

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

BY W. J. MARTIN, B.Sc.

*Of the Medical Research Council's Statistical Staff*

*From the Division of Epidemiology and Vital Statistics,  
London School of Hygiene and Tropical Medicine*

(With 2 Maps)

FEW demographic phenomena have attracted more attention than the decline of the birth-rate, which, in many countries, began more than a generation ago, and, in nearly all European countries, has proceeded with accelerated velocity since the War.

It would be superfluous to call attention to the consequences of this movement; that has been done by many competent writers. There is equally little need to expatiate upon the mechanism, whether deliberately invoked—as a majority of writers hold—or a resultant of subtle biological changes—as a few authoritative writers have asserted.

But it is certainly of interest to examine to what extent this universal change is differentiated by locality and occupation within our own country, to attempt to bring together in a concise form the information contained in the periodical statistical reports issued during the last 80 years.

More than 20 years ago, Dr Ethel M. Elderton, working in the late Prof. Karl Pearson's laboratory, published an exhaustive study of the changes in the English birth-rate which had occurred between 1851 and 1906 north of the Humber. This monograph gives a complete account of the progress of events, and it is to be regretted that the pressure of other work did not allow Dr Elderton to complete her survey.

In the present study an attempt has been made to supplement Dr Elderton's earlier work. The object has been not to provide an analysis quite so detailed as hers—indeed an ambition to do so would almost certainly be frustrated as was hers, by the pressure of other duties—but to provide sufficient detail to enable a reader to obtain a reasonably clear view of changes in the constituent parts of the country. It was thought well to begin, not by bringing Dr Elderton's study of the north down to date, but by analysing the data of areas contrasting both geographically, racially and occupationally rather strongly with those she investigated, viz. to take Wales and the southern districts of England.

Dr Elderton's analysis ended before the method of presenting the national statistics was altered and the administrative instead of the registration area became the unit of publication. This change, required for administrative

purposes, involved a breach of statistical continuity and necessarily precluded a very detailed tabulation. It is, however, believed that broad comparisons are still valid.

It is inevitable that a study of this character should be lacking in vividness, that it should amount rather to a presentation of facts than an interpretation of them. It is hoped that it may at least bring together in a form useful to sociologists important information, the extraction of which from official documents and summarization in the form of statistical indices involve much time and labour.

The birth-rate in this study has been represented by the number of legitimate births per 1000 married women between the ages of 15 and 45. It was deemed advisable not to exceed the age of 45 as there are few children born to women beyond this age, and the introduction of the age group 45-55 would only tend to understate the actual fertility. The average number of births for the three years which centred around each census year was used. An exception had to be made for 1911. For this triennium the average of the births in the census year and the two succeeding years was taken, since it was not possible to reconstruct the data for either registration or administrative districts from the other. Furthermore, since 1911 the administrative counties have replaced the registration counties as units for which statistics are officially tabulated. Although a registration county and an administrative county are not necessarily coterminous, it is thought that no serious error will be introduced in a comparison of the fertility before and after 1911. Triennial periods were used as being more likely to prevent the chance fluctuations that arise when a yearly rate is considered and to overcome the difficulties of estimating the population of married women in the intercensal years. In addition to the actual birth-rate, a theoretical or potential birth-rate was also calculated. The potential birth-rate supplies an index of fertility free from the disturbing influence of the varying age constitution of married women at successive censuses. The method employed in the present instance was that described by Prof. Tait in Duncan's work on *Fecundity, Fertility and Sterility*, which was also used by Dr E. M. Elderton in her study of the birth-rate north of the Humber. On the basis of the records for a sample of married women in Glasgow and Edinburgh in the year 1855, according to Tait, the probable number of children born to 100 married women aged 15-19 inclusive was 48.75; for those aged 20-25 the probable number was 41.25; for those aged 25-35 and 35-45 years the values were 30 and 15 respectively. Multiplying the actual number of wives recorded at these different age periods at any specific census by these factors and dividing the sum of these products by the total number of wives aged 15-45 we obtain the potential birth-rate per 100 married women for that particular year. Of course the average fecundity of married women aged 15-19, for example, may or may not be accurately represented by a value of 48.75 births per 100 married women, but the approximation obtained by the adoption of Tait's

fertility ratio will be sufficient to indicate whether changes in the age distribution of married women are, or are not, largely responsible for a decreased birth-rate. The ratio of the actual to the potential birth-rate was also calculated and the result called the fertility ratio.

### I. SOUTH WALES

The birth-rate in Wales has been, during the past 80 years for which we have statistics, higher than the rates of either the south-eastern or south-western divisions of England. For this reason and because of the contrast between the two main occupations of Wales, i.e. agriculture, and mining and quarrying, it is of interest to study the Welsh division first. The period examined was 1850–1932, the longest for which statistics are available. The fact that the births prior to 1874 are understated must be borne in mind, for whilst the Act of 1837 made registration of births and deaths compulsory, it imposed no penalty for non-registration; this oversight was remedied by the Notification Act of 1874 which led to more complete registration.

#### *Fertility*

Table I shows the rates in each county for the nine triennial periods beginning at 1850–2 and ending with 1930–2. The birth-rates increased for the first three periods for each individual county but afterwards steadily declined. The legitimate birth-rate was highest in Carmarthenshire until 1930–2 when it became the lowest, the primary position being then taken by the highly agricultural county of Radnorshire. It will be noted that Glamorganshire had the highest potential birth-rate for each period, i.e. the age constitution of the married women in this county apparently favoured a high birth-rate, but despite this advantage its actual birth-rate was lower than that for any other county during the first two triennia. In 1870–2 and 1880–2 the actual birth-rate moved slowly up, and between 1890–2 and 1920–2 it occupied second place; it then fell abruptly in 1930–2 to fifth place. This sudden reversal in position of the two most industrial counties, Glamorganshire and Carmarthenshire, coincided with the great depression in industry.

The potential birth-rate in each county has remained practically constant during the period under review. From this we may conclude that there has been little or no change in the age distribution of the married women, and consequently the decline in the birth-rate is not explicable on these grounds. The potential rates show that Glamorganshire had the highest proportion of young women and Cardiganshire the lowest throughout. Carmarthenshire and Brecknockshire alternated for the second and third positions, Pembrokeshire and Radnorshire for the fourth and fifth. The counties when classified according to the fertility ratio vary more in position from triennium to triennium than when arranged according to their birth-rates. On the whole Glamorganshire has the lowest and Carmarthenshire the highest fertility ratio.

