

## STUDIES IN THE DECLINING BIRTH-RATE, ENGLAND AND WALES

1. THE NORTHERN COUNTIES
2. SUMMARY OF RESULTS FOR ALL AREAS

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(With 2 Maps)

THE trend of fertility in Wales and the Southern and Midland counties of England was demonstrated and discussed in the previous sections of this enquiry.<sup>1</sup> The corresponding vital statistics for Northern England are given in the present concluding section and, in addition, the results that have been found are briefly reviewed for the country as a whole. For the Northern counties the same methods have been employed as in the two previous sections. Briefly, the actual birth-rate has been measured by the number of births per 1000 married women aged 15-45, while as a rough assessment of how far a changing age distribution of married women has affected its level, a potential birth-rate and fertility ratio have also been calculated. The potential birth-rate gives the number of births per 1000 married women aged 15-45 obtained by applying Tait's fertility ratios 48·75, 41·25, 30 and 15 to the number of married women in the age groups 15-19, 20-24, 25-35 and 35-45 respectively. The fertility ratio is the ratio of the actual to the potential birth-rate.

### 1. NORTHERN COUNTIES

#### *Fertility*

The rates for the counties in this division are shown in Table I. As the number of married women aged 15-45 was not given in the census of 1901 for the three divisions of Yorkshire separately, the rate has to be given for Yorkshire as a whole at this point of time. In six of the nine counties the highest actual birth-rate was recorded in 1870-2. The exceptions were Westmorland and the West Riding with their maximum in 1860-2 and 1850-2 respectively, and Lancashire where the birth-rate of 1850-2 was equal to that of 1870-2. Each county shows an unbroken decline from 1870-2 onwards. At each triennium there is considerable variation in the actual birth-rates of the

<sup>1</sup> *J. Hygiene*, **36**, 402-37 and **37**, 188-224.

Table I. *Northern England. Legitimate birth-rates per 1000 married women, aged 15-45*

County	1850-2			1860-2			1870-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Yorkshire:									
East Riding	264	260	102	277	260	107	282	262	108
North Riding	301	251	120	302	253	119	314	258	122
West Riding	305	263	116	288	261	110	293	263	111
North-western counties:									
Cheshire	277	260	107	283	258	110	292	258	113
Lancashire	297	262	113	284	262	108	297	262	113
Northern counties:									
Durham	305	266	115	313	268	117	324	271	120
Northumberland	294	258	114	302	260	116	313	264	119
Cumberland	299	253	118	300	254	118	312	256	122
Westmorland	304	248	123	312	249	125	306	253	121

County	1880-2			1890-2			1900-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Yorkshire:									
East Riding	275	262	105	258	258	100	228	256	89
North Riding	306	261	117	275	256	107			
West Riding	273	260	105	249	257	97			
North-western counties:									
Cheshire	286	257	111	267	255	105	230	251	92
Lancashire	285	260	110	264	257	103	234	254	92
Northern counties:									
Durham	308	268	115	299	267	112	283	264	107
Northumberland	300	260	115	290	261	111	267	261	102
Cumberland	310	258	120	289	254	114	257	249	103
Westmorland	300	251	120	267	244	109	219	240	91

County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Yorkshire:									
East Riding	206	249	83	188	247	76	142	247	57
North Riding	220	249	88	196	247	80	144	247	58
West Riding	186	246	76	170	244	70	116	244	48
North-western counties:									
Cheshire	186	242	77	166	239	69	116	240	48
Lancashire	193	245	79	177	241	73	123	241	51
Northern counties:									
Durham	242	256	95	226	255	89	154	249	62
Northumberland	219	251	87	203	250	81	137	245	56
Cumberland	218	245	89	205	244	84	143	243	59
Westmorland	186	237	78	166	234	71	124	243	51

County	County boroughs								
	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Yorkshire:									
East Riding	210	252	83	198	250	79	146	249	59
North Riding	237	257	92	228	254	90	164	251	65
West Riding	176	245	72	166	244	68	112	244	46
North-western counties:									
Cheshire	220	247	89	173	240	72	126	240	53
Lancashire	202	247	82	186	242	77	133	243	55
Northern counties:									
Durham	234	252	93	226	253	89	158	248	64
Northumberland	217	249	87	212	250	85	144	246	59
Cumberland	—	—	—	206	244	84	136	242	56
Westmorland	—	—	—	—	—	—	—	—	—

A. = Actual birth-rate; P. = Potential birth-rate; F.R. = Fertility ratio.

Table I (continued)

County	Urban districts								
	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Yorkshire:									
East Riding	181	239	76	142	239	59	122	240	51
North Riding	218	250	87	180	247	73	135	245	55
West Riding	186	247	75	167	243	69	115	244	47
North-western counties:									
Cheshire	167	242	69	160	239	67	108	240	45
Lancashire	176	244	72	160	240	67	106	239	44
Northern counties:									
Durham	244	258	95	227	255	89	153	250	61
Northumberland	226	256	88	202	253	80	133	246	54
Cumberland	219	248	88	210	246	85	147	244	60
Westmorland	172	238	72	150	234	64	111	242	46
County	Rural districts								
	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Yorkshire:									
East Riding	207	244	85	188	242	78	139	243	57
North Riding	204	239	85	182	238	76	135	243	56
West Riding	223	250	89	199	247	80	139	249	56
North-western counties:									
Cheshire	181	237	76	164	236	69	115	240	48
Lancashire	184	239	77	165	235	70	111	237	47
Northern counties:									
Durham	249	259	96	225	258	87	150	249	60
Northumberland	200	245	82	174	238	73	123	238	52
Cumberland	216	240	90	199	243	82	143	242	59
Westmorland	196	236	83	181	235	77	135	244	55

A. = Actual birth-rate; P. = Potential birth-rate; F.R. = Fertility ratio.

counties, the difference ranging from 36 births per 1000 married women aged 15-45 in 1860-2, to 64 births in 1900-2. The highest actual birth-rate in each triennium was that of Durham, except in 1880-2 when the rate for Cumberland was slightly above the Durham value. Cheshire and the West Riding had low rates throughout the period under review. In the division of Yorkshire the actual birth-rate of the North Riding was the highest in seven of the eight triennia for which the rates are given. In the majority of counties the potential birth-rate reached its maximum in 1870-2, but in Cheshire the potential rate was highest in 1850-2 and the potential rate for North Riding and Cumberland increased steadily up to 1880-2. In the last triennium the range of the potential birth-rate was only one-half that recorded in the previous eight triennial periods. Durham had the highest potential birth-rate in each of the nine periods and the rate for Westmorland was low. In the first periods the populations of married women in East and West Riding were more favourably constituted for a high birth-rate than in North Riding, but, in spite of this, the North Riding showed the highest actual rate. The fertility ratio for Durham was below that of North Riding, Cumberland and Westmorland during the first four periods, and this suggests that the high birth-rate of Durham

during this period was due to a favourable age constitution of married women rather than to a higher actual fertility. For the last periods the fertility ratio followed a similar trend to that of the actual birth-rate.

For the last three triennia, when division into county boroughs, urban and rural districts was possible, the actual birth-rate of the county boroughs was, generally, higher than the rate of the urban and rural areas, but there were some exceptions, and the West Riding was the only area in which the rural rate was highest and the county borough rate lowest in each of the three periods. No striking differences are shown between the rates of decline during the twenty years but, with the exception of Cheshire, the county boroughs showed a slightly smaller percentage decline than the other two areas. The highest actual birth-rates and potential birth-rates in each triennium were those of the North Riding in the county boroughs and Durham in its urban and rural areas.

