and Piachaud (1988) persuasively argue for this relative position and indeed current British official and quasi-official measures of poverty or deprivation are mostly of the relative type. On the other hand, the World Bank, with a mission to relieve poverty, chooses an absolute standard, such as their ‘a dollar a day’ standard. When we take a long historical perspective a relative measure can create serious distortion, since it can mask, for instance, the massive improvement in living standards, for the poorest just as much as for everyone else, on almost any measure, that took place over the last one hundred years or so.

This paper offers evidence on changes in the incidence of absolute poverty among working households in Britain over the first forty years of the twentieth century. In his study of living standards in York in 1899, Rowntree (1901) defined a poverty line that he deliberately placed as close as possible to the brink of destitution; hence our title. Rowntree allowed only for the most basic diet and put in what he considered to be tiny allowances for clothing and other essentials. He found that 15.5 percent of the

¹ We thank Gemma Mills and Theresa Jennings for research assistance, the Nuffield Foundation for their Social Science Small Grant SGS/1220, which funded the digitisation of the 1904 data and Prof Peter Scott of the University of Reading, who kindly allowed us to use the 1937-8 data analysed in the paper. We also thank Robert Eastwood and Alex Moradi for stimulating discussions, seminar participants at the University of Sussex/Institute for Development Studies Development Economics Seminar and at the Economic History Society Annual Conference. The usual disclaimer applies.

people in working class households below this line. He reinvestigated poverty in York in 1936 (Rowntree, 1941) and when he applied his 1899 poverty standard, adjusted for price changes, the poverty rate had dropped to 6.8 percent.²

For his study of living standards in northern towns 1912-13, Bowley (Bowley and Burnett-Hurst, 1915) revised Rowntree's 1899 poverty line. He treated children a little less generously, but he also allowed a slightly better diet. Thus his poverty line was close to Rowntree's but not unambiguously more or less generous. Using this revised poverty line, Bowley estimated poverty in working-class households in 1912-13 and again in 1923-4. He found poverty rates of 5.4% in Stanley, rising a little to 6.4% in 1923-4, 7.6% in Northampton falling to 2% in 1923-4, 11.6% falling to 3.3% in Warrington and 20.4% falling to 8.1% percent in Reading (Bowley and Burnett-Hurst, 1915, Bowley and Hogg, 1925). The scale of the poverty reduction for working families over the period has not been heavily emphasised. This is partly because of the rise of unemployment in the interwar years, and partly because poverty studies of the period used different thresholds and were often difficult to compare.

In our recent study (Gazeley and Newell, 2009b), using newly-discovered data for 1904 in conjunction with Bowley's 'bare subsistence' poverty line, we estimate a headcount poverty rate of 21.7 percent among working households in United Kingdom. In this paper we estimate this rate to have fallen to 3.6 percent by 1937-38. It seems that the concentration of interwar social investigators (and subsequent

² He also used a significantly more generous 'human needs' poverty line and found 31.1 percent of working class households in poverty using this new standard.

secondary texts) on the link between unemployment and poverty masked this immense reduction in poverty experienced by working families.

What caused this reduction in a period of less than forty years which included the Great War and the Great Depression? Rowntree was clear that the principal causes of poverty in 1899 were low wages and large families. Death of the principal wage earner, ill health, unemployment and old age also played significant parts in creating poverty, but what stands out in Rowntree's original investigation is the preponderance of employed heads of households who could not provide adequately for their families. Bowley reached similar conclusions from his first survey of northern towns before the First World War. Suggestively, in their interwar studies, both investigators placed less emphasis than they had previously on low wages and large family size as causes of poverty. In these later studies, unemployment had become a major cause.

We investigate the proximate causes of the poverty reduction for working households over the period and ascribe equal shares of it to real wage growth on the one hand and changes in family size on the other. We also speculate on deeper causes. We should emphasise that we do not claim that all poverty was eliminated. Poverty due to old age, sickness, death of the principal wage earner and especially unemployment would all have persisted, and may have grown, between 1904 and 1938, but for those who stayed in work, the incidence of poverty fell substantially.

The rest of this article is set out as follows. In section 2 we discuss the definitions of poverty that we employ in this article. In section 3 we introduce the two household-level data sets that we use for our analysis. Because neither of these household

surveys are scientifically-designed samples, we also discuss how we adjust these data to be more convincingly representative of working households in the population. In Section 4 we describe the wage censuses that we use to adjust our poverty estimates to be more representative. In section 5 we present our results. In section 6 we present corroborative evidence on the reduction in family size and the rise of real wages, which strongly support the findings from the two household data sets. In section 7 we conclude with some discussion of the deeper causes of the reduction in destitution.

2. Defining poverty and destitution

What do we mean by destitution? We recognise that all measures of poverty are influenced by the social context, even those that utilise extrinsic standards of consumption behaviour (for example, dietary intakes based upon a scientific understanding of minimum physiological needs).³ Bowley's poverty line was aimed at defining the level of expenditure below which physical survival was seriously impaired. He adopted most of the assumptions embodied in Rowntree's earlier measure.⁴ Rowntree had devised a deliberately harsh measure of poverty that was comparable to standards of consumption experienced in Victorian workhouses. We prefer Bowley's poverty line, as his equivalence scale is better supported empirically by contemporary data (Gazeley and Newell, 2000).

³ See, for instance Townsend (1970) and Sen (1979).

⁴ See Rowntree (1901) for a discussion of what living at poverty-line income meant.

Interwar studies of living standards, mostly town or city studies, varied in the poverty line they applied, see Table 1, and so, as we have mentioned, their results are difficult to compare. In addition to the studies by Rowntree and Bowley, there were a large number of local poverty enquiries during the interwar years. Most of these regional enquiries used Bowley's 'bare subsistence' poverty line modified in various ways. Poverty among working-class households ranges between 21.3 percent in Southampton in 1931 and 6.9 percent in Bristol in 1937 (see Gazeley 2003:98).

Rowntree's third social survey of York, appears to show that poverty had more-or-less disappeared by 1950 (Rowntree and Lavers, 1951) and this finding was confirmed by the analysis of 1953-4 household survey data (Abel-Smith and Townsend, 1965).