Table I. *South Wales. Legitimate births 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.
Glamorganshire	293	263	111	298	266	112	310	264	117
Carmarthenshire	316	248	123	330	254	130	344	256	134
Pembrokeshire	306	242	126	312	248	126	320	247	130
Cardiganshire	298	235	127	319	240	133	315	241	131
Brecknockshire	296	252	117	304	252	121	311	252	123
Radnorshire	303	246	123	305	248	123	308	244	126

County	1880-2			1890-2			1900-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Glamorganshire	303	265	114	303	268	113	274	263	104
Carmarthenshire	322	254	127	309	251	123	275	248	111
Pembrokeshire	320	248	129	292	247	118	254	244	104
Cardiganshire	296	240	123	277	237	117	245	233	105
Brecknockshire	296	252	117	292	251	116	273	251	109
Radnorshire	301	249	122	282	244	116	264	251	105

County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Glamorganshire	235	255	92	201	253	79	127	246	52
Carmarthenshire	245	247	99	202	246	82	122	243	50
Pembrokeshire	222	242	92	197	244	81	142	238	60
Cardiganshire	205	228	90	173	232	75	134	231	58
Brecknockshire	227	247	92	199	247	81	134	243	55
Radnorshire	226	231	98	194	235	83	150	242	62

County boroughs									
County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Glamorganshire	215	252	85	190	250	76	126	245	51
Carmarthenshire	—	—	—	—	—	—	—	—	—
Pembrokeshire	—	—	—	—	—	—	—	—	—
Cardiganshire	—	—	—	—	—	—	—	—	—
Brecknockshire	—	—	—	—	—	—	—	—	—
Radnorshire	—	—	—	—	—	—	—	—	—

Urban districts									
County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Glamorganshire	246	259	95	211	256	82	128	247	52
Carmarthenshire	243	246	99	193	248	78	111	243	46
Pembrokeshire	211	246	86	194	247	79	139	241	58
Cardiganshire	192	229	84	122	227	54	105	233	45
Brecknockshire	215	247	87	189	247	77	127	241	53
Radnorshire	193	231	84	139	224	62	127	243	52

Rural districts									
County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Glamorganshire	241	253	95	197	250	79	128	245	52
Carmarthenshire	246	248	99	209	244	86	131	243	54
Pembrokeshire	233	239	97	200	241	83	144	235	61
Cardiganshire	212	228	93	199	235	85	146	231	63
Brecknockshire	232	247	94	207	247	84	137	244	56
Radnorshire	239	231	103	220	240	92	159	242	66

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

For the three periods for which urban and rural districts are given separately we see that in Glamorganshire the county boroughs have the lowest rates, but there is no appreciable difference between urban and rural areas. For the other five counties the rural fertility is higher than the urban. The rural districts in these latter counties contain a high percentage of agricultural workers, whereas the principal occupations in the rural districts of Glamorganshire and to a lesser extent in Carmarthenshire are mining and quarrying. The decline in the birth-rate was greater between 1920 and 1930 than between 1911 and 1920 in both rural and urban districts with the exception of the urban districts of Cardiganshire and Radnorshire, which experienced a very heavy fall between 1911 and 1920.

To illustrate the trend of the birth-rate more clearly the three indices of fertility for each triennium have been expressed as percentages of those in 1870-2, and the results are given in Table II. The period 1870-2 has been adopted as a standard because registration of births was more complete in this triennium than in the earlier ones. The actual birth-rate has decreased by 51.3 per cent. in Radnorshire where it has declined least, and by 64.5 per cent. in Carmarthenshire where the fall has been the most severe.

Table II. *South Wales. Legitimate birth-rates as percentage of those in 1870-2*

County	1850-2			1860-2			1870-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Glamorganshire	94.5	99.6	94.9	96.1	100.8	95.7	100	100	100
Carmarthenshire	91.9	96.9	91.8	95.9	99.2	97.0	100	100	100
Pembrokeshire	95.6	98.0	96.9	97.5	100.4	96.9	100	100	100
Cardiganshire	94.6	97.5	96.9	101.3	99.6	101.5	100	100	100
Brecknockshire	95.2	100.0	95.1	97.7	100.0	98.4	100	100	100
Radnorshire	98.4	100.8	97.6	99.0	101.6	97.6	100	100	100
County	1880-2			1890-2			1900-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Glamorganshire	97.7	100.4	97.4	97.7	101.5	96.6	88.4	99.6	88.9
Carmarthenshire	93.6	99.2	94.8	89.8	98.0	91.8	79.9	96.9	82.8
Pembrokeshire	100.0	100.4	99.2	91.2	100.0	90.8	79.4	98.8	80.0
Cardiganshire	94.0	99.6	93.9	87.9	98.3	89.3	77.8	96.7	80.2
Brecknockshire	95.2	100.0	95.1	93.9	99.6	94.3	87.8	99.6	88.6
Radnorshire	97.7	102.0	96.8	91.6	100.0	92.1	85.7	102.9	83.3
County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Glamorganshire	75.8	96.6	78.6	64.8	95.8	67.5	41.0	93.2	44.4
Carmarthenshire	71.2	96.5	73.9	58.7	96.1	61.2	35.5	94.9	37.3
Pembrokeshire	69.4	98.0	70.8	61.6	98.8	62.3	44.4	96.4	46.2
Cardiganshire	65.1	94.6	68.7	54.9	96.3	57.3	42.5	95.9	44.3
Brecknockshire	73.0	98.0	74.8	64.0	98.0	65.9	43.0	96.4	44.7
Radnorshire	73.4	94.7	77.8	63.0	96.3	65.9	48.7	99.2	49.2

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

### *Occupation*

We have previously seen in Table I that the decline in the birth-rate began between 1870 and 1880. Before proceeding to examine the rates within the individual counties it seems necessary to inquire what events took place in

this decade that might have influenced the course of fertility. A great slump in industry following a boom occurred. From 1851 onwards there was a great increase in the consumption of iron and coal. There was an increasing use of machinery in agriculture, iron ships were replacing wooden structures, and the railways were undergoing very rapid development. In the early seventies there was great activity in the coal and iron trade, and miners were earning as much as £1 a day. The boom, however, terminated about 1875 with disastrous results, which the Webbs describe in their *History of Trade Unionism*. The great expansion of trade, under which Trade Unionism reached in 1873–4 one of its high-water marks, came to an end. The contraction became visible first in the coal and iron industries, those in which inflation had been, perhaps, greatest. The first break occurred in February 1874 when the coal miners of the east of Scotland submitted to a reduction of a shilling a day. During the rest of the year prices and wages came tumbling down in both these staple industries. In 1875 a furious conflict broke out in South Wales, where many thousands of miners and iron workers refused to submit to a third reduction of 10 per cent. in their wages but resumed work later in the year with a reduction of 12½ per cent. The increasing depression of trade reached during 1878–9 a stagnation which must rank as one of the most serious which had ever overtaken British industry. No doubt the trade depression had an effect in reducing the birth-rate, but other influences must have been at work to produce the continuous decline. There have been trade booms since 1870–4, but the birth-rate has not reverted to its former magnitude. During 1870–80 a movement for the limitation of families was instituted. The prime instigators of this policy were Mrs Besant and Mr Charles Bradlaugh, who in 1877 were unsuccessfully prosecuted by the Government for publishing a book entitled *Fruits of Philosophy*. The action of the Government probably helped to focus public attention on the subject. As Dr Elderton has pointed out in her report, the compulsory Education Act of 1876, the Factories and Workshops Act of 1878 and the Bradlaugh-Besant trial of 1877 were not unrelated movements; they were connected with the lowered economic value of the child and with the corresponding desire to do without it. Thus conception of the lowered economic value of the child may have been a factor of moment when dealing with the textile areas of the north of England, but it is doubtful if it applied with the same force to Wales because before 1850 women and children were excluded from working underground in coal mines.