To illustrate the trend of the birth-rates more readily they were expressed as a percentage of the rates for 1870-2 and the results are shown in Table II. During the 60 years, 1870-2 to 1930-2, there was a decline of 49.6 per cent in the actual birth-rate in the East Riding where the percentage decline was least, and 60.4 per cent in the West Riding, where the decline was greatest. The potential birth-rate meanwhile fell by only 4.0 to 8.1 per cent. The percentage decline in the actual birth-rate was not constant over the period under review and the counties where the birth-rate declined slowly in the first periods showed a greater rate of decline in the last triennial periods. For the division as a whole the decline in the last 20 years was just over two-thirds of the fall that took place in the previous 40 years. Variation in this respect may be illustrated by the trend in Durham where the decline in the actual birth-rate in the last 20 years, 1911-32, was actually greater than that for the first 40 years, 1870-1913; on the other hand, the decline in Westmorland in 1911-32 was only one-half of that of the first 40 years. These counties had the lowest and highest percentage decline, respectively, during the period 1870-1913. Durham in the most recent years has made up for its earlier maintenance of a high fertility.

Table II. *Legitimate birth-rates as percentages of those of 1870-2*

County	1850-2			1860-2			1870-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Yorkshire:									
East Riding	93.6	99.2	94.4	98.2	99.2	99.1	100.0	100.0	100.0
North Riding	95.9	97.3	98.4	96.2	98.1	97.5	100.0	100.0	100.0
West Riding	104.1	100.0	104.5	98.3	99.2	99.1	100.0	100.0	100.0
North-western counties:									
Cheshire	94.9	100.8	94.7	96.9	100.0	97.3	100.0	100.0	100.0
Lancashire	100.0	100.0	100.0	95.6	100.0	95.6	100.0	100.0	100.0
Northern counties:									
Durham	94.1	98.2	95.8	96.6	98.9	97.5	100.0	100.0	100.0
Northumberland	93.9	97.7	95.8	96.5	98.5	97.5	100.0	100.0	100.0
Cumberland	95.8	98.8	96.7	96.2	99.2	96.7	100.0	100.0	100.0
Westmorland	99.3	98.0	101.7	102.0	98.4	103.3	100.0	100.0	100.0

A. = Actual birth-rate; P. = Potential birth-rate; F.R. = Fertility ratio.

Table II (*continued*)

County	1880-2			1890-2			1900-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Yorkshire:									
East Riding	97.5	100.0	97.2	91.5	98.5	92.6	—	—	—
North Riding	97.5	101.2	95.9	87.6	99.2	87.7	—	—	—
West Riding	93.2	98.9	94.6	85.0	97.7	87.4	—	—	—
North-western counties:									
Cheshire	97.9	99.6	98.2	91.4	98.8	92.9	78.8	97.3	81.4
Lancashire	96.0	99.2	97.3	88.9	98.1	91.2	78.8	96.9	81.4
Northern counties:									
Durham	95.1	98.8	95.8	92.3	98.5	93.3	87.3	97.4	89.2
Northumberland	95.8	98.5	96.6	92.7	98.9	93.3	85.3	98.9	85.7
Cumberland	99.4	100.8	98.4	92.6	99.2	93.4	82.4	97.3	84.4
Westmorland	98.0	99.2	99.2	87.3	96.4	90.1	71.6	94.9	75.2
County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Yorkshire:									
East Riding	73.0	95.0	76.9	66.7	94.3	70.4	50.4	94.3	52.8
North Riding	70.1	96.5	72.1	62.4	95.7	65.6	45.9	95.7	47.5
West Riding	63.5	93.5	68.5	58.0	92.8	63.1	39.6	92.8	43.2
North-western counties:									
Cheshire	63.7	93.8	68.1	56.8	92.6	61.1	39.7	93.0	42.5
Lancashire	65.0	93.5	69.9	59.6	92.0	64.6	41.4	92.0	45.1
Northern counties:									
Durham	74.7	94.5	79.2	69.8	94.1	74.2	47.5	91.9	51.7
Northumberland	70.0	95.1	73.1	64.9	94.7	68.1	43.8	92.8	47.1
Cumberland	69.9	95.7	73.0	65.7	95.3	68.9	45.8	94.9	48.4
Westmorland	60.8	93.7	64.5	54.2	92.5	58.7	40.5	96.0	42.1

A. = Actual birth-rate; P. = Potential birth-rate; F.R. = Fertility ratio.

### Occupations

Agriculture was not an important source of occupation in several of these counties of Northern England. Westmorland, with 32.1 per cent of its occupied males engaged on the land in 1921, was the only agricultural county. Cumberland, North and East Riding, with 17.4, 17.1 and 15.2 of the males thus employed, had, however, an important proportion of land workers. The percentage of agricultural workers in the other counties ranged from only 2.5 to 9.1.

The mineral resources of this division were varied and important, and included coal, iron, slate, lead, granite, limestone, salt, etc. The proportions of occupied males engaged in mining and quarrying, in 1921, in Durham, Northumberland, Cumberland and the West Riding were 33.8, 22.9, 18.8 and 15.0 per cent respectively. Although mining and quarrying only gave employment to 6.8 per cent of the occupied males of Lancashire, in 1921, this occupation was important in the southern section of the county and several districts had over half the males employed in coal mines.

Metal workers formed the most important occupational group in Northern England, for over 630,000 males were so employed in 1921. The production of iron and steel formed an extensive branch of this industry in Yorkshire. Rather more than half of the 30,039 metal workers enumerated in the North Riding were returned from Middlesborough where they formed 35 per cent of the occupied males. In the West Riding the industry showed a less localized

character and Sheffield with 38 per cent had the largest proportion. Durham and Northumberland were sites of manufacture of heavy goods and consequently a smaller proportion of female to male workers was recorded in these two counties than was generally found in other counties. The later stages of metal manufacture rather than the primary production of the metal was carried on in Lancashire and Cheshire. In Yorkshire, Cheshire, Durham and Northumberland the metal workers were engaged in shipbuilding in certain well-known areas.

The textile industry was an important source of employment in Lancashire, the West Riding and Cheshire. In 1921 the percentages of occupied males were 11.3, 10.4 and 5.9 respectively, whilst the percentages of females were 38.0, 33.6 and 21.1. The numbers of women engaged in this industry to 100 men, in these three county areas, were 173, 133 and 160. The industry in Cheshire was situated in the Eastern districts which resembled the adjacent portion of Lancashire, and were in fact a continuation of this latter area. Along the Lancashire border of the West Riding cotton weaving was carried on. The Lancashire textile areas could be subdivided roughly into spinning and weaving districts but the Yorkshire textile areas were not similarly divisible. An interesting feature of the textile industry was the relatively large numbers of married women operatives. This practice of remaining at work after marriage was more common than in other factory occupations.

Finally large numbers of males were employed on water transport services. These were returned mainly from the county boroughs and were concentrated in a few areas. Thus, of the 57,578 males following this occupation in Lancashire, 74 per cent were found in Liverpool and Bootle, and of the 15,623 males in the East Riding 14,971 were enumerated at Hull.