Table 1 : Poverty among working-class households, 1899-1937

<i>Investigator</i>	<i>Date</i>	<i>Poverty-line</i>	<i>locality</i>	<i>Poverty (percent)</i>
Rowntree	1899	primary poverty	York	15.46
Bowley	1912-13	bare physical efficiency	northern towns	5.4-20.4
Bowley	1924	bare physical efficiency	northern towns	3.9-11.3
Llewelyn-Smith	1929-30	modified Booth	London	9.1
Caradog Jones	1929-30	modified Bowley	Merseyside	16.0
Owen	1931	modified Bowley	Sheffield	15.4
Ford	1931	modified Bowley	Southampton	21.3
Rowntree	1936	human needs (version 2)	York	31.1
Rowntree	1936	primary poverty	York	6.8
Tout	1937	modified Bowley	Bristol	6.9
Tout	1937	George	Bristol	10.7

Source: adapted from Gazeley (2003)

Table 2: Poverty line equivalence scales by Bowley and George (Bowley couple =100)

	<i>Bowley</i>	<i>George</i>
Couple	100	115
Additional adult	43	48
Child aged 14-16	39	48
Child aged 6-13	26	40
Child aged under 6	19	30

Source: R.F. George (1937).

Notes. (1) To simplify presentation, we take an average of the male and female expenditures. (2) Bowley's allowance for a couple cost 15s 4d at 1936 prices.

In Table 2 we present the Bowley equivalence scale that we shall employ, and well as a more generous scale suggested by George (1937). During the interwar years many investigators revised, upwards, Bowley's and Rowntree's standards, as living standards rose. These revisions partly reflect the tension between the relative and absolute poverty concepts. George (1937) re-formulated Bowley's requirements, in line with the British Medical Association recommendations with respect to minimum food requirements. Satisfying these new recommendations increased the poverty-line cost of food for all family types.⁵ In what follows, we employ Bowley's and George's definition to examine the time path of poverty between the turn of the twentieth century and the beginning of the Second World War. These two poverty-lines provide simple lower and upper bound measures for how contemporaries defined poverty over the course of two generations. Our approximations to the equivalence scales embodied in Bowley and George's poverty line measures are set out in Table 2, where it can be seen that George's line is more generous for all individuals, but especially so for infants.

⁵ See George (1937) p.91 Bowley's standard was especially inadequate compared with BMA recommendations, with respect to milk consumption.

3. Household Expenditure Surveys

Although there was a large number of poverty enquiries carried out in Britain before and after the First World War, none of them attempted to provide a national picture. There were a few household expenditure surveys, however, that collected data suitable for the analysis of poverty and attempted to provide national coverage. These are set out in Table 3, with details of the number of households taking part and the proportion of the original returns recovered.

Table 3: Household Expenditure Surveys of the United Kingdom, 1890-1938

<i>Year</i>	<i>Organisation</i>	<i>No. budgets</i>	<i>No. recovered</i>	<i>Remarks</i>
1890-1	United States Commissioner of Labor	1,024	1,024	Non-random sample of export trades carried out by Carroll Wright.
1904	Board of Trade	1,994	1,021 (also includes some budgets not included in published report)	Non-random sample of wage-earners used to derive expenditure weights for the Ministry of Labour Cost of Living index, including Eire. (aggregate results published as Cd. 2337)
1918	Sumner Committee	1,306	zero	Re-application of 1904 BoT survey in order to investigate changes in food consumption resulting from the First World War (aggregate results published as Cd 8990)
1937-8	Ministry of Labour	10,762	623 (urban workers)	Working-class Cost-of- Living Enquiry, reported in Ministry of Labour <i>Gazette</i> December 1940, January & February 1941 (includes agricultural workers). Stratified random sample from NIS register, plus representative earning <£250

The first of these was carried out by Carroll Wright, the United States Commissioner of Labor in 1890-91. We initially proposed to employ this survey in this study. The households taking part in the survey were located in eight manufacturing export industries: pig iron; bar iron; bituminous coal; coke; glass; cotton textiles and woollen textiles. Szreter (1996) describes how the families of textile workers, about one-third of the USCL sample, tended to have much smaller families than others. For example, cotton workers' families had, on average 2.1 children in USCL, while steel workers' families had on average 2.7 children. Thus the USCL data contains too limited a sample industrially to represent the wage distribution, but crucially it is also composed of a very non-representative group of families, and could not be employed here.

The Board of Trade undertook the first large-scale national expenditure survey of urban households in the United Kingdom in 1904 and its design and execution embodied much of what had been learnt in the previous recent smaller scale Board of Trade enquiries.⁶ The survey was repeated in 1918, using the same questionnaire, as part of the Sumner Committee's investigation of the impact of WW1 on the cost of living of working class households, but none of the 1,300 returns from this later enquiry are known to have survived. In 1937-8 a more extensive national survey was undertaken by the Ministry of Labour. The purpose of these enquiries was to ascertain weights for the official cost-of-living index. Because of this, both surveys focussed on collecting expenditure records from working-class households where the head of

⁶ Wilson-Fox had collected a smaller number of agricultural workers' household expenditure records in 1902. The report of this survey was published as Cd. 1761 and provides details of the consumption of food of 114 agricultural labourer's families collected by Wilson Fox in 1902. Cd. 1761 also report includes the results of the Labour Department of the Board of Trade undertook a survey of about 400 urban working families in 1903. 286 of these families provided returns, 88 of which were sufficiently detailed to provided for the analysis of food expenditures. 68 of these were from London and the suburbs.

household was working. In 1937-8, the Ministry of Labour commissioned a separate complimentary survey of middle-class expenditure patterns.⁷ The 1904 survey was exclusively urban in focus, whereas the 1937-8 Ministry of Labour survey also collected expenditure records from households where the head of household was employed in agriculture.⁸

The 1904 enquiry collected details of household income, rent and food expenditure from workmen's families in the British Isles (including southern Ireland), recorded for one week between July and September 1904. A total 2,283 returns were collected via workmen's organisations, co-operative societies and individuals, though only 1,994 were deemed to be useable.⁹ The degree to which it is representative of the urban population needs to be established. Some aggregate statistics derived from the 1904 enquiry were published as Cd 2337 in 1905.¹⁰ Until recently, it was believed that the original returns from this enquiry had been destroyed, but about half (1,021) are extant. Gazeley and Newell (2009b) compare various statistics of the surviving sample with the aggregate published results for the entire survey and they find that the surviving sample is biased towards Scotland, Ireland and Northern England. Other biases, such as differences in family size and in income and expenditure are minimal.

12,967 working class household expenditure records were collected for the week beginning 17 October 1937. These were collected from a target stratified random

⁷ Massey's middle class survey

⁸ Number of agriculture budgets in 1937-8 and Wilson Fox had already collected and analysed the expenditure records of rural workers households at the turn of the century.

⁹ *Ibid* Cd 2337 1905 p.3.