To enable us to understand more readily the movement of the birth-rate in Wales it is desirable to have some knowledge of the location of the principal industries. The geographical distribution of the main industries underwent little change during the period under review. In Glamorganshire there is a smaller proportion of workers on the land than in any other county, coal and iron being the main industries. In Carmarthenshire and Brecknockshire agriculture ranks with mining as the principal occupation. Cardiganshire, Pembrokeshire and Radnorshire are highly agricultural, the latter having the

largest proportion of land workers. The South Wales coalfield is often thought to produce coal for export only, but in fact a large proportion is used for industrial purposes at home and this was very much more so in the past. The old districts were built up to supply the demands of home industry and the collieries were owned mainly by the great ironmasters of South Wales, who considered them as subsidiary to their main business of making iron and steel. After the great slump in iron prices during the sixties, the ironmasters turned their attention to the sale of coal as a source of profit, a policy which has been continued ever since. They found it at once profitable because their mines were more fully developed than those which had been more recently started solely for the sale of coal and because they paid lower wages. By the end of the seventies the transference was complete, and thenceforward the destinies of the greater part of the coalfields were dependent more and more on the export trade. Between 1889 and 1913 the production of coal was more than doubled. During the whole period there had been a more or less acute shortage of labour, and the difficulties were enhanced by the shortage of housing. The pits were not sunk near large towns but in country districts, and to a very large extent labour had to be attracted to the spot from elsewhere. For this reason the cost of living in the mining villages had tended to be above the normal, and superadded to this was the fact that the fluctuating character of the export trade tended to make employment less stable than when the main coal trade was for the home market.

*Districts within the counties*

The discussion of the fertility within the counties can be confined to the actual birth-rate, since we have seen from Table I that the age distribution of the married women had undergone very little change during the 80 years. The legitimate birth-rate cannot be found for smaller areas than the whole country for the triennia of 1850-2 and 1900-2, because the number of married women under 45 was not stated in the census reports of 1851 and 1901, for finer geographical divisions. The census of 1921, owing to industrial disturbance, was taken in June, instead of in the early spring. Owing to the fact that the holiday season had commenced the population enumerated in holiday resorts was really overstated, with the consequence that fertility rates for these districts are understated. Moreover, the triennium 1920-2 included the latter part of the very steep rise in the birth-rate which occurred immediately after the War. For these reasons caution must be observed when drawing deductions from the rates for this period.

For the four triennia when the counties were divided into registration districts, four broad occupational groups have been used: (1) agricultural districts, with more than 40 per cent. of the male population engaged in this occupation in 1871; (2) mining districts, where more than 40 per cent. of the males were employed in mining in 1871; (3) mining and agricultural districts,

where the two occupations together formed the main source of male employment but neither employed 40 per cent. of the males; (4) other districts.

Table III. *South Wales. Legitimate birth-rates per 1000 married women, aged 15-45*

Registration county	1860-2	1870-2	1880-2	1890-2
Agricultural districts:				
Glamorganshire	—	—	—	—
Carmarthenshire	326	348	322	304
Pembrokeshire	327	334	325	300
Cardiganshire	318	314	301	281
Brecknockshire	302	306	295	282
Radnorshire	305	308	302	282
South Wales	315	320	307	288
Mining districts:				
Glamorganshire	306	320	305	320
Carmarthenshire	337	348	324	318
Pembrokeshire	—	—	—	—
Cardiganshire	—	—	—	—
Brecknockshire	307	318	299	305
Radnorshire	—	—	—	—
South Wales	310	324	307	319
Agricultural and mining districts:				
Glamorganshire	301	313	301	310
Carmarthenshire	326	336	318	297
Pembrokeshire	—	—	—	—
Cardiganshire	322	317	284	267
Brecknockshire	—	—	—	—
Radnorshire	—	—	—	—
South Wales	315	321	303	300
Other districts:				
Glamorganshire	287	295	301	282
Carmarthenshire	—	—	—	—
Pembrokeshire	308	316	319	290
Cardiganshire	—	—	—	—
Brecknockshire	—	—	—	—
Radnorshire	—	—	—	—
South Wales	293	300	305	283

The rates for these districts within the counties and for the whole of South Wales are set out in Table III. For the South Wales division as a whole the highest birth-rate is found in the mining districts and the lowest in the non-agricultural non-mining districts. The birth-rate for the districts where mining and agriculture were both of importance falls generally between the rate of the mainly mining and mainly agricultural districts.

The general tenor of Table III may be summarized as follows. In the earliest period taken, 1860-2, no very pronounced differences in fertility were shown between the various occupational and geographical areas. The extreme range was from 287 to 337 legitimate births per 1000 married women aged 15-45 (a difference of 50), and in 11 of the 13 divisions the rates lay between 301 and 327. Between 1860-2 and 1890-2, the first and last periods, the only areas which failed to show a decline in the birth-rate were the mining, and agricultural and mining districts of Glamorgan. The range had not changed,



410 *Declining Birth-Rate: Wales and S. England*

being from 267 to 320 (a difference of 53), but the rates tended to be more scattered throughout the range than in the earlier triennium.

The highest birth-rate in the four triennia was, on the whole, that of 1870-2. The exceptions were the agricultural, and agricultural and mining districts of Cardiganshire, in which districts the rate declined continuously throughout the period under review, and the districts with no specific general occupation in Glamorgan and Pembroke which had their maximum rate in 1890-2.

Taking South Wales as a whole the greatest decline in the rate took place in the agricultural districts, while the mining areas maintained or even increased their earlier rate.

Table IV. *South Wales. Urban districts and county boroughs.*  
*Legitimate birth-rates per 1000 married women, aged 15-45*

Administrative county	1911-13	1920-2	1930-2
<b>Mining districts:</b>			
Glamorganshire	250	213	130
Carmarthenshire	238	185	109
Pembrokeshire	—	—	—
Cardiganshire	—	—	—
Brecknockshire	240	200	136
Radnorshire	—	—	—
South Wales	250	212	129
<b>Metal-working districts:</b>			
Glamorganshire	231	173	—
Carmarthenshire	232	190	111
Pembrokeshire	—	—	—
Cardiganshire	—	—	—
Brecknockshire	—	—	—
Radnorshire	—	—	—
South Wales	232	187	111
<b>Mining and metal-working districts:</b>			
Glamorganshire	243	213	120
Carmarthenshire	248	233	115
Pembrokeshire	—	—	—
Cardiganshire	—	—	—
Brecknockshire	—	—	—
Radnorshire	—	—	—
South Wales	244	216	120
<b>Other districts:</b>			
Glamorganshire	208	186	126
Carmarthenshire	195	180	113
Pembrokeshire	211	194	139
Cardiganshire	170	122	105
Brecknockshire	190	177	119
Radnorshire	193	139	127
South Wales	206	184	126