#### *Districts within the counties*

It is not proposed to review the birth-rates in the districts within the Northern counties prior to 1911, since this was done in great detail by Dr E. M. Elderton.<sup>1</sup> She found that the birth-rate had declined in all districts, the fall being more pronounced in the textile towns, where there was much employment of women, than in the metal working or mining districts. The male workers in the metal and mining industries were better paid than those in the textile trades; in the latter the women's wage was an essential factor in the household economy and an additional birth not only increased the expenditure but removed for a greater or less time one source of income. This financial consideration was probably a prime factor in the greater restriction of the size of family in the textile areas as compared with the mining and engineering districts. Dr Elderton reached the following conclusions (p. 215):

“(1) That the fall in the birth-rate has been most marked where women are industrially employed.

<sup>1</sup> *Report on the English Birth-Rate. Part I. England, North of the Humber, Eugenics Laboratory Memoirs, nos. 19, 20. London, 1914.*

“(2) That restrictions placed on female labour have not decreased the number of women employed although there are no data to show the effect on the number of married women employed.

“(3) That the number of married women now employed in factories is so considerable that any tendency on their part to restrict motherhood would undoubtedly be a sensible factor in the fall of the birth-rate in textile districts.

“(4) That young persons between the ages of 10 and 15 were far less frequently employed in 1901 than in 1871, but that there was practically no change in the numbers employed between 1851 and 1871.

“There is thus definite evidence of the recent loss in economic value of the child in the textile districts, and these districts also are chiefly those in which women are industrially employed.”

Dr Elderton considered that the fall in the birth-rate was to a certain extent a natural fall after the extremely high level of the early 'seventies, but even when normal conditions had been reached the fall continued.

The only district in the Northern counties which did not show a fall in the birth-rate before 1901 was Liverpool, but in the early periods this district had a rate below the average. A comparison between the old registration district of Liverpool and the recent administrative district shows a continuous fall since 1901 although the rate remained high, about 50 births per 1000 married women aged 15-45 above the rate for the whole county for each triennial period 1911-13, 1920-2 and 1930-2. The birth-rates for this district were:

1861	1871	1901	1911-13	1920-2	1930-2
221	250	255	238	229	177

The very large crude birth-rate of 32.3 per 1000 population was recorded in the last triennium for the dockside ward of Exchange, this was twice as large as the corresponding rate for England and Wales. The high birth-rate of Liverpool is probably maintained by the Irish section of its population which is predominantly Roman Catholic.

The birth-rates are given for broad occupational groups of urban districts in Table III for the last three triennial periods 1911-13 to 1930-2. There were several districts in most of the Northern counties in which the most important male occupational group was commerce and finance, clerks, etc. In Yorkshire, Cheshire and Lancashire these areas were adjacent to large cities, some were probably of suburban residential character; the others appeared to be the centres of distribution rather than production. These districts were grouped under the heading of commercial districts. As indicative of metal working, mining and textile districts the criterion taken was the employment of at least 30 per cent of the occupied males in each occupation in 1921. In several of the large ports the principal male occupations were those connected with water transport and these towns have been grouped under ports. Areas with no predominant occupational group were placed under "other" districts. These occupational groups exhibited appreciable differences in their fertility. The birth-rates in the metal working, mining and port districts greatly exceed those



of the commercial, textile and "other" districts. The differences between the occupational group with the lowest birth-rate and the group with the highest,

Table III. *Northern England. County boroughs and urban districts.*  
*Legitimate birth-rates per 1000 married women, aged 15-45*

Administrative county	1911-13	1920-2	1930-2
<b>Commercial districts:</b>			
Yorkshire	154	120	110
Cheshire	153	137	98
Lancashire	139	101	88
Durham	—	—	—
Northumberland	128	103	84
Cumberland	189	187	130
Westmorland	173	150	108
Northern England	147	115	96
<b>Metal-working districts:</b>			
Yorkshire	212	185	124
Cheshire	183	163	117
Lancashire	216	186	127
Durham	242	230	163
Northumberland	237	236	145
Cumberland	215	203	137
Westmorland	—	—	—
Northern England	219	197	135
<b>Mining districts:</b>			
Yorkshire	243	206	139
Cheshire	—	—	—
Lancashire	233	201	134
Durham	248	222	145
Northumberland	238	212	137
Cumberland	238	226	159
Westmorland	—	—	—
Northern England	240	209	139
<b>Textile districts:</b>			
Yorkshire	154	142	93
Cheshire	163	156	88
Lancashire	153	144	90
Durham	—	—	—
Northumberland	—	—	—
Cumberland	—	—	—
Westmorland	—	—	—
Northern England	153	143	91
<b>Ports:</b>			
Yorkshire	211	199	146
Cheshire	212	182	136
Lancashire	231	219	166
Durham	232	223	149
Northumberland	227	208	147
Cumberland	—	—	—
Westmorland	—	—	—
Northern England	225	211	157
<b>Other districts:</b>			
Yorkshire	164	157	108
Cheshire	180	163	108
Lancashire	178	167	111
Durham	224	226	157
Northumberland	213	208	141
Cumberland	212	203	138
Westmorland	172	147	125
Northern England	178	169	114

for the whole of Northern England, were very large, 93, 96 and 66 births per 1000 married women aged 15-45, for the three triennial periods. The percentage decline during the 20 years also varied considerably between the occupational districts, for the whole division. The fall in the birth-rate was greatest in the



mining districts, 42.1 per cent, and least in the port districts, 30.2 per cent. The decline in the textile and metal working districts, 40.5 and 38.4 per cent, was greater than in the "other" and commercial districts where the rate had fallen 36.0 and 34.7 per cent respectively. The range of the actual birth-rates within the various occupational groups was greater in the commercial, metal working and "other" districts than in the other three districts, and the textile and mining districts showed the smallest range. The percentage decline in the birth-rate during the 20 years did not show any considerable variation between the counties in the same occupational group. The range of the percentage decline was lowest, 6.4, in the textile districts and highest, 12.7, in the "other" districts.

The effect of the employment of married women on the birth-rate during the last two decades is difficult to estimate. Unfortunately, the number of married women engaged in industry was only tabulated in the census for large towns and since, as has been shown, the birth-rate varied considerably in different occupational areas, a comparison of the birth-rates of these towns, with widely varying occupations, would give unreliable results. A rough and indirect method of assessing the effect of the employment of women on the birth-rate can be obtained by expressing the number of occupied females as a percentage of the total number of women. A serious limitation to this method is that a comparison of two groups as regards married women cannot be made, and the proportion of single and married women differ owing to the varying conditions of female labour. Thus in the West Riding mining areas, where fewer opportunities existed for female labour than in the textile areas, the young women migrated to other centres for work. The married women formed 72.4 per cent of the female population aged 20 years and over in the mining areas and 58.0 per cent in the textile districts of the West Riding. This method was used for two urban occupational groups, the textile and mining areas of Table III. The results obtained are as follows:

	No. of districts	Percentage of women aged 12 years and over occupied in 1921	Correlation between the percentage of occupied women aged 12 and over in 1921 and	
			Birth-rate 1920-2	Percentage decline in the birth-rate 1911-32
			$r \pm s.e.$	$r \pm s.e.$
Textile areas				
Lancashire	30	53.0	-0.0877 $\pm$ 0.181	0.0233 $\pm$ 0.182
West Riding	36	43.3	-0.2027 $\pm$ 0.160	0.0233 $\pm$ 0.167
Mining areas				
Lancashire	23	33.1	-0.7568 $\pm$ 0.089	0.1055 $\pm$ 0.206
West Riding	31	18.8	-0.7571 $\pm$ 0.077	0.3245 $\pm$ 0.161

These results are not easy to interpret. Taking the textile areas first; in neither Lancashire nor Yorkshire is there, for 1920-2, any sensible correlation between the birth-rate and the proportion of occupied women although in these areas many married women are employed. It might perhaps be suggested that by 1920-2 the general rate of fertility in these areas had fallen to so low a

level that there was little scope for variation; it is true that the fertility rates were low and that when the data of 1911 are used one of the two correlations, that for Lancashire, is appreciably higher, viz.  $-0.3257 \pm 0.179$ , but the correlation for the West Riding is not significantly changed,  $-0.1572 \pm 0.20$ . From the large fall in the birth-rates between 1920-2 and 1930-2, it is plain that there was ample scope for variation. At the most, it might be argued that if the level of fertility is *mainly* determined by contraceptive measures, then, almost by 1911 and certainly by 1921, the use of these methods had become so widespread that resort to them by occupied women had ceased to be more frequent than their use by married women not gainfully employed.