¹⁰ The enquiry made use of a fixed format questionnaire. The forms provide information on locality (often given very precisely); number and age of children; occupation of the head of household; household weekly income, including earnings of the head and average additional weekly family income; weekly house rent and number of rooms occupied. Fully half the questionnaire is concerned with expenditure and quantity of food consumed by the family, but no details of non-food expenditures were requested other than rent.

sample of about 22,000 households with a currently- employed head earning less than £250 per annum.¹¹ The target sample was mostly drawn from the unemployment insurance register, but was supplemented by households where the head of household was not currently insured against unemployment (particularly railway workers, local authority and public utilities employees and those employed by government departments).¹² The Ministry of Labour set rules to ensure national coverage.¹³ A separate complimentary enquiry was carried out by the Women’s Institute on behalf of the Ministry, where the head of household was employed in agriculture.¹⁴

The full survey was repeated for single weeks in each of January, April and July 1938. The subsequent quarterly investigations for the three weeks in 1938 produced, respectively 11,518, 11,126 and 10,920 useable household budgets. The total number of households supplying expenditure records for all four weeks of the enquiry was 10,762.¹⁵ Of these, 623 are extant (about 5.8 percent) and their October 1937 records have been digitised.¹⁶ This small number of surviving returns appears to have very similar characteristics to the full sample. In Tables 4, 5 and 6 we compare the ‘surviving 600’ returns with the analysis of the entire sample collected by the Ministry of Labour. As can be seen, the ‘surviving 600’ are a very good approximation of the

¹¹ Approximately 31,000 households were identified and visited, but about 9,000 were found by the enquiry investigators to fall outside the scope of the enquiry. TNA LAB 17/7 99338, p.7

¹² TNA LAB 17/7 99338 p 5

¹³ For example, to ensure that all regions were adequately covered the Ministry required that it received responses from households amounting to at least two-fifths of the total number of households in random sample from any district. If less than this were received, further questionnaires were sent to households on a reserve list in the under-represented district. Indeed the sample mirrored the regional distribution of the insured workforce almost exactly. *Ibid*, p.5

¹⁴ *Ibid* p.7

¹⁵ TNA LAB 17/7 99338 p.8

¹⁶ 524 of these are extant at the University of Bangor and 99 at TNA under LAB 17. These surviving returns were digitised under the supervision of Prof. Peter Scott of the University of Reading and we are extremely grateful to him for making the extracted data from available to us.

entire sample with respect to regional coverage, the size distribution of households and the distribution of children.

Next we compare the distributions of total household expenditure in the surviving sample with that given for the random sample of 2225 that was used for analysis in TNA LAB 17/7 99338. Table 7 gives a comparison. The key point to emphasise here is that the surviving sample has a much greater proportion of low expenditure households than the random sample.

Table 4: The regional distribution of households in the ‘surviving 600’ and in the full 1937/8 survey

<i>Percentage shares of households by region</i>	<i>Surviving 600</i>	<i>Full Survey</i>
London and South-East	30.2	25.7
South-West	10.0	8.7
Midlands	11.2	14.3
North-East	12.8	12.9
North-West	15.1	14.4
North	5.1	6.4
Wales	3.7	4.8
Scotland	5.8	11.0
Northern Ireland	3.0	2.9

Source, own calculations and TNA LAB 17/7 99338, page 64.

Table 5: The size distribution of households in the ‘surviving 600’ and in the full 1937/8 survey

<i>Percentage shares of households by number of people in the household</i>	<i>Surviving 600</i>	<i>Full Survey</i>
One	2.2	2.0
Two	18.5	20.9
Three	26.2	27.7
Four	23.0	22.9
Five	16.1	13.6
Six	6.9	6.2
Seven	4.2	3.5
Eight	1.4	1.6
Nine	1.0	0.8
More than nine	0.7	0.8

Source, own calculations and TNA LAB 17/7 99338, page 11.

Table 6: The distribution of children in households in the ‘surviving 600’ and in the full 1937/8 survey

<i>Percentage shares of households by numbers of children present</i>	<i>Surviving 600</i>	<i>Full Survey</i>
Zero	44.3	47.0
One	27.6	25.9
Two	15.7	15.4
Three	7.1	7.0
Four	3.9	2.9
Five	0.3	1.1
Six	0.6	0.5
Seven	0.2	0.1
Eight	0.3	0.1

Source, own calculations TNA LAB 17/7 99338, page 11.

Table 7: The distribution of total expenditure among households in the ‘surviving 600’ and in the full 1937/8 survey

<i>Percentage shares of households by total expenditures in shillings</i>	<i>Surviving 600</i>	<i>Random sample of 2,225</i>
Under 40	8.5	2.8
40 and under 50	9.2	5.9
50 and under 60	13.7	10.3
60 and under 70	13.0	15.7
70 and under 80	13.5	14.7
80 and under 90	9.5	12.8
90 and under 100	6.8	9.5
100 and under 110	6.1	7.7
Over 110	19.8	20.6

Source, own calculations TNA LAB 17/7 99338, page 80

4. Contemporary Wage and Earnings Censuses

The retrieved samples from both the 1904 Board of Trade survey and the 1937-8 Ministry of Labour survey are selected from the original survey in a partially understood non-random way. Superimposed on that problem is another; we cannot assume, for reasons set out above, that either of the original surveys were effectively randomised and thus potentially representative. However, there are near-contemporaneous Board of Trade and Ministry of Labour wage and earnings censuses.

In Section 5 we employ these wage census data to reweight our estimates of poverty rates from the two surveys. We discuss the re-weighting in section 5 and describe these wage censuses here. Appendix Table 1 provides a summary of these, noting their timing and coverage.

The Board of Trade conducted the first wage census of employers in Britain in 1886. This was followed by a similar enquiry by the Labour Department in 1906.¹⁷ After the First World War, the Ministry of Labour undertook a number of surveys of earnings and hours.¹⁸ In addition, the Ministry carried out another survey in 1938, but the results were not published until 1943. All these enquiries were voluntary and are generally restricted to data relating to one week in the month of the survey.¹⁹ Bowley claims that the early surveys exclude out-workers and those working in small workshops, as well as the industries named in Table 8.²⁰ They were carried out with the full co-operation of the National Confederation of Employers' Organisation and it is likely, therefore, that the survey focussed on larger employers who were affiliated to the employers' federation. Given that it is more-or-less universally found that larger employers tend to pay better wages (see for instance Oi and Idson ,1999) the likely bias of the omissions is to reduce the frequency of earnings that are lower in the distribution.

¹⁷See Bowley (1937), p 100-106 for a full discussion.

¹⁸1924 published June 1926-Sept 1927, 1928 published October-December 1929, 1931 published January-March 1933, 1935 published February-July 1937.