From 1911 official statistics have been published in administrative districts. This classification made more areas within a county than the older method and allows the separation of the districts where metal working was the principal occupation, which the previous classification did not permit. The birth-rates for the urban districts and county boroughs are given in Table IV under

(1) mining districts, (2) districts where the main occupation was metal work, (3) districts where both mining and metal working were important sources of occupation, (4) other districts. The classification was made on the basis of the 1921 census and the mining districts and metal-working districts have

Table V. *South Wales. Rural districts. Legitimate birth-rates per 1000 married women, aged 15-45*

Administrative county	1911-13	1920-2	1930-2
Agricultural districts:			
Glamorganshire	—	—	—
Carmarthenshire	251	211	141
Pembrokeshire	233	200	144
Cardiganshire	211	199	146
Brecknockshire	211	200	156
Radnorshire	239	221	159
South Wales	234	206	146
Mining districts:			
Glamorganshire	254	220	137
Carmarthenshire	239	204	124
Pembrokeshire	—	—	—
Cardiganshire	—	—	—
Brecknockshire	258	203	125
Radnorshire	—	—	—
South Wales	251	215	131
Agricultural and mining districts:			
Glamorganshire	241	198	124
Carmarthenshire	—	—	—
Pembrokeshire	—	—	—
Cardiganshire	—	—	—
Brecknockshire	221	211	137
Radnorshire	—	—	—
South Wales	235	201	127
Mining and metal-working districts:			
Glamorganshire	246	190	116
Carmarthenshire	—	—	—
Pembrokeshire	—	—	—
Cardiganshire	—	—	—
Brecknockshire	—	—	—
Radnorshire	—	—	—
South Wales	246	190	116
Other districts:			
Glamorganshire	199	174	105
Carmarthenshire	—	—	—
Pembrokeshire	—	—	—
Cardiganshire	—	—	—
Brecknockshire	194	188	148
Radnorshire	—	—	—
South Wales	198	175	108

been taken as those where more than 40 per cent. of the males were engaged in either occupation. Table V gives the birth-rates for the three triennial periods in the rural areas. The counties have been divided into (1) agricultural districts, where more than 40 per cent. of the males were engaged in this occupation, (2) mining districts where more than 40 per cent. of the males

followed this occupation, (3) districts in which both agricultural and mining were important industries, (4) districts in which mining and metal working together employed the majority of the males, (5) other districts. The general conclusion that may be drawn from these tables may be summarized as follows.

In the different occupational divisions of South Wales as a whole, the decline in the birth-rate has been broadly equal in the urban and rural areas. For instance, in the mining districts the rate in 1930-2 was 48 per cent. below the rate in 1911-13 both in the urban and rural areas. In areas classed as mining and metal working the decline in the urban districts was 51 per cent. and in the rural districts 53 per cent. In the "other" occupational districts the decline was 39 per cent. in the urban districts and 45 per cent. in the rural districts.

The decline also did not differ very appreciably between the occupational divisions. It was least in the agricultural and "other" areas where it amounted to a little over 40 per cent. and most in the metal, and mining and metal areas where it reached just over 50 per cent.

In 1911-13 the highest birth-rates were recorded in the mining districts. In 1930-2 these districts still showed higher rates than in any other occupational divisions with the exception of agriculture. Owing to the somewhat slower rate of decline in the latter, these now had the highest rates.

Comparison of the counties shows that within the occupational divisions the amount of decline varied but not very materially, with the possible exception of Brecknock, where in some occupational divisions the fall was relatively slight. For instance, in mining divisions the decline varied between 54 per cent. in Carmarthen urban areas and 43 per cent. in Brecknock urban areas; in the "other" divisions between 47 per cent. in Carmarthen rural areas and 34 per cent. in Pembroke and Radnor urban areas (excluding Brecknock rural areas); in agricultural divisions between 44 per cent. in Carmarthen and 31 per cent. in Cardigan (again excluding Brecknock).

An attempt was made to study the birth-rates for each individual administrative district within the county. It was found that the lowest birth-rate for the urban areas occurs in those districts which have the highest proportion of women engaged in personal service and the largest percentage of males employed in commerce and finance. This experience was common to the six counties in South Wales.

### *Population*

The movement of the population within the country is an interesting feature of the South Wales population, the highly industrialized county of Glamorganshire attracting workers from other counties. The population at the end of the period, expressed as a percentage of the population at the beginning of the two periods for which the birth-rates have been discussed in occupational groups, is shown as follows:

County	Population of 1891 as a percentage of 1861	Population of 1931 as a percentage of 1911
Glamorganshire	216	109
Carmarthenshire	117	112
Pembrokeshire	93	97
Cardiganshire	87	92
Brecknockshire	93	97
Radnorshire	86	94
England and Wales	145	111

Pembrokeshire and Brecknockshire showed a decreasing population at each census 1861 to 1891, while the population of Radnorshire was the same for 1861 and 1871, and the population of Cardiganshire was greater in 1871 than in 1861. If a larger proportion of young people migrate in search of employment than older persons, which is clearly likely, it would explain in part the higher potential birth-rates found in Glamorganshire and Carmarthenshire than in the rest of South Wales.

II. NORTH WALES

*Fertility*

The actual rate, potential rate and fertility ratio in the counties of North Wales for the nine triennia under consideration are shown in Table VI. The highest fertility for the three periods 1890-2, 1900-2 and 1911-13 was found in the mining centre of Flintshire and Denbighshire, but in 1920-2 and 1930-2 the first place was taken by the agricultural county of Montgomeryshire. With

Table VI. *North Wales. 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.
Montgomeryshire	291	240	121	303	249	122	309	248	125
Flintshire	283	248	114	299	248	121	310	252	123
Denbighshire	270	246	110	290	253	115	308	250	123
Merionethshire	280	239	117	294	242	121	311	254	122
Carnarvonshire	297	246	121	283	245	116	290	248	117
Anglesey	268	248	108	255	241	106	277	244	114
County	1880-2			1890-2			1900-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Montgomeryshire	292	245	119	273	242	113	253	239	106
Flintshire	284	246	115	286	247	116	254	249	102
Denbighshire	289	248	117	282	250	113	265	250	106
Merionethshire	287	249	115	255	239	107	248	244	102
Carnarvonshire	272	250	109	237	242	98	227	244	93
Anglesey	275	249	110	241	244	99	224	244	92
County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Montgomeryshire	212	233	91	205	236	87	153	236	65
Flintshire	225	238	95	181	237	76	134	242	55
Denbighshire	213	237	90	182	239	76	133	240	55
Merionethshire	182	228	80	173	229	76	138	236	59
Carnarvonshire	174	231	75	150	230	65	126	238	53
Anglesey	195	234	83	182	235	77	139	235	59

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

Table VI (continued)