But consideration of the mining areas leads to a contradiction. At first sight the large negative correlations between the birth-rate and proportions of occupied women might seem merely a different way of expressing the fact that mining is associated with relatively high birth-rates because the mining industry offers little scope for the gainful employment of women. If that were the explanation we should expect the partial correlation between percentage of occupied women and the birth-rate for a constant percentage of men employed in mining to be negligible. It is actually  $-0.6628 \pm 0.101$  (the correlation between percentage of occupied women and percentage of males engaged in mining although substantial,  $-0.6683 \pm 0.099$ , was much short of unity). So that one has the statistical paradox that here there is a very sensible relation between the employment of women and the birth-rate, while in the West Riding and Lancashire industrial districts none of significance was found. There is not much plausibility in the supposition that knowledge of and resort to contraceptives were really less complete in the mining than in the textile areas of the same county. A case for it could no doubt be made, but statistically speaking, it is not clear how such an hypothesis could be tested. More refined investigation would seem to be necessary. Passing to the association of employment of women with the percentage decline of the birth-rate, the results are less discordant. There is indeed some contrast even here between the textile and mining areas, but having regard to the standard errors, only in the West Riding does the relation seem to have any significance.

The birth-rates for broad occupational groups of rural districts are given in Table IV for the last three triennial periods. The districts where more than half the male population were engaged on the land in 1921 have been grouped under agricultural districts. The agricultural and industrial districts had 30 to 50 per cent of the occupied males employed in agriculture. The mining districts had more than 30 per cent of the males engaged in mining and quarrying. The remaining areas have been grouped under "other" districts. The largest birth-rate in the rural areas, as in the urban areas, was that of the mining districts. The birth-rate of the agricultural districts is in excess of the semi- and non-agricultural rural districts. The decline in the birth-rates during the 20 years, for the division as a whole, was least in the agricultural districts and agricultural and industrial districts where the birth-rate fell by one-third compared

with 40 per cent in the mining districts and "other" districts. As a result of this varying rate of decline, the birth-rate in the mining areas, which in 1911-13 had the largest birth-rates in each county, was only largest in Yorkshire and Durham in 1930-2. The "other" districts showed the largest variation in the percentage decline during the 20 years, 15.3, and the mining districts the least, 4.3.

Table IV. *Northern England. Rural districts. Legitimate birth-rates per 1000 married women, aged 15-45*

Administrative county	1911-13	1920-2	1930-2
<b>Agricultural districts:</b>			
Yorkshire	207	190	136
Cheshire	193	191	140
Lancashire	194	177	125
Durham	—	—	—
Northumberland	204	177	131
Cumberland	224	207	156
Westmorland	204	191	149
Northern England	206	189	137
<b>Agricultural and industrial districts:</b>			
Yorkshire	193	175	134
Cheshire	173	162	117
Lancashire	179	162	118
Durham	211	191	141
Northumberland	194	169	122
Cumberland	182	181	137
Westmorland	189	170	121
Northern England	186	170	126
<b>Mining districts:</b>			
Yorkshire	253	222	146
Cheshire	—	—	—
Lancashire	212	184	117
Durham	252	227	150
Northumberland	212	186	122
Cumberland	234	204	137
Westmorland	—	—	—
Northern England	249	222	146
<b>Other districts:</b>			
Yorkshire	185	165	132
Cheshire	189	160	109
Lancashire	180	161	101
Durham	211	202	145
Northumberland	—	—	—
Cumberland	—	—	—
Westmorland	—	—	—
Northern England	186	164	115

### *Population*

The population at the end of the period for which occupational districts were discussed, expressed as a percentage of the population at the beginning, is:

	Population of 1931 as a percentage of 1911
East Riding	112
North Riding	112
West Riding	110
Cheshire	113
Lancashire	106
Durham	108
Northumberland	109
Cumberland	99
Westmorland	103
England and Wales	111

Cumberland and Westmorland showed a decline in the population during 1921-31, the remaining districts showed an increase at each census.

### *Summary*

The decline in the birth-rate occurred in each county of this division during the decade 1870-80 and during the 60 years 1870-1930 the birth-rate has been more than halved. The rate of decline has been greater in the latter years than in the earlier years, and the counties where the rate fell more slowly at first tended subsequently to have a greater rate of decline. Changes in the age constitution of the married women were not a factor of appreciable importance in the decline, since the potential rate in 1930-2 was only 4.0 to 8.1 per cent below its value in 1870-2.

During the last 20 years the birth-rates of the county boroughs were generally higher than the birth-rates of the urban and rural districts, and with few exceptions the rate of decline was slightly less in the county boroughs.

For the last three triennia when the birth-rate was studied in occupational districts the lowest rates were those of the urban commercial and textile districts where the birth-rate was considerably below the level of the other occupational districts. The urban mining districts had a rate in defect of the rural mining districts in each triennium, but the rate of decline was the same for both and these two groups showed the largest percentage fall during the 20 years. The port districts had a high birth-rate and the lowest percentage decline, so that in 1930-2 the birth-rate of this type of occupational district was higher than in any other urban or rural occupational area. Some variation in the birth-rates within an occupational group existed; thus although the birth-rates for "other" districts are low for the division as a whole, the rural and urban areas in this occupation in Durham show high figures.

## 2. ENGLAND AND WALES

### *Fertility*

The first conclusion to which this detailed survey leads is that the decline in the birth-rate of England and Wales began, in most parts of the country, between 1870-2 and 1880-2, although in some counties the fall did not occur until the next decade, while in Cornwall the birth-rate had apparently declined throughout the whole period under review, i.e. from 1850-2 onwards. To give a general view of the course of the birth-rate in the twelve districts which have been separately studied, the actual birth-rate, the potential birth-rate and the fertility ratio for each of these areas are set out in Table V. A fall in the birth-rate occurred during 1870-2 to 1880-2 in nine of these divisions; the exceptions were London, the Eastern and the South-western divisions where the decline did not take place until the following decade. Throughout the 80 years considerable variation existed in the actual birth-rates of the divisions, and the difference between the highest and lowest birth-rate in each triennia ranged

Table V. *England and Wales. Legitimate birth-rates per 1000 married women, aged 15-45*

Division	1850-2			1860-2			1870-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
London	251	259	97	257	259	99	270	261	103
South-eastern	280	255	110	275	255	108	284	257	111
South Midland	288	257	112	283	255	111	296	255	116
Eastern	276	257	107	269	253	106	286	254	113
South-western	290	250	116	290	251	116	289	252	115
West Midland	288	259	111	289	260	111	302	259	117
North Midland	288	256	113	285	256	111	294	258	114
North-western	294	262	112	284	262	108	296	261	113
Yorkshire	299	261	115	287	260	110	293	262	112
Northern	300	260	115	308	263	117	319	267	119
South Wales	299	253	118	306	258	119	316	258	122
North Wales	283	245	116	289	247	117	302	249	121