¹⁹The 1924 enquiry was actually conducted in 4 separate weeks in January, April, July and October 1924. The reports published in 1926 and 1927, present separate details of earnings in these 4 weeks as well as average figures. The 1928 enquiry is restricted to one week in October 1928 and makes comparison with the October figures for 1924. The 1931 and 1935 surveys collected information on earnings and hours for one week in October, but also data on numbers employed for a different week in October and the total wage bill for 1930. This information was required to compliment the Census of Production. See *Gazette*, January 1933, p.8

²⁰Bowley (1937) p100

In 1938 113,000 forms were issued and 74,500 were completed (about 66%).²¹ It distinguished between adults and juveniles (males over 21 years, youths and boys 16-20, women over 18 years, girls less than 18 years), but does not distinguish between earnings in large and small firms (based on numbers employed). In terms of employment, several important industries are excluded, including agriculture, coal mining, railway service, shipping, port transport and dock labour, distributive trades, catering, entertainment, commerce and banking and domestic service. Among these omitted industries are those that are traditionally low-paying (agriculture, catering) and high-paying (mining, commerce and banking), so the direction any bias to the wage distribution is unclear. The October 1938 survey covered about 5.5 million workers and stands as the culmination of the experience gained by the Ministry of Labour during the interwar period.²²

5. Poverty estimates 1904 and 1937

In this section we present our estimates of poverty among working households from the 1904 and 1937 data sets. All poverty rates fall heavily over the 33 years between the two surveys. We also discuss various aspects of our estimates: for instance, changes in the composition of the poor and sources of bias.

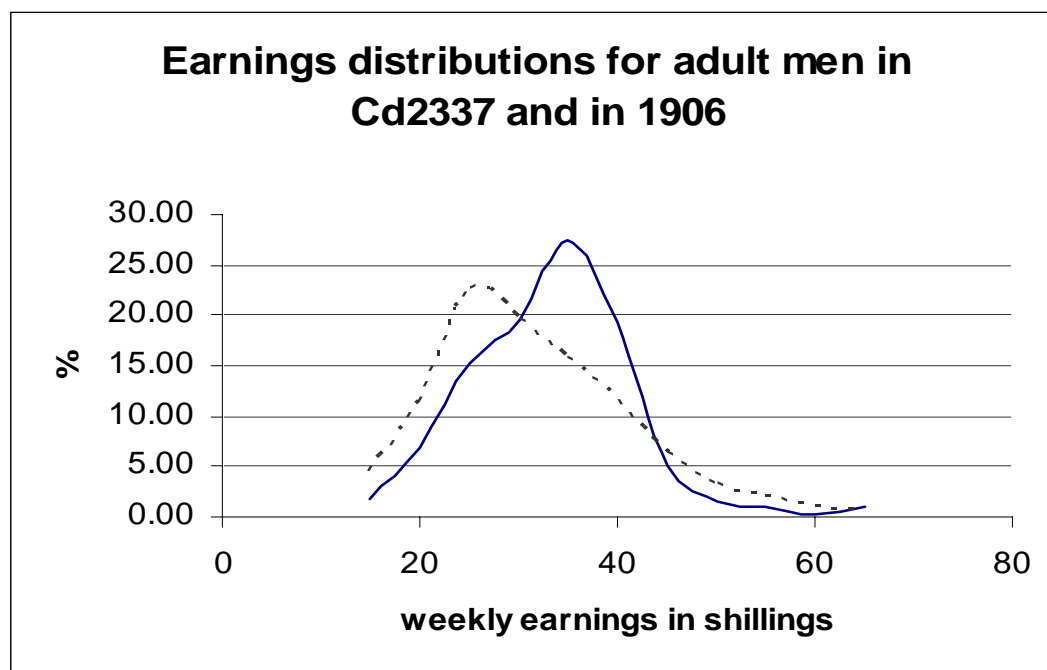
Gazeley and Newell (2009b) calculated that Bowley's 'bare subsistence' poverty line generated a poverty rate among working households in our 1904 data set of 12% and a 15.5% headcount rate. However, when considering these rates as potential estimates of national poverty, Gazeley and Newell acknowledged various sampling biases, the

²¹Gazette, January 1933, p.8

²² See 'The Case for the Enquiry' PRO file LAB 17/135

most important source of which was the over-sampling of households headed by skilled manual workers, leaving too few households with less-skilled heads.

Chart 1: Wage frequencies in the 1904 household data and the 1906 wage census



Source: Gazeley and Newell (2009b)

This is illustrated in Chart 1, which plots the frequency distribution of head of household's earnings from the surviving 1,000 (solid line) returns from Cd 2337 in 1904 and the earnings distribution for adult men derived from the 1906 wage census (dotted line).

Since, as noted above, the 1904 survey only asked questions about income and food expenditure, we compare household weekly income net of rent with the appropriate adult-equivalent poverty line in order to calculate poverty rates. In the last four lines of column 1 in Table 9 we present the unadjusted poverty rates generated by applying the Bowley and George poverty lines to the data. In the final two columns of the table

we give poverty rates for households where the head's weekly wage falls into each of the wage brackets. In the second column we give the male full-time wage frequencies in the 1906 earnings census. In the last four lines of the second column, in italics, we present rates constructed by re-weighting the poverty rates by the wages census frequencies, which are, of course quite a lot higher than the unadjusted rates.

Table 9: 1904 Poverty rates, raw and adjusted using 1906 earnings distribution

<i>Wage in shillings</i>	<i>% frequency among heads of households in 1904</i>	<i>% frequency among adult male workers in 1906</i>	<i>Bowley poverty rates (%)</i>	<i>George poverty rates (%)</i>
<15	1.9	4.7	53	65
15 and <20	6.9	11.5	57	73
20 and <25	15.3	22.7	27	47
25 and <30	19.7	19.6	11	30
30 and <35	27.5	15.7	3	12
35 and <40	19.3	11.6	1	6
40 and <45	5.0	6.3	0	4
45 and <50	1.4	3.3	0	0
50 and <55	1.1	1.9	0	0
55 and <60	0.3	1.0	0	0
60 and <65	1.1	0.7	0	0
>65	0.6	1.1	0	0
<i>Poverty rates</i>	<i>Unadjusted</i>	<i>Adjusted</i>		
Bowley headcount	15.5	21.7		
Bowley household	12.1	17.9		
George headcount	29.4	35.8		
George household	24.0	30.8		

Source: Gazeley and Newell (2009). Sample size=892. For reference, the standard error of an estimated poverty rate lies between 1 percent and 2 percent for samples between 500 and 1,000. If, for comparison with the 1937 data, we exclude the Irish cases, the poverty rates either remain unchanged or fall by very small amounts. For instance the unadjusted and adjusted Bowley household poverty rates become, respectively 11.9% and 17.9%.