County	Urban districts								
	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Montgomeryshire	193	234	82	187	235	80	123	233	53
Flintshire	227	241	94	166	237	70	130	244	53
Denbighshire	187	234	80	150	236	64	121	237	51
Merionethshire	178	227	78	160	228	70	134	237	57
Carnarvonshire	162	230	70	126	232	54	114	240	48
Anglesey	188	234	80	183	236	78	128	235	54

County	Rural districts								
	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Montgomeryshire	224	234	96	216	237	91	172	237	73
Flintshire	223	236	95	192	236	81	137	242	57
Denbighshire	225	239	94	200	240	83	140	241	58
Merionethshire	185	228	81	185	231	80	141	235	60
Carnarvonshire	185	232	80	179	228	79	141	235	60
Anglesey	200	234	85	182	235	77	146	235	62

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

the exception of the first triennium the fertility in Carnarvonshire was very low throughout, the actual rate being the lowest for five out of the eight triennia and lowest but one three times. The actual rate and fertility ratio was usually higher in the rural districts than in the urban districts of each county for the last three periods, when this division was possible. The exceptions were the actual rate of Flintshire in 1911-13 and the actual rate and fertility ratio of Anglesey in 1920-2. The fertility rates expressed as percentages of those in 1870-2 are shown in Table VII. The actual birth-rate and fertility ratio show a decline of the order of 50 per cent. in all counties. The fertility

Table VII. North Wales. Legitimate birth-rates as percentages of those in 1870-72

County	1850-2			1860-2			1870-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Montgomeryshire	94.2	96.8	96.8	98.1	100.4	97.6	100	100	100
Flintshire	91.3	98.4	92.7	96.5	98.4	98.4	100	100	100
Denbighshire	87.7	98.4	89.4	94.2	101.2	93.5	100	100	100
Merionethshire	90.0	94.1	95.9	94.5	95.3	99.2	100	100	100
Carnarvonshire	102.4	99.2	103.4	97.6	98.8	99.1	100	100	100
Anglesey	96.8	101.6	94.7	92.1	98.8	93.0	100	100	100

County	1880-2			1890-2			1900-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Montgomeryshire	94.5	98.8	95.2	88.3	97.6	90.4	81.9	96.4	84.8
Flintshire	91.6	97.6	93.5	92.3	98.0	94.3	81.9	98.8	82.9
Denbighshire	93.8	99.2	95.1	91.6	100.0	91.9	86.0	100.0	86.2
Merionethshire	92.3	98.0	94.3	82.0	94.1	87.7	79.7	96.1	83.6
Carnarvonshire	93.8	100.8	93.2	81.7	97.6	83.8	78.3	98.4	79.5
Anglesey	99.3	102.0	96.5	87.0	100.0	86.8	80.9	100.0	80.7

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

Table VII (*continued*)

County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Montgomeryshire	68.6	94.0	72.8	66.3	95.2	69.6	49.5	95.2	52.0
Flintshire	72.6	94.4	77.2	58.4	94.0	61.8	43.2	96.0	44.7
Denbighshire	69.2	94.8	73.2	59.1	95.6	61.8	43.2	96.0	44.7
Merionethshire	58.5	89.8	65.6	55.6	90.2	62.3	44.4	92.9	48.4
Carnarvonshire	60.0	93.1	64.1	51.7	92.7	55.6	43.4	96.0	45.3
Anglesey	70.4	95.9	72.8	65.7	96.3	67.5	50.2	96.3	51.8

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

declined most rapidly in Merionethshire and Carnarvonshire up to 1920-2. The percentage fall was slowest in Flintshire and Denbighshire until 1911-13, but the rate of decline was greatest there in the last 20 years. The total decrease for the last two periods was 29.4 and 26.0 per cent. of the 1870-2 rate respectively as compared with 14.1 and 16.6 per cent. for Merionethshire and Carnarvonshire.

#### *Occupations*

In 1871 the counties of Montgomeryshire and Anglesey were essentially agricultural, as 43.6 and 38.4 per cent. of the adult male population were engaged on the land. Merionethshire and Carnarvonshire were slightly less agricultural, and they had an additional occupation in stone and slate quarrying. Flintshire and Denbighshire were the centres of the North Wales coalfield. In 1921 the main occupations of the counties were still the same, although the proportion of men employed in mining in Flintshire had greatly decreased. Despite the decrease in popularity of slate as a roofing material, half the male population of Ffestiniog in Merionethshire was still engaged in mining and quarrying.

#### *Districts within the counties*

For the four triennia when official statistics were published for registration districts, the four occupational groups used in the preceding discussion on South Wales were again employed. The birth-rates for these districts within the counties of North Wales are set out in Table VIII. The highest birth-rates for the area as a whole are found in the mining districts and the next largest in the agricultural areas. The lowest rate was that in the districts where no specific occupation predominated.

With the possible exception of Anglesey in the first two triennial periods, no very pronounced differences existed between the various occupational and geographical areas. In the first period, 1860-2, the extreme range was from 255 to 321 legitimate births per 1000 married women aged 15-45. The birth-rates in 1890-2 showed a decline from the rates of 1860-2 for each occupational district, with the exception of the mining district of Denbighshire. The range for the last period was from 236 to 305. For the first and last triennia the range was larger but on a slightly lower level than that shown in South Wales for the corresponding periods.

Table VIII. *North Wales. Legitimate birth-rate per 1000 married women, aged 15-45*

Registration county	1860-2	1870-2	1880-2	1890-2
<b>Agricultural districts:</b>				
Montgomeryshire	307	314	302	281
Flintshire	—	—	—	—
Denbighshire	284	284	282	254
Merionethshire	279	304	279	252
Carnarvonshire	272	290	280	241
Anglesey	—	—	—	—
North Wales	289	301	287	259
<b>Mining districts:</b>				
Montgomeryshire	—	—	—	—
Flintshire	—	—	—	—
Denbighshire	298	325	295	305
Merionethshire	—	—	—	—
Carnarvonshire	—	—	—	—
Anglesey	—	—	—	—
North Wales	298	325	295	305
<b>Agricultural and mining districts:</b>				
Montgomeryshire	298	302	279	262
Flintshire	299	310	284	286
Denbighshire	280	292	284	250
Merionethshire	321	320	296	260
Carnarvonshire	285	290	270	236
Anglesey	—	—	—	—
North Wales	292	300	279	253
<b>Other districts:</b>				
Montgomeryshire	—	—	—	—
Flintshire	—	—	—	—
Denbighshire	—	—	—	—
Merionethshire	—	—	—	—
Carnarvonshire	—	—	—	—
Anglesey	255	277	275	241
North Wales	255	277	275	241

The highest birth-rate in the four triennia in the occupational districts was that of 1870-2, with the exception of the agricultural and mining areas of Merionethshire where the rate declined continuously throughout the period. In none of the occupational divisions of North Wales as a whole was there a pronounced change in the birth-rate between 1860-2 and 1890-2. In the agricultural and agricultural and mining districts the fall amounted to 10 and 13 per cent. respectively; in "other" districts to only 5 per cent.; while in the mining areas of Denbighshire there was no appreciable change at all, the rate fluctuating over the 30 years. Within the occupational divisions of the counties the decline was mainly of the order of 5-10 per cent., though it reached nearly 20 per cent. in the agricultural districts of Merionethshire and Carnarvonshire.