Division	1880-2			1890-2			1900-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
London	273	261	105	250	259	97	228	255	89
South-eastern	282	254	111	247	250	99	215	248	87
South Midland	289	252	115	260	250	104	225	249	90
Eastern	292	255	115	266	253	105	236	250	94
South-western	290	250	116	261	249	105	219	244	90
West Midland	295	256	115	279	256	109	246	249	99
North Midland	290	261	111	263	256	103	237	255	93
North-western	285	260	110	265	257	103	233	254	92
Yorkshire	276	260	106	253	257	98	228	256	89
Northern	306	264	116	295	263	112	274	261	105
South Wales	306	259	118	301	262	115	271	258	105
North Wales	283	248	114	262	244	107	246	245	100

Division	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
London	198	246	80	183	245	75	119	246	48
South-eastern	174	241	72	157	238	66	115	242	48
South Midland	181	241	75	163	237	69	111	243	46
Eastern	193	242	80	178	241	74	122	243	50
South-western	177	240	74	164	239	69	116	241	48
West Midland	209	246	85	192	245	78	130	245	53
North Midland	195	249	78	177	246	72	124	247	50
North-western	192	245	78	175	241	73	122	241	51
Yorkshire	191	247	77	175	245	72	122	245	50
Northern	232	253	92	216	252	86	147	247	60
South Wales	234	253	92	201	251	80	128	245	52
North Wales	201	234	86	175	235	74	134	239	56

Division	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
South-eastern	171	244	70	152	240	63	113	243	47
South Midland	170	242	70	160	241	66	110	244	45
Eastern	217	246	88	186	244	76	124	244	51
South-western	172	246	70	163	244	67	114	246	46
West Midland	203	247	82	189	245	78	129	245	53
North Midland	178	248	72	168	245	69	120	246	49
North-western	203	247	82	185	242	76	132	242	55
Yorkshire	186	247	75	174	245	71	119	245	49
Northern	227	251	90	219	252	87	151	247	61
South Wales	215	252	85	190	250	76	126	245	51
North Wales	—	—	—	—	—	—	—	—	—

A. = Actual birth-rate; P. = Potential birth-rate; F.R. = Fertility ratio.

Table V (continued)

Division	Urban districts								
	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
South-eastern	172	241	71	154	238	65	113	243	47
South Midland	180	242	74	160	236	68	109	244	45
Eastern	180	240	75	166	239	69	115	242	48
South-western	169	240	70	153	238	64	110	241	46
West Midland	222	249	89	198	248	80	132	245	54
North Midland	200	252	79	178	248	72	122	248	49
North-western	174	243	72	160	239	67	106	239	44
Yorkshire	190	247	77	168	244	69	119	244	49
Northern	240	255	94	215	253	85	145	248	58
South Wales	242	256	95	205	254	81	126	246	51
North Wales	187	233	80	152	234	65	123	239	51

Division	Rural districts								
	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
South-eastern	178	238	75	169	236	72	120	241	50
South Midland	186	238	78	174	237	73	119	242	49
Eastern	194	240	81	183	238	77	129	241	54
South-western	185	237	78	175	238	74	123	240	51
West Midland	205	239	86	190	242	79	133	242	55
North Midland	206	247	83	184	245	75	130	248	52
North-western	183	238	77	165	236	70	113	239	47
Yorkshire	217	247	88	194	245	79	138	247	56
Northern	226	253	89	212	252	84	144	247	58
South Wales	239	248	96	203	246	83	132	242	55
North Wales	211	235	90	193	236	82	143	239	60

A. = Actual birth-rate; P. = Potential birth-rate; F.R. = Fertility ratio.

from 33 to 60 births per 1000 married women aged 15-45. The actual birth-rates were highest in the Northern division, in South Wales and in the West Midland division for each triennial period while the rates for the South-eastern division were low. The actual birth-rates for London were the lowest for the first four triennia, but owing to a slower rate of decline the relative position of the London rate improved until it was fourth in order in 1920-2; in the final triennium, however, it showed the largest percentage fall in the birth-rate and so concluded with a relatively low rate. The maximum potential birth-rate was reached in the earlier years in every division, but the course of this rate in South Wales, where it increased up to 1890-2, differed from that of the other divisions. The range of the potential rate in 1930-2 was only half of that in the preceding triennia, due to the check in the decline of the potential rate in most divisions. The potential birth-rate of 1930-2 was slightly above that of 1920-2 in most divisions and only the Northern and South Wales divisions showed a continued decrease in the later years. But despite this the married women of the Northern division had the most favourable age constitution for a high birth-rate. When the divisions were arranged in order of their fertility ratio, the position of the Welsh divisions and the South-eastern and South-western divisions were slightly higher, generally, than when arranged according to the

actual birth-rate and the Northern, North-western and Yorkshire divisions are, generally, slightly below the order of their actual birth-rates. The differences, however, were not very great, and the highest fertility ratios, for the period as a whole, were those of South Wales and the Northern division.

Table VI shows the actual birth-rates, potential birth-rates and fertility ratios expressed as a percentage of the rates for 1870-2. During the 60 years the actual birth-rate fell by 53.9 to 62.5 per cent and the potential rate by 4.0 to 7.7 per cent. Thus the change in the age constitution of the married women due to later marriage was clearly not a factor of much importance in the decline of the birth-rate.

Table VI. *England and Wales. Legitimate birth-rates as a percentage of those of 1870-2*

Division	1850-2			1860-2			1870-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
London	93.0	99.2	94.2	95.2	99.2	96.1	100.0	100.0	100.0
South-eastern	98.6	99.2	99.1	96.8	99.2	97.3	100.0	100.0	100.0
South Midland	97.3	100.8	96.6	95.6	100.0	95.7	100.0	100.0	100.0
Eastern	96.5	101.2	94.7	94.1	99.6	93.8	100.0	100.0	100.0
South-western	100.3	99.2	100.9	100.3	99.6	100.9	100.0	100.0	100.0
West Midland	95.4	100.0	94.9	95.7	100.4	94.9	100.0	100.0	100.0
North Midland	98.0	99.2	99.1	96.9	99.2	97.4	100.0	100.0	100.0
North-western	99.3	100.4	99.1	95.9	100.4	95.6	100.0	100.0	100.0
Yorkshire	102.0	99.6	102.7	98.0	99.2	98.2	100.0	100.0	100.0
Northern	94.0	97.4	96.6	96.6	98.5	98.3	100.0	100.0	100.0
South Wales	94.6	98.1	96.7	96.8	100.0	97.5	100.0	100.0	100.0
North Wales	93.7	98.4	95.9	95.7	99.2	96.7	100.0	100.0	100.0