This adjustment, which is to make our poverty estimates more representative, only works if the households of workers in each wage bracket in the 1904 survey can be taken to be representative of UK households with heads whose earnings are in that wage bracket. The other main bias in these data is the over-representation of Scottish households and the under-representation of households in London and the south-east

of England. This could bias results if wages, prices or family sizes were differently distributed in Scotland. However, as Gazeley and Newell (2009a) show, Scottish cities had wages and prices very similar to those prevailing in the South of England. Indeed the two regions were similarly placed in the national wage distribution of the period. Gazeley and Newell (2009a) also show that there is no difference between Scotland and the rest of Britain in terms of the main parameters of the distribution of family size. Our estimates of poverty rise when we adjust for under-sampling of low-wage families. We estimate greater levels of destitution than found by Rowntree in York in 1899 and by Bowley in most of his towns 1912-13.

Thirty-three year later on, after the Great War and the macroeconomic instability of the 1920s and early 1930s the next national survey of living standards was undertaken, starting in 1937. We employ the surviving 1937 data to estimate destitution among working families in Britain. No income is recorded among these households but expenditures are very carefully recorded, so in this case we compare non-rent expenditures with the appropriate adult-equivalent poverty line to estimate poverty incidence. Our approach to re-weighting is similar to that described above.

Since we have only a small fraction of the original data, we use the adult male wage distribution from the 1938 earnings survey to re-weight the sample. In the last four rows of the first column of Table 10 we give unadjusted poverty rates. In the final two columns of Table 10 we give estimated poverty rates for households with different levels of expenditure. The wage frequencies from the 1938 wage census are given in the second column of Table 10, and the wage-frequency adjusted poverty rates are given in the last four lines that column. In this case the wage adjustment actually

lowers the estimated poverty rates. This is perhaps surprising, since we had expected the frequency of lower incomes to be higher than the frequency of lower expenditures.

To illustrate how the adjustment fails to raise estimated poverty we present the frequencies of expenditures in the first column of Table 10. Critically there is a smaller percentage of men recorded as receiving wages under forty shillings per week in the wage census, than there is of households spending less than forty shillings in the surviving 1937 household survey records. There are two possible explanations for this. Firstly the 1938 wage census excludes agricultural workers, who were mostly poorly paid, but the 1937 survey does not exclude the households of these workers. Secondly, the 1937 survey does not exclude households headed by women. Again, women's pay was much lower than men's pay at the time²³. The inclusion of female-headed households would, as with agricultural households, raise the frequency of low-spending households. The big result, though, is more-or-less unaffected, since whether we adjust or not, we find very little Bowley poverty among working families in 1937 data.

We estimate household poverty to have been about 3 percent in the surviving 1937 household expenditure survey records using Bowley's standard and about 5 percent using George's poverty line. However, when we re-weight our estimates using the frequency distribution from the 1938 earnings census, they are reduced to about 2 percent and 3 percent depending on which poverty line is used. Our results suggest that the elimination of destitution among working families was almost complete by the late 1930s.

²³ For instance Ainsworth (1949, p4) shows that three-quarters of women who worked 44 hours or more per week earned less than forty shillings per week.

Table 10: 1937 poverty rates, raw and adjusted using 1938 wage survey

<i>Weekly expenditure or earnings level in shillings</i>	<i>Share of households with this level of expenditures in 1937 survey</i>	<i>Percentage of men aged over 21 with this level of earnings</i>	<i>1937/8 Bowley poverty rate</i>	<i>George poverty rate</i>
<40s	8.5	6	22.6	28.3
40 and <50s	9.2	8.3	3.5	9.3
50 and <60s	13.7	18.5	0.6	2.1
60 and <70s	13.0	21.7	0	0.7
70 and <80s	13.7	19.8	0	0
80 and <90s	9.5	12.1	0	0
90 and <100s	6.7	6.5	0	0
100 and <110s	6.1	3.2	0	0
110 and <120s	3.7	1.8	0	0
Over 120	9.6	2.1	0	0
<i>Poverty rates</i>	<i>Unadjusted</i>	<i>Adjusted</i>		
Bowley headcount	3.6	1.8		
Bowley household	2.7	1.8		
George headcount	6.5	6.6		
George household	4.6	3.0		

Notes and sources. 1. The poverty rates in the first column are calculated using the full sample (N=591). For single-earner households (N=340) the household poverty rates, using Bowley's and George's poverty lines are 2.8% and 5.3% respectively.

This rather bold statement is supported by a noteworthy aspect of poverty in the 1937 dataset. In this survey there is a question about days of work supplied by the household in the reference week. All the heads of household were employed. About 75% of all heads of household said they had worked either 5.5 or 6 days. But just under 11% of all households in the sample supplied, in total, less than 5.5 days of work in the reference week. Among the few Bowley-poor households, this fraction was 57%. Thus a large fraction of those we measure as poor are households in which for one reason or another, for instance sickness or temporary layoff, a full week of work has not been supplied. This may well have affected the spending plans of these follows that some part of measured poverty in this survey is likely to be temporary in nature.

How much credibility we should give our finding of large-scale poverty reduction, since it derives from two relatively small sub-samples from original surveys? We have re-weighted our sub-samples using the approximately contemporary wage surveys. If this was sufficient to render the samples representative, then we could infer, for instance, that the estimated fall of over 9 percentage points in the Bowley household poverty rate was significantly different from zero ($t = 6.5$) and assert with 95% confidence that the fall is between 6.6 and 12 percentage points.

A second question is whether we are comparing like-with-like. In particular, we use household data on income net of rent from the 1904 sample and household expenditure net of rent for the 1937 sample. This difference is caused by the lack of many categories of non-food expenditure data for 1904 and a lack of income data for 1937. It is possible that consumption-smoothing behaviour might exaggerate the fall in measured poverty between the two samples.²⁴ We develop an alternative, common method on the two samples to overcome this possible difficulty. Both surveys record food expenditures in detail, so we take the food element of Bowley's poverty line²⁵ and adjusted it for changes in food prices 1904 to 1937, and then measured the proportion of households spending less than their Bowley food allowance. In this way we measure poverty in exactly the same way in the two samples. We find a household food poverty rate of 10.7% in 1904, which rises to 15.0% if re-weighted by the 1906 wage distribution. We find a food poverty rate of

²⁴ Note, however that many respondents in 1904 made it clear they were reporting their normal weekly earning, rather than their actual earnings.

²⁵ Bowley's food allowance for a man aged 18 or more was 4s 6d. Setting this to 100, he allowed 90 for adult women, 85 and 80 for young men and women respectively aged 16 and 17, 85 and 70 for boys and girls respectively aged 14 and 15, 50 for children aged 5 to 13 and 33 for children under 5 years old Bowley and Burnett-Hurst (1915, page 80).