The birth-rates for administrative districts, grouped in occupations, are given for the urban districts in Table IX and for the rural districts in Table X. In the urban areas a district classified as mining had at least 40 per cent. of the males engaged in this industry in 1921. In the remaining districts there was no outstanding single occupation, but some of the areas had a number of males engaged on the land, and of these districts those with at least 20 per

Table IX. *North Wales. Urban districts. Legitimate birth-rate per 1000 married women, aged 15-45*

Administrative county	1911-13	1920-2	1930-2
<b>Agricultural districts:</b>			
Montgomeryshire	192	189	134
Flintshire	—	—	—
Denbighshire	183	194	152
Merionethshire	152	140	125
Carnarvonshire	—	—	—
Anglesey	199	172	144
North Wales	182	178	139
<b>Mining districts:</b>			
Montgomeryshire	—	—	—
Flintshire (coal)	251	222	145
Denbighshire	—	—	—
Merionethshire (slate)	192	198	139
Carnarvonshire (slate)	188	188	137
Anglesey	—	—	—
North Wales (slate)	190	195	139
(coal)	251	222	145
(all)	211	205	141
<b>Other districts:</b>			
Montgomeryshire	194	187	113
Flintshire	221	156	127
Denbighshire	187	145	117
Merionethshire	170	128	132
Carnarvonshire	159	122	112
Anglesey	187	184	126
North Wales	184	144	119

Table X. *North Wales. Rural districts. Legitimate birth-rates per 1000 married women, aged 15-45*

Administrative county	1911-13	1920-2	1930-2
<b>Agricultural districts:</b>			
Montgomeryshire	224	216	172
Flintshire	201	175	124
Denbighshire	213	192	140
Merionethshire	181	183	138
Carnarvonshire	195	187	149
Anglesey	200	182	146
North Wales	205	192	148
<b>Mining districts:</b>			
Montgomeryshire	—	—	—
Flintshire	—	—	—
Denbighshire (coal)	230	203	141
Merionethshire	—	—	—
Carnarvonshire	—	—	—
Anglesey	—	—	—
North Wales (coal)	230	203	141
<b>Mining and agriculture:</b>			
Montgomeryshire	—	—	—
Flintshire (coal)	226	196	151
Denbighshire (coal)	211	183	132
Merionethshire (slate)	197	190	147
Carnarvonshire (slate)	181	175	137
Anglesey	—	—	—
North Wales (slate)	183	177	138
(coal)	224	194	149
(all)	197	183	143
<b>Other districts:</b>			
Montgomeryshire	—	—	—
Flintshire	229	197	131
Denbighshire	—	—	—
Merionethshire	—	—	—
Carnarvonshire	—	—	—
Anglesey	—	—	—
North Wales	229	197	131



cent. of the males so employed have been grouped under agricultural districts. In the rural areas a district has been described as agricultural if it had at least 40 per cent. of the male population engaged in this occupation in 1921; the mining districts were those areas in which at least 40 per cent. of the males were employed in this industry; districts have been described as mining and agricultural when both industries were important occupations; the remaining districts with no predominant occupation have been grouped together under "other" districts.

Tables IX and X show that the decline in the birth-rate had been slightly greater in each occupational division in the rural areas than in the urban areas.

The least decline had taken place in the agricultural areas, where it was of the order 25-30 per cent., compared with 35-40 per cent. in the mining areas and 35-45 per cent. in the "other" areas. In the mining areas and in the agricultural and mining areas the birth-rate declined more in the coal-mining districts than in the stone- and slate-quarrying districts.

In 1911-13 fertility was highest in the mining and lowest in the agricultural areas. Owing to the smaller decrease in the latter, the rates in 1930-2 did not differ appreciably between these two divisions.

Within the smaller occupational divisions of the counties considerable variability was apparent, but in no area was there an absence of substantial decline. The least fall (in the urban agricultural areas of Denbighshire and Merionethshire) amounted to nearly 20 per cent., and the maximum, in several areas, to a little over 40 per cent. The majority of the districts showed a decline of 25-35 per cent.

The lowest fertility in the individual administrative districts was found in those areas with the highest proportion of males engaged in commerce and finance and the largest percentage of females employed in personal service.

### *Population*

The population of North Wales did not show such variation as did the population of South Wales, but the drift from the agricultural areas is in evidence. The population at the end of the periods for which the counties were divided into occupational groups, expressed as a percentage of that at the beginning, is:

County	Population of 1891 as a percentage of 1861	Population of 1931 as a percentage of 1911
Montgomeryshire	87	91
Flintshire	111	122
Denbighshire	117	109
Merionethshire	126	95
Carnarvonshire	124	97
Anglesey	92	96
England and Wales	145	111

The rate of increase is below that for England and Wales with one exception. The two counties which showed a loss in 1861-91 were the least industrialized counties. The population of 1891 was less than that of 1881 in the counties

of Flintshire, Merionethshire and Carnarvonshire. The counties of Flintshire and Denbighshire which showed an increase during 1911–31 had the highest potential birth-rate during this period.

*General remarks on Wales*

The decline in the birth-rate of the country as a whole may be said to have started during the decade 1870–2 to 1880–2, although in some districts it did not occur until later. The rate of decrease has not been uniform throughout the period under review, as during the last 30 years, 1901–31, it was twice as great as that which had taken place in the previous 30 years, 1871–1901. As a result of this downward trend, the fertility in 1930–2 was less than 50 per cent. of that which existed 60 years previously. The change in the age constitution of the married women, due to later age at marriage, was not a factor of any appreciable importance in the decline, since the potential birth-rate in 1930–2 was only 5 per cent. in defect of that of 1870–2.

The birth-rate in the rural districts was higher than in the urban districts, except in Glamorganshire, where both rates were equal. In Glamorganshire the main occupation of the males in both urban and rural districts was mining, with metal workers as an important additional group; only 8 per cent. of the males in the rural districts were engaged in agriculture.