Division	1880-2			1890-2			1900-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
London	101.1	100.0	101.9	92.6	99.2	94.2	84.4	97.7	86.4
South-eastern	99.3	98.8	100.0	87.0	97.3	89.2	75.7	96.5	78.4
South Midland	97.6	98.8	99.1	87.8	98.0	89.7	76.0	97.6	77.6
Eastern	102.1	100.4	101.8	93.0	99.6	92.9	82.5	98.4	83.2
South-western	100.3	99.2	100.9	90.3	98.8	91.3	75.8	96.8	78.3
West Midland	97.7	98.8	98.3	92.4	98.8	93.2	81.5	96.1	84.6
North Midland	98.6	101.2	97.4	89.5	99.2	90.4	80.6	98.8	81.6
North-western	96.3	99.6	97.3	89.5	98.5	91.1	78.7	97.3	81.4
Yorkshire	94.2	99.2	94.6	86.3	98.1	87.5	77.8	97.7	79.5
Northern	95.9	98.9	97.5	92.5	98.5	94.1	85.9	97.8	88.2
South Wales	96.8	100.4	96.7	95.3	101.6	94.3	85.8	100.0	86.1
North Wales	93.7	99.6	94.2	86.8	98.0	88.4	81.5	98.4	82.6

Division	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
London	73.3	94.3	77.7	67.8	93.9	72.8	44.1	94.3	46.6
South-eastern	61.3	93.8	64.9	55.3	92.6	59.5	40.5	94.2	43.2
South Midland	61.1	94.5	64.7	65.1	92.9	59.5	37.5	95.3	39.7
Eastern	67.5	95.3	70.8	62.2	94.9	65.5	42.7	95.7	44.2
South-western	61.2	95.2	64.3	56.7	94.8	60.0	40.1	95.6	41.7
West Midland	69.2	95.0	72.6	63.6	94.6	66.7	43.0	94.6	45.3
North Midland	66.3	96.5	68.4	60.2	95.3	63.2	42.2	95.7	43.9
North-western	64.9	93.9	69.0	59.1	92.3	64.6	41.2	92.3	45.1
Yorkshire	65.2	94.3	68.8	59.7	93.5	64.3	41.6	93.5	44.6
Northern	72.7	94.8	77.3	67.7	94.4	72.3	46.1	92.5	50.4
South Wales	74.1	98.1	75.4	63.6	97.3	65.6	40.5	95.0	42.6
North Wales	66.6	94.0	71.1	57.9	94.4	61.2	44.4	96.0	46.3

A. = Actual birth-rate; P. = Potential birth-rate; F.R. = Fertility ratio.



Another point that is clearly brought out is that the rate of decline in the actual birth-rate was not constant during the last 60 years, in fact, the percentage decline in the last 30 years was twice as great as that in the first 30 years. The divisions where the birth-rate declined more slowly in the earlier periods tended to have an accelerated fall in the later periods. Thus in South Wales and the Northern divisions the birth-rate of 1911–13 showed a percentage decline of only 25·9 and 27·3 respectively on the 1870–2 value, but the 1930–2 birth-rates showed a further decrease of 33·6 and 26·6 per cent respectively; the South-western division, on the other hand, with a percentage decline of 38·8 by 1911–13 only decreased by a further 21·1 per cent in 1930–2. The Sketch Maps (pp. 506 and 507) illustrate more clearly the percentage decline, within the counties, for the two periods 1870–2 to 1930–2 and from 1911–13 to 1930–2.

*The effects of social conditions on the birth-rate*

A differential birth-rate was operating during the period under review, i.e. under higher social conditions were found the lowest birth-rates. This was demonstrated, in the previous papers, for London and for various areas in the counties where the districts which had a high proportion of males engaged in commerce, etc., and a high proportion of female domestic servants, conditions typical of residential areas, had a low birth-rate. The decline in the birth-rate appeared to be universal, although it commenced at varying periods, and, despite the varying initial level, no very striking differences existed between the percentage fall.

The birth-rates in broad occupational groups have been given, in the preceding sections, for each county and these have been summarized in Table VII for the whole country, excluding Northern England for the period 1860–90, which was reviewed by Dr Elderton. The mining and the combined mining and agricultural districts had the highest birth-rates and the lowest rate of fall during 1860–90. The garrison districts had the lowest birth-rate throughout this period and the birth-rates of the remaining occupational districts were in relation to the proportion of males employed in agriculture. The rate of decline for these areas was approximately the same. In the first triennium when the country was divided into administrative areas, the urban mining districts had the largest birth-rate and the largest percentage decline during the 20 years. The birth-rate in the port districts of Northern England declined the least during this period, so that in 1930–2 these areas had a rate considerably in excess of any of the other occupational districts. The urban commercial and textile districts had the lowest birth-rates in each triennium. In the rural districts the mining areas showed an advantage over the agricultural districts in 1911–13, but owing to a greater rate of decline this was practically lost in 1930–2. There were some variations from the general trend in the occupational districts of the individual counties.

Table VII. *England and Wales. Legitimate birth-rate per 1000 married women, aged 15-45*

	1860-2	1870-2	1880-2	1890-2	% decline 1870-92
Registration districts:					
Agricultural	286	296	291	266	10.1
Mining	306	322	310	308	4.3
Agricultural and mining	297	302	296	282	6.6
Agricultural and industrial	281	291	287	262	10.0
Garrison districts	266	271	276	246	9.2
Other districts	275	284	285	254	10.6
Administrative urban districts:		1911-13	1920-2	1930-2	1911-32
Mining	—	241	207	135	44.0
Metal working	—	211	190	131	37.9
Commercial	—	154	125	98	36.4
Agricultural	—	184	178	128	30.4
Ports (northern)	—	225	211	157	30.2
Textiles	—	153	143	91	40.5
Garrison districts (southern)	—	180	167	121	32.8
Other districts	—	181	167	116	35.9
Administrative rural districts:		1911-13	1920-2	1930-2	1911-32
Agricultural	—	200	188	134	33.0
Mining	—	238	213	140	41.2
Agricultural and mining	—	209	194	132	36.8
Agricultural and industrial	—	189	173	123	34.9
Other districts	—	183	170	119	35.0

*Fertility by age of mother*

The trend of the birth-rates for individual ages of the mother for the 80 years reviewed would be interesting, but this is not possible since the age of mother is not recorded when a birth is registered. The census data of 1921 and 1931 provided the Registrar-General with a means of finding an indirect estimation of these rates; they were as follows:

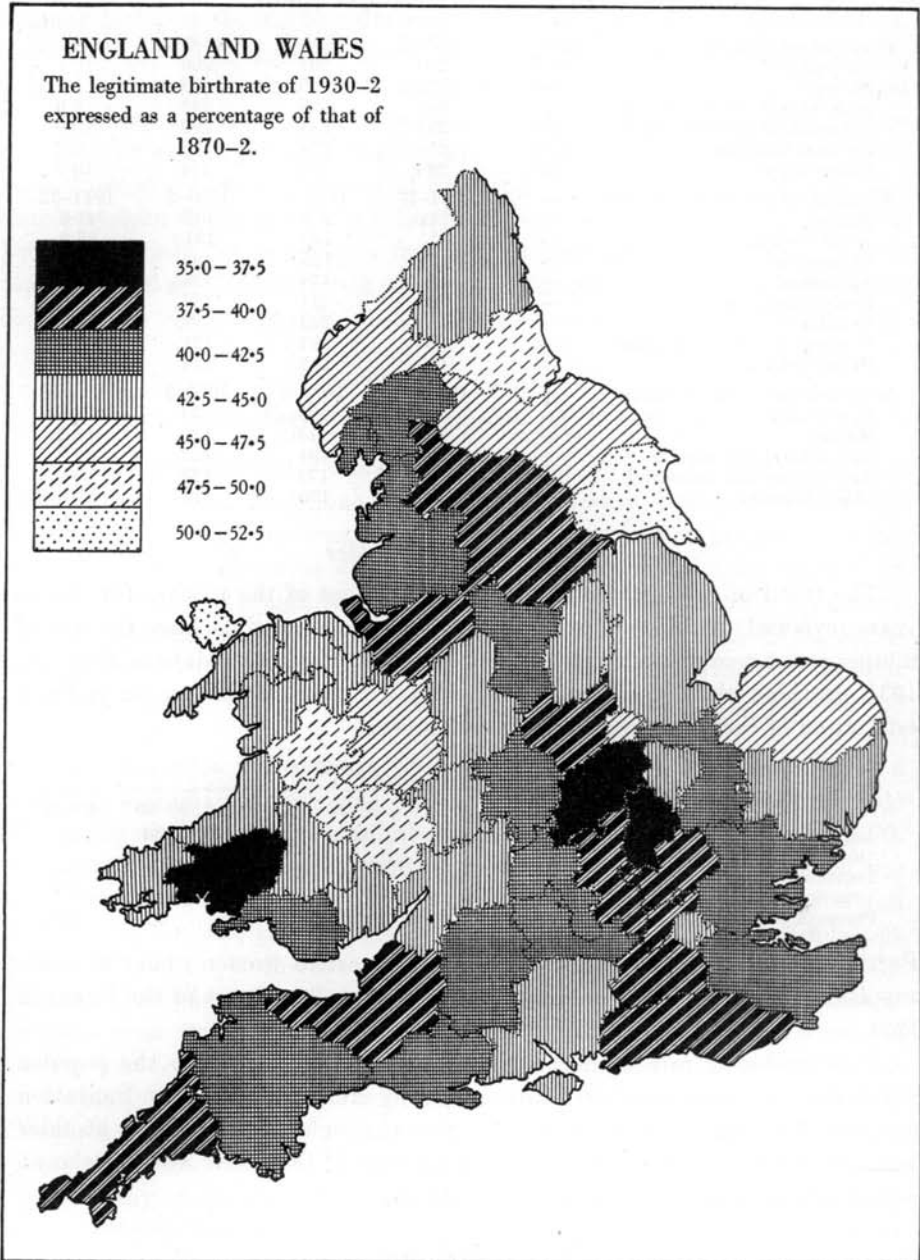
	Age of mother					
	15-19	20-24	25-29	30-34	35-39	40-44
Legitimate births per 1000 married women, 1921	397	334	260	194	130	56
Legitimate births per 1000 married women, 1931	372	267	187	127	81	33
Percentage decline 1921-31	6.3	20.1	28.1	34.5	37.7	41.1

Putting this information in another way, the married women under 25 years supplied 20.5 per cent of the births in 1921 and 22.3 per cent of the births in 1931.

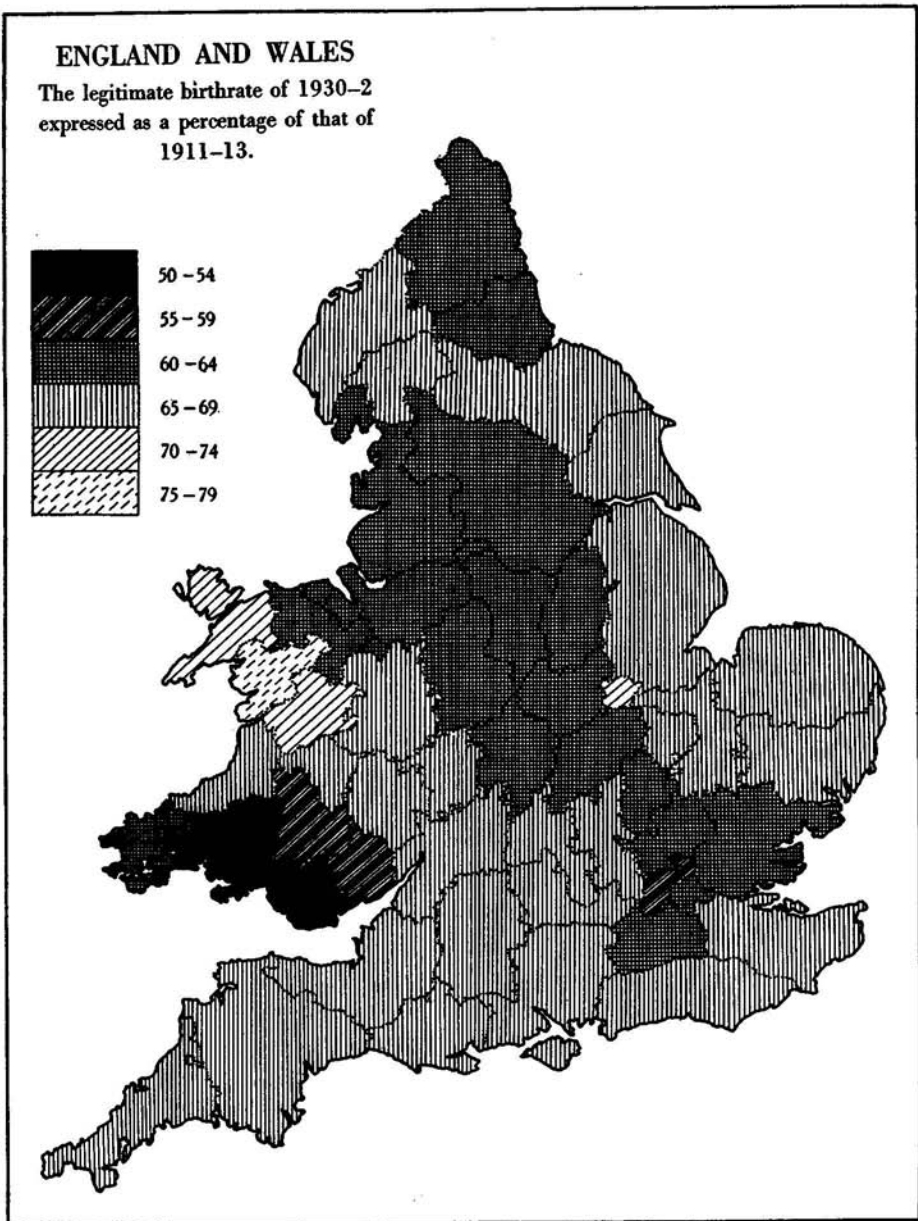
This increasing rate of decline with age is in opposition to the popular belief that the declining birth-rate is mainly due to the family limitation practised by young women. It may be that the high rates of decline at older ages are due to deliberate limitation of the size of family of women who at earlier ages have already borne some children.

*Causes of decline*

In the report which I took as a starting-point of this investigation, Dr Elderton attributed the decline primarily to the lowered economic value of children due to factory and industrial legislation, a view frequently expressed



Sketch map 1.



Sketch map 2.

by the late Prof. Karl Pearson. This is congruent with the commonly held view that volitional limitation of fertility, birth control, is the direct cause. The economic motive to produce children has weakened, knowledge of unrepugnant methods of contraception has spread and moral objections to their use have become obsolete.

No statistical result deduced in this investigation is irreconcilable with this explanation, but it is perhaps going too far to conclude that the explanation is wholly satisfactory. Two eminent statisticians, at least, the late Dr John Brownlee and Mr Udny Yule, have strongly criticized the popular hypothesis. Both these writers have urged that great changes in fertility have occurred in nations or sections of nations under conditions precluding "birth control". If that can be demonstrated, it clearly follows not that the current belief is certainly false, but that it may be false.