3.5% for 1937, which falls to 3.0% if re-weighted by the 1938 wage distribution. This exercise confirms the suspicion that the income data for 1904 generate greater poverty rates than expenditure data would, but the difference is quite small and the reduction in poverty over time is almost as large as we found earlier, so this bias accounts for no more than a small fraction of the fall in poverty.

Next we check if our result could be due to shifts in the relationship between family size and income between the two samples. Could it be, for instance, that the reduction in family size was heavier among lower-earning families? We find that the reduction in family size is more-or-less uniformly distributed over households grouped by food expenditure per capita, see Table 11. We also examine the extent to which differences in recorded poverty rates may have been influenced by the preponderance of secondary workers between the 1904 and 1937 household expenditure surveys. Table 11 shows that the proportions of secondary workers are almost identical across different income groups in the samples, except for a rise in the share of single-worker families among the low-spending families.

Table 11: Average family size and the preponderance of secondary workers in 1904 and 1937/8

<i>Households in percentiles of the food expenditure per capita distribution</i>	<i>Household size</i>		<i>Proportion with only one worker</i>	
	1904	1937/8	1904	1937/8
Lowest decile	7.3	5.5	.55	.71
Between 10 th and 25 th percentile	6.8	4.6	.62	.63
Between 25 th and 50 th percentile	6.2	4.1	.60	.52
Between 50 th and 75 th percentile	5.5	3.7	.52	.46
Between 75 th and 90 th percentile	4.9	2.9	.51	.51
Highest decile	4.0	2.5	.56	.60
Full sample	5.8	3.9	.56	.55

Source: authors' calculations from 1904 and 1937 survey returns.

Table 12 shows that the fall in family size between 1904 and 1937 derives from falls in numbers of people at all ages, but especially of younger children. Average household size had fallen by nearly two persons, from 5.8 in 1904 to 3.9 in 1937. We investigate the extent to which this fall was responsible for the reduction in poverty in the next section.

Table 12: Household structure and food expenditure in 1904 and 1937 compared

<i>Average Household statistics</i>	<i>1904</i>	<i>1937</i>
Number of children under 6	0.9	0.4
Number of children aged 6 to 13	1.3	0.6
Number of people aged over 13	3.6	2.8
Number of people	5.8	3.9
Food expenditure per capita in 1904 prices.	45.5 pence	58.7 pence

Source: authors' calculations from 1890, 1904 and 1937 survey returns.

Note how the average number children under 14 in a household fell by 1.2 between 1904 and 1937. Real *per capita* food expenditure grew about 30 percent between 1904 and 1937, which we will see is in line with the growth of real wages over the period. We conclude from this section by stating that it seems to us that there were two proximate forces driving the *per capita* income distribution among working households between 1904 and 1937: real wage (i.e. economic) growth and falling household size, and these two forces were the main proximate determinants of the fall in poverty among working households. We do not find evidence that the fall in poverty is likely to be associated with either changing work patterns within households or by differential shifts in family size across income groups.

6. Corroboration of the poverty reduction from other sources of data

In this section we present evidence on the changes in family size and in the distribution of wages from sources other than the 1904 and 1937 household surveys.

6.1 Changes in household size.

The Sumner Committee of 1918 (Cd 8980:14) reports the average family size for manual workers in 1917, as 5.6 persons, of whom 3.2 people are over 14 years, 1.6 are aged between 6 and 14 years and 0.8 are children under 6 years. This is very similar to the pattern evident in the surviving returns from the 1904 enquiry and suggests that the reduction in family size took place later than 1917. The statistics presented in Table 13 are consistent with this hypothesis, and show how the largest part in the fall in completed family size in the period occurred between marriages started 1900-1909 and marriages started 1915-1919.

Table 13: The total fertility rate by marriage cohort 1900-1929.

<i>Date of marriage</i>	<i>Average completed family size, manual heads</i>
1900-09	3.94
1910-14	3.35
1915-19	2.91
1920-24	2.73
1925-29	2.49

Table derived from the *Royal Commission on Population*, (1948-9) Table XXV, page 29. Data based on the Family Census of Great Britain, 1946.

It seems the decline in family size in this period was a speeding up of a longer-term process. The causes of this kind of shift in of slow-moving aggregate phenomenon are always hard to pin down. In the 1949 Report of the Royal Commission on Population, the main discussion focussed on: (i) the impact of economic growth, in particular the increase in job opportunities for women and the raised ability of householders to provide for their own old age; (ii) the changing nature of work and the introduction of compulsory education, which changed the costs of raising children. The apparent speeding up of the trend through the Great War has been explained as a diffusion of the technology of birth control, see discussed by Winter (1986, p271) who argues as follows:

'It is possible the distribution of rubber sheaths among soldiers in the First World War, as a protection against venereal disease, helped popularize contraception among some men. The wartime increase in female employment, which required substantial internal migration, may have exposed more women to currents of opinion or propaganda favourable to contraception. But whatever the source, it is clear more couples were using contraceptives after the war than before it. In a survey conducted for the Royal Commission on Population after the Second World War, Lewis-Faning found that while 16 percent of women married before 1910 said they used birth control during their married life, fully 41 per cent of those married 1910-1919 and 59 per cent of those married in 1920-4 did so.'