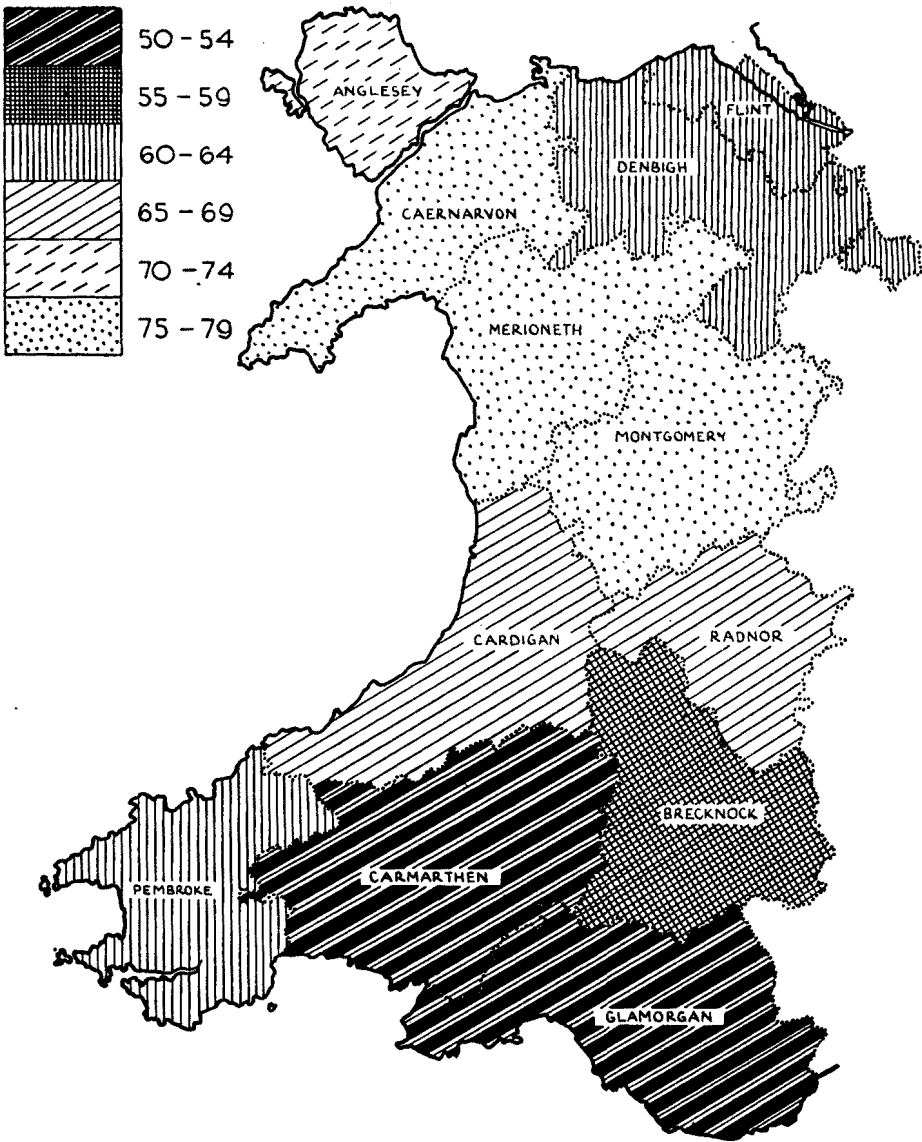
To illustrate more readily the rapid decline in fertility during the past 20 years, the actual birth-rate of 1930–2 expressed as a percentage of that of 1911–13 for both urban and rural districts is shown in the sketch maps. It will be seen that the greatest decline in both urban and rural districts occurred in South Wales, where the recent trade depression has been most severe. In the urban districts the birth-rate has declined most in the highly industrialized counties of Glamorganshire and Carmarthenshire, where the fall was 48 and 54 per cent. of the 1911–13 values respectively. In contrast with this experience it will be noted that the decrease was smaller, 25 and 30 per cent., in the counties of Merionethshire and Carnarvonshire where slate and stone quarrying were the principal male occupations.

In rural districts the largest fall in the birth-rate, 47 per cent., occurred in Glamorganshire and Carmarthenshire; Montgomeryshire, with the largest proportion of agricultural workers in the Welsh rural divisions, experienced the smallest decline in the birth-rate, 23 per cent. The counties of Carnarvonshire and Merionethshire had a decline of only 24 per cent. Agriculture was the primary occupational group in the rural districts of these counties, but an important proportion of the males was engaged in slate and stone quarrying.

The average age of the married women varied in the different counties. In Glamorganshire the women marry earlier than in any other county and in Cardiganshire later. As a consequence the highest potential birth-rate was found in the former and the lowest in the latter. Despite the advantage of younger women, the actual birth-rate in Glamorganshire only exceeded that

# WALES — RURAL DISTRICTS

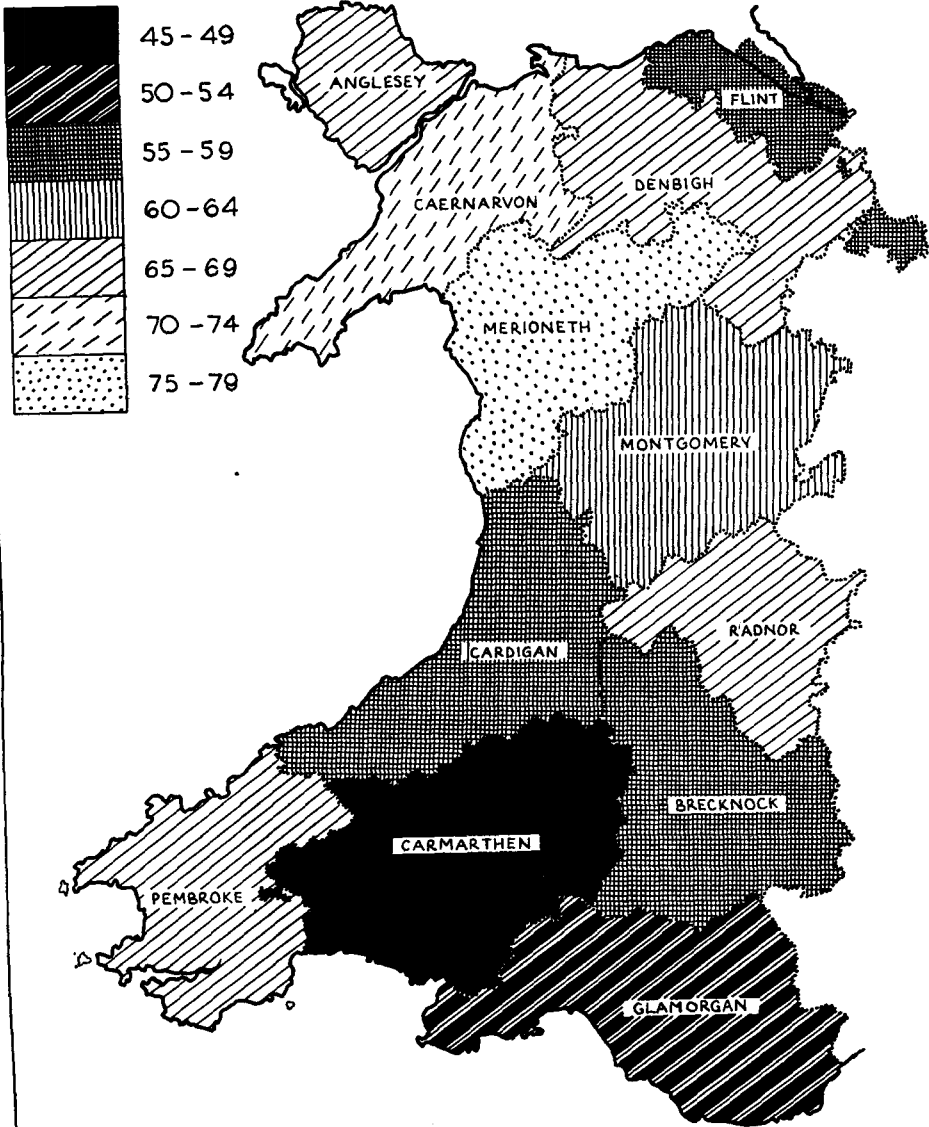
SHOWING THE LEGITIMATE BIRTH RATE OF 1930-32  
EXPRESSED AS A PERCENTAGE OF THAT OF 1911-13.