In a paper communicated to the Royal Philosophical Society of Glasgow in 1908, Dr Brownlee supported the thesis that in many nations, in England, France, and Spain, among others, there were epochs of waxing and waning population which were associated with increasing or decreasing national energy. These alternations he attributed to changes of germinal vitality, rather than to variations in means of subsistence—as Malthus would no doubt have urged—and he drew attention to changes of birth-rate in, for instance, Geneva and parts of Scotland which seemed to him to support the argument.

More recently Mr Udny Yule (*The Fall of the Birth-Rate*, Camb. Univ. Press, 1920) has instanced the changes in the standardized birth-rate of Connaught, which increased from 36.6 in 1881 to 37.98 in 1901 and 45.3 in 1911, as examples of change wholly independent of birth control.

Russell (*Metron.* 7, 101–13) has investigated this question. Using the Swedish fertility rates in age groups for 1911, he took the age distribution of married women in Ireland as shown at the five censuses from 1871 and expressed the actual births as percentages of the potential births on the Swedish standards. In Connaught, with a Roman Catholic population of 95 per cent, the fertility ratios from 1870–2 to 1910–12 were 1.063, 0.954, 1.054, 1.097, 1.299, or as percentages of the 1870–2 value, 100, 90, 99, 103, 122. In Ulster with 49 per cent Roman Catholics, the corresponding figures are 100, 94, 95, 94, 94. Within the province of Ulster two counties, Cavan with 81 and Donegal with 79 per cent, are predominantly Roman Catholic. Donegal agreed with Connaught, its figures being 100, 100, 109, 116, 133, except that 1880–2 showed no decline. Cavan, 100, 86, 82, 83, 97, showed the 1880–2 fall but no strong recovery. Antrim, with only 25 per cent Roman Catholics, has run a level course, 100, 96, 102, 98, 92. These results confirm Mr Yule's and Dr Brownlee's view that considerable changes of fertility level may occur under conditions which make the current explanation not, of course, impossible, but certainly difficult to accept. On the other hand recent investigation, including indeed some of Brownlee's own work, makes it probable that the increase of population in England and Wales at least in the last three decades on the



eighteenth century and the early years of the nineteenth century was a consequence of decreasing mortality not of increasing fertility. This subject has been elucidated by, among others, Miss Buer, and Talbot Griffith. It cannot be said that, for the country as a whole, there is really satisfactory evidence that, until it began to decline towards the end of the nineteenth century, the true fertility rate has greatly changed.

These results tell against Dr Brownlee's general doctrine; they do not, of course, weaken such inferences as may be drawn from the peculiar movements of fertility in the Irish counties.

The general balance of evidence suggests that the current explanation is the most satisfactory available although not wholly convincing.

*The effects of the decline*

The immediate effect of the declining birth-rate has been to raise the average age of the population. Table VIII shows the percentage of the population in each of five age groups for each census during the period under review. The

Table VIII. *England and Wales. Percentage of population in five age groups at each census*

Ages	1851	1861	1871	1881	1891	1901	1911	1921	1931
0-	35.44	35.63	36.11	36.45	35.07	32.42	30.64	27.72	23.83
15-	27.30	26.57	26.27	26.66	27.40	28.26	26.59	25.38	25.75
30-	18.59	18.67	18.19	18.04	18.47	19.76	21.41	21.51	21.33
45-	11.35	11.72	11.95	11.47	11.66	12.16	13.33	15.97	17.53
60 and over	7.32	7.42	7.47	7.38	7.40	7.40	8.04	9.43	11.56

age group that has been chiefly affected is the 0-15 group, which in the earlier years had a percentage of 12-13 above that shown in 1931. At the census of 1881 there were 81 per cent of the total population living at ages under 45 years and in 1931 the proportion had declined to 71 per cent. This ageing of the population will continue and must in the future seriously affect the economic and social life of the nation.

The present trend of the birth-rate will ultimately result in a decrease in the population; that a diminution has not already occurred is due to the decline in the death-rate. The death- and birth-rates for the period reviewed are:

	Rates per 1000 of the population		
	Deaths	Births	Increase
1851-1861	22.2	34.1	11.9
1861-1871	22.5	35.2	12.7
1871-1881	21.4	35.4	14.0
1881-1891	19.1	32.4	13.3
1891-1901	18.2	29.9	11.7
1901-1911	15.4	27.2	11.8
1911-1921	14.4	21.8	7.4
1921-1931	12.1	18.3	6.2

As the proportion of the population in the older age groups increases the diminution of the death-rate will cease since the improvement in mortality rates has been mainly in the younger ages. That is, although the mortality

rates in age groups may still decline, the crude death-rate at all ages will increase, since an increasing proportion of the population will belong to the older ages where the death-rate is normally high. During this century the crude death-rate has gradually risen above the standardized death-rate and in 1930-5 the crude rate was 2.4 per 1000 living in excess of the standardized rate.

#### SUMMARY

From this survey of the birth-rate over a period of nearly a hundred years the outstanding feature has been its serious decline. The birth-rate of England and Wales during 1930-2 was 57.9 per cent in defect of that registered in 1870-2. The decline has not been in a fixed progression, it has been more accelerated at some periods than others. In the period from 1870-2 to 1900-2 the decrease was 56 births per 1000 married women aged 15-45, but in the next 30 years the decrease was no less than 113 births per 1000 married women. The decline affected every occupational and social class. The fall was of the order of 10 per cent during 1870-2 to 1890-2 for every occupational district except the mining districts where the rate fell only 4.3 per cent, but these occupational districts showed the largest decrease, 43.0 per cent, during the last 20 years, 1911-13 to 1930-2. The ports and agricultural districts had the least decrease, roughly one-third, during the last 20 years.

The decrease amongst the more affluent classes is probably the most serious aspect of the decline since the bulk of the population will be more largely recruited than heretofore from a relatively small section of the community which from an economic standpoint, apart from other considerations, will be least able to maintain a family. In the completed fertilities of the 1911 fertility report, one-quarter of the wives with large families contributed over one-half of the children, whilst at the other end of the scale one-third of the wives had only one-twentieth of the children born.

As an element in the causation of the decline, the later age of marriage cannot be included as of material importance. The fall in the potential rate, relative to the fall in the actual rate, was very small (roughly one-tenth) and during 1911-32, when the potential rate tended to increase, the actual birth-rate fell with increased rapidity. The decline appears to be due to the greater economic pressure within the family in consequence upon the advent of an extra child. Trade stagnation is also a factor in depressing the birth-rate, this is evident in the accelerated rate of decline during 1911-32 in South Wales, Northumberland and Durham (shown in the Sketch Maps of the percentage decline for the whole period and for the last 20 years for the counties of England and Wales).

The recruitment of the population at a decreasing rate will have serious social and economic effects due to the increasing age of the population. In 1901 7.40 per cent of the people were aged 60 and over, in 1931 this percentage had risen to 11.56, an increase of 50 per cent. The national social services cost the



country roughly £150,000,000 annually, of which a third is for old age pensions. The present trend of the birth-rate means a relative increase in old age pensioners and a decreased number of contributors. The methods of production to-day are planned for an increasing consumption and certainly not for a shrinking population.

Finally, the birth-rate had fallen by 1930–2 below the level necessary to maintain a stable population, the rate was 40 births per 1000 married women aged 15–45 below the minimum rate required for stability. If the present mortality rates and marriage rates are maintained then an average family of three children are required to keep the population stationary. For the population to continue to increase a 50 per cent rise in the present birth-rate is necessary.

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