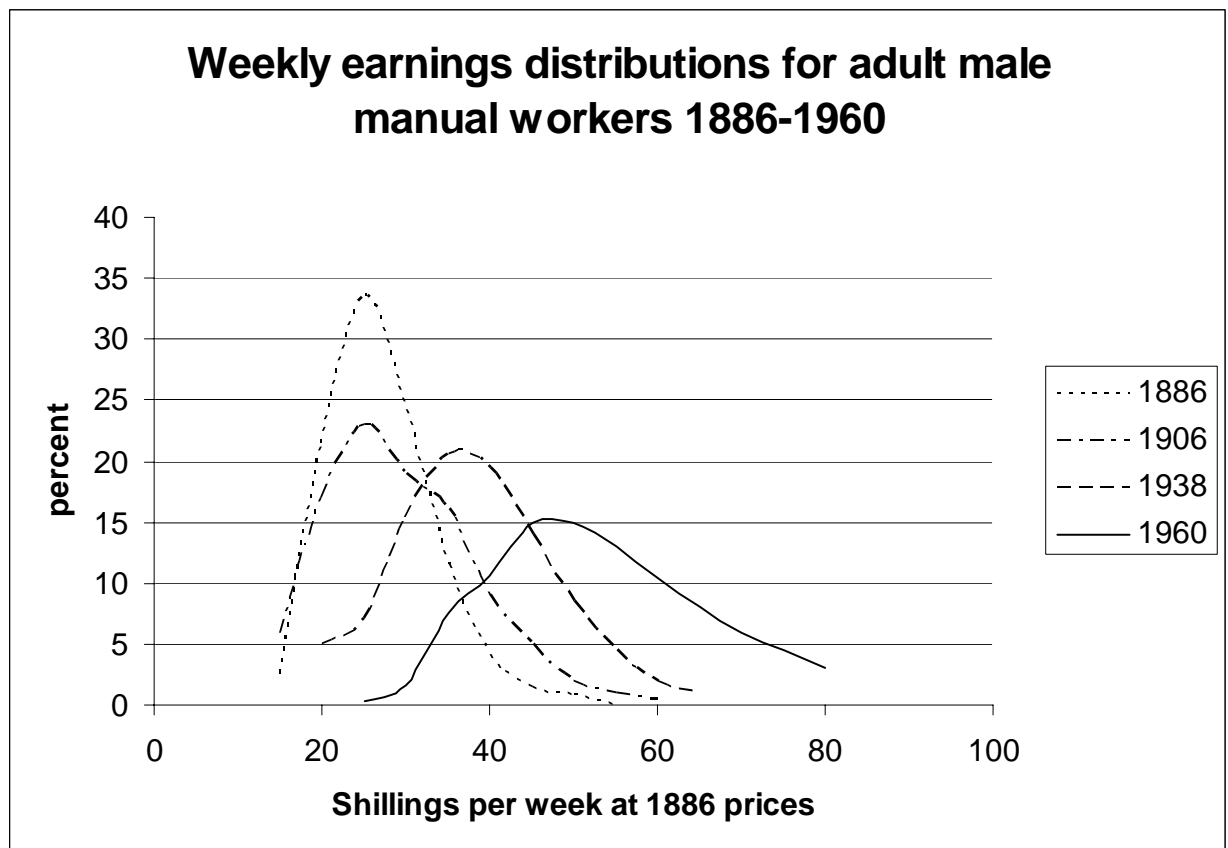
Thus, according to Winter, a side effect of WW1 may have been that it acted as a massive family planning programme in reducing unwanted fertility during a long-term fertility transition. It seems such events may well have occurred more recently in developing countries, see Bongaarts (1997) for instance. This hypothesis is supported by the fact that the data are not consistent with the widespread adoption of two other forms of family limitation: late marriage and wider birth spacing. . We know (Winter, 1986, p261) that the age of marriage for women fell if anything after WW1. Among families with two or more children in our data sets, the increase in birth spacing is too small to account alone for such a large fall in family size. We estimate the gap between first and second child rises by 4 months ($t = 1.8$) on average between the two surveys while the gap between second and third child rises 8 months on average ($t = 2.4$).

6.2 Changes in the wage distribution

To discuss shifts in wages we compare the distributions of wages in across wage censuses. Chart 2 compares real weekly wage distributions for adult men, 1886 to 1960. All are converted to 1886 shillings. The Bowley poverty line for a typical family was just under twenty 1886 shillings (£1) in both 1886 and 1906. The graph in Chart 2 illustrates that twenty shillings cuts off a large fraction of the tail of the adult

male weekly wage distribution in both years. In the 1886 and 1906 wage censuses respectively 24 and 16 percent of adult men earned less than a pound. By 1938, however, not only had wages risen substantially in real terms (on average by 10s at 1886 prices (30%), but also, because family size fell over the period, the Bowley line for the typical 1938 family falls by one-third, to about 13s at 1886 prices. The 1938 wage census records no weekly earnings at or below that level for adult men.

Chart 2: Weekly Earnings Distribution 1886-1960



Sources: 1886: ;1906:British Parliamentary Papers (1909a, 1909b,1910a, 1910b,1911, 1912-13b,1912-13c); 1938: Ainsworth (1949); 1960 BLSHA?. All four curves are derived from grouped data. Deflated by the cost of living index for the ONS website.

Table 14: Descriptive statistics of the distributions of male full-time manual weekly wages 1906-1960

	<i>sd log wages</i>	<i>Coefficient of variation of wages</i>	<i>Mean real wage</i>	<i>Annual growth rate between dates</i>
1906	0.31	0.31	107	0.4%
1938	0.27	0.26	137	0.9%
1960	0.26	0.25	195	1.9%

Notes and sources, see Chart 2.

Ainsworth (1949) provides comparative distributional data for full-time workers from the 1906 and 1938 wage surveys. His calculations are taken from more detailed sources than ours and his results differ a little, but the main picture is the same. Deflating his results we find he calculates a 30% real increase in the average weekly wage for full-time men, with declining wage inequality. For his evidence on inequality see the last column of Table 15, which shows lower-quartile wages growing much faster than average wages.

Table 15: Descriptive statistics for male full-time manual weekly wages on normal hours 1906 and 1938 (1906 mean = 100)

	<i>1906</i>	<i>1938</i>	<i>1938/1906</i>
Lower quartile	72.4	107.2	1.48
Median	92.7	128.5	1.39
Mean	100.0	130.4	1.30
Upper quartile	119.5	148.7	1.24

Source, Ainsworth, 1949, p39, deflated to 1906 prices, see Chart 2 for details. .Data exclude mine workers.

Our wage distribution data are taken from reports that give grouped data, and so they do not allow us much detail of the shapes of the lower tail of the earnings distribution, so we cannot use study the possible impact of changes in the shape on poverty. If we simulate the distribution, we can make progress, though. If we assume a log-normal statistical model for men's wage, we can simulate the impact of a changing mean or variance on the position of any particular wage in the wage distribution. In addition,

we can calculate the wage that is required to support an averaged-size family at the Bowley poverty threshold for each of our wage survey dates. By measuring the 1906-38 shift in the mean real wage, the smaller decline in wage variance and the shift in the Bowley poverty threshold real wage we can attribute the reduction in poverty between its proximate determinants: real wage growth, declining wage variance and changes in family size. We find a simulated fall in the proportion of wages below the poverty threshold from 20 percent in 1906 to just over 2 percent in 1938, which is reassuringly similar to the estimated falls in poverty we found in the household survey data sets. We estimate that about half of the shift that caused the near-elimination of Bowley-poverty among working households in the period is due to real wage growth plus a smaller effect from the decline in wage inequality, and about one-half of the shift is due to the fall in family size.²⁶

We have characterised the change in the wage distribution over the period as a rise in the mean wage and a reduction in dispersion, with the former being more important for the fall in poverty. It is likely the deeper causes of these shifts operated on both parameters. Nevertheless the rise in mean real wages suggests that our initial discussion should be of the medium-term sources of productivity growth. Matthews, Feinstein and Odling-Smee (1982, p31) show that labour productivity growth was very slow, around half of one percent prior to 1924, but sped up significantly to about

²⁶ Here is the reasoning. Since the shift in family size and the rise in real wages happen simultaneously, we cannot apportion the fall in the poverty rate proportionally to each cause. We can, however separately calculate the falls in the proportion of below-poverty wages for (a) changes in the wage distribution and (b) changes in family size, by using a lognormal wage distribution. The 50-50 split we find comes from these calculations. If we change the parameters of the wage distribution and leave the poverty threshold constant, the wage poverty rate falls to about 5%. If we then leave the wage parameters constant and simply reduce the poverty line wage by one-third, again the wage poverty rate falls to 5%. If we make both changes simultaneously the wage poverty rate falls to just about 2%. Thus the simulated fall in wage poverty is due to shifts in the wage distribution and changes in family size in roughly equal measure. Note finally that the fall in wage variance has a relatively minor simulated effect, at about one-tenth of the effect of the rise in the mean wage.

one percent a year 1924-1937. Feinstein (1972, Table 9, pT26 and Table 59, pT129) shows that manufacturing, transport, and insurance, banking and finance were the sectors with highest labour productivity growth 1924-1937. Manufacturing was the largest of these accounting for about one-third of all employment in Britain by 1937. Within the sector, there was very rapid productivity growth combined with rapid expansion of employment in vehicle production and electrical engineering. These new industries barely existed before WW1 but accounted for almost a million jobs by 1937. They were at the heart of the waves of technological change that saw the application of general purpose technologies like the internal combustion engine and the electric motor to huge ranges of products and processes.²⁷ These innovations raised productivity and, via increases in labour demand, real wages in aggregate.

On changes in wage inequality, we first note that skill differentials fell, especially during and after WW1. Prior to the war, the differential between unskilled and skilled workers in Britain had been stable for at least 500 years. In the building trade in southern England from 1410 until 1914, for example, the craftsman as paid half as much again as the labourer (Phelps Brown, 1979 p.6). As the labour market fluctuated over time, both the rate for labourer and craftsman varied with the economic cycle, but the relativity remained constant. Before the First World War, time rates were customarily negotiated locally. The 'district rate' as it became known, was jealously guarded by the old craft unions. All this changed with the First World War, which undermined customary rules established with the 'authority of generations' (Phelps Brown, p.6). Average money wages doubled during the five years of war and the

²⁷ See, for instance, Mowery and Rosenberg (1998).

majority of these advances were brought about by flat-rate cost-of-living bonuses that undermined the traditional differential between skilled and unskilled adult male work.

During WW1, trade union membership nearly doubled from about 25% of the workforce to 48% between 1914 and 1920 (Bain and Price 1980). Collective bargaining was promoted by the Ministry of Labour as a means of regulating increases in pay arising from wartime inflation. During 1917 there was a *de facto* move to national wage agreements in many manufacturing industries as '...wages of a large proportion of British workers were prescribed by government decree' (Sells, 1939 p.26). In most industries, this move signalled a more formal shift to national bargaining and settlement, as wages were indexed to prices. This process of wage equalisation was augmented by the action of statutory authorities that specified minimum wages under the Whitley Councils and Trades Boards in the immediate post-WW1 period. Knowles and Robertson (1951) found that the adult male unskilled-skilled wage-rate ratios, in five industries (engineering, shipbuilding, building, railways and police) narrowed from about 50-60 percent in 1914 to about 80-85 percent in 1920.

In addition, the Unemployment Insurance Act 1920 extended the coverage of the 1911 National Insurance Scheme, so that roughly 2/3rds of all manual workers were insured. The level of benefit payments was generous (roughly 60 percent of average wages) when compared with prevailing wage-rates, further acting to underpin the gains in wages secured by unskilled workers during the War.

7. Conclusions

Our headline is that the elimination of destitution among working families was almost complete by the late thirties, earlier than previously thought and well before the Welfare State reforms of the post-WW2 government. We perform a simulated decomposition of the fall in poverty between 1906 and 1938, and this attributes about half of the poverty reduction to real wage growth, with a minor role for declining wage inequality, and about half was due to the fall in household size. The fall in household size is almost all a fall in the numbers of children present. There is an increase in birth spacing, but the big change in numbers of children is too big to simply be the result of this change. The widespread adoption of contraception during the period seems to have been the means of achieving a desired reduction in family size. We repeat once again that our findings only relate to working households and we leave unanswered questions about changes in poverty due to old age, sickness and unemployment etc.

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Appendix Table 1: Wage and Earnings' Census of the Board of Trade and Ministry of Labour

<i>Year</i>	<i>Number of male workers (except * which is 'all workers')</i>	<i>Data</i>	<i>Remarks</i>
1906	1.9m	Distribution of weekly earnings of manual workers: men over 21	Excludes coal mining, railways, agriculture (includes Eire). No general report ever published. Distribution of male earnings derived from aggregating distribution by industry from each report.
1938	5.5m*	Distribution of weekly earnings of manual workers: men over 21	All employers with >10 workers & random sample of 1:5 of all those with <10 workers (excludes coalmining & agriculture)

Notes: 1906: British Parliamentary Papers 1909 (Cd.4545) *Report of an enquiry by the Board of Trade into the Earnings and Hours of Labour of Workpeople of the United Kingdom, Textile Trades in 1906*; British Parliamentary Papers 1910 (Cd.5196) *Report of an enquiry by the Board of Trade into the Earnings and Hours of Labour of Workpeople of the United Kingdom, Part IV, Public Utility Services in 1906*; British Parliamentary Papers 1911 (Cd.5814) *Report of an enquiry by the Board of Trade into the Earnings and Hours of Labour of Workpeople of the United Kingdom, Part VI, Metal Engineering and Shipbuilding Trades in 1906*; British Parliamentary Papers 1909 (Cd.4844) *Report of Departmental Committee on the Checking of Piece-work Wages in Dock Labour; Part II. Clothing Trades in 1906*; British Parliamentary Papers 1910 (Cd.5086) *Report of an enquiry by the Board of Trade into the Earnings and Hours of Labour of Workpeople of the United Kingdom. Part III. Building and Woodworking Trades in 1906*; British Parliamentary Papers 1912-13 (Cd.6053) *Report of an enquiry by the Board of Trade into the Earnings and Hours of Labour of Workpeople of the United Kingdom. Part VII. Railway Service in 1907*; British Parliamentary Papers 1912-13 (Cd.6556) *Report of an enquiry by the Board of Trade into the Earnings and Hours of Labour of Workpeople of the United Kingdom. Part VIII. Paper, Printing, &c., Pottery, Brick, Glass and Chemicals Food, Drink and Tobacco; and Miscellaneous Trades*; 1938: 5.5m represents 70% of industries covered, based on figure for men, women, girls and boys. Separate totals are not recorded (see Ainsworth, R.B., *Journal of the Royal Statistical Society* (A), Vol. 112 (1949) p.49).