Map 1.

# WALES - URBAN DISTRICTS

SHOWING THE LEGITIMATE BIRTH RATE OF 1930 - 32  
EXPRESSED AS A PERCENTAGE OF THAT OF 1911 - 13.



Map 2.

of Cardiganshire in five out of the nine triennial periods, and in only two periods was the fertility ratio of Glamorganshire the greater.

A very low fertility occurred in the administrative districts, in combination with a high proportion of males engaged in commerce and finance and a high proportion of females employed in personal service.

For the districts examined according to occupation the highest birth-rate in each period 1860–90 in the registration districts was that of the mining areas. The rates for the mainly agricultural and mining and agricultural districts varied, in some periods the former was higher and in some the latter. The decline in the birth-rate was less in the mining areas than in the agricultural districts. The coal-mining districts also had the highest rate in the urban administrative districts. The birth-rates in these districts and in the metal-working districts and the mining and metal-working districts, which also had a high rate in 1911–13, fell by approximately one-half. The result of this heavy fall was that the urban agricultural districts and stone- and slate-quarrying districts of North Wales which had a relatively low birth-rate in 1911–13 had the highest in 1930–2. The highest birth-rate for the first two triennia in the rural districts was that of the mining areas, but in the third the agricultural districts had a higher rate.

### III. SOUTH-WESTERN COUNTIES

#### *Fertility*

The actual rate, potential rate and fertility ratio are given for the south-western counties in Table XI. The fertility rates for Cornwall are interesting, for the decline in the birth-rate appears to have commenced prior to 1850–2. The rates in this county differed in this respect from those observed in other counties where the decline in fertility first appeared between 1870 and 1880. Despite this earlier fall the birth-rate in Cornwall was the highest in the division for the first two triennia, while in the other seven triennia the highest birth-rate was found in Wiltshire or Somersetshire. The lowest actual birth-rate and fertility ratio for each of the nine triennia was found in Devonshire. This county had the smallest proportion of agricultural workers in the division. The variation in the potential birth-rate between the counties was small. The fertility for 1880–2 showed a decline on the value for 1870–2 for all counties except Devonshire. The birth-rate was higher in the rural areas than in the urban for the last three triennia where the counties were subdivided. The county boroughs of Devonshire had a fertility in excess of that of the urban districts but not of the rural, and the potential birth-rate was higher than either the urban or rural areas. The birth-rate for the county boroughs in Somersetshire was less than that for the rural and urban areas except for the urban rate for 1920–2.

The birth-rates and fertility ratio expressed as a percentage of 1870–2 are shown in Table XII. The actual birth-rate declined by 60 per cent. during the

Table XI. *South-western counties. 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.
Wiltshire	289	253	114	286	248	115	298	249	120
Dorsetshire	293	249	118	287	250	115	289	250	116
Devonshire	277	249	111	278	251	111	274	253	108
Cornwall	313	252	124	310	255	122	294	252	117
Somersetshire	288	249	116	283	251	113	293	253	116

County	1880-2			1890-2			1900-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Wiltshire	292	250	117	261	247	106	225	243	93
Dorsetshire	286	250	114	255	247	103	216	243	89
Devonshire	286	252	114	252	251	100	208	246	85
Cornwall	288	248	116	262	250	105	220	243	91
Somersetshire	292	251	116	268	250	107	221	243	91

County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Wiltshire	187	239	78	176	239	74	123	242	51
Dorsetshire	180	239	75	164	238	69	122	244	50
Devonshire	171	241	71	158	240	66	112	242	46
Cornwall	178	241	74	167	241	69	116	241	48
Somersetshire	177	237	75	164	237	69	116	239	49

County boroughs

County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Wiltshire	—	—	—	—	—	—	—	—	—
Dorsetshire	—	—	—	—	—	—	—	—	—
Devonshire	174	248	70	164	245	67	115	248	46
Cornwall	—	—	—	—	—	—	—	—	—
Somersetshire	160	236	68	154	235	66	106	236	45

Urban districts

County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Wiltshire	174	239	73	164	237	69	113	241	47
Dorsetshire	174	243	72	155	239	65	115	245	47
Devonshire	167	238	70	141	236	60	101	239	42
Cornwall	177	242	73	160	241	66	116	242	48
Somersetshire	171	239	72	151	237	63	109	239	46

Rural districts

County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Wiltshire	198	239	83	187	240	78	133	243	55
Dorsetshire	188	235	80	177	237	75	124	243	51
Devonshire	178	247	72	166	236	70	119	237	50
Cornwall	178	241	74	173	241	72	116	241	48
Somersetshire	189	236	80	178	237	75	123	239	52

A. = Actual rate; P. = Potential rate; F.R. = Percentage fertility ratio.

Table XII. *South-western counties. Legitimate birth-rates expressed as percentages of those for 1870-2*

County	1850-2			1860-2			1870-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Wiltshire	97.0	101.6	95.0	96.0	99.6	95.8	100.0	100.0	100.0
Dorsetshire	101.4	99.6	101.7	99.3	100.0	99.1	100.0	100.0	100.0
Devonshire	101.1	98.4	102.8	101.5	99.2	102.8	100.0	100.0	100.0
Cornwall	106.5	100.0	106.0	105.4	101.2	104.3	100.0	100.0	100.0
Somersetshire	98.3	98.4	100.0	96.6	99.2	97.4	100.0	100.0	100.0

County	1880-2			1890-2			1900-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Wiltshire	98.0	100.4	97.5	87.6	99.2	88.3	75.5	97.6	77.5
Dorsetshire	99.0	100.0	98.3	88.2	98.8	88.8	74.7	97.2	76.7
Devonshire	104.4	99.6	105.6	92.0	99.2	92.6	75.9	97.2	78.7
Cornwall	98.0	98.4	99.1	89.1	99.2	89.7	74.8	96.4	77.8
Somersetshire	99.7	99.2	100.0	91.5	98.8	92.2	75.4	96.0	78.4

County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Wiltshire	62.8	96.0	65.0	59.1	96.0	61.7	41.3	97.2	42.5
Dorsetshire	62.3	95.6	64.7	56.7	95.2	59.5	42.2	97.6	43.1
Devonshire	62.4	95.3	65.7	57.7	94.9	61.1	40.9	95.6	42.6
Cornwall	60.5	95.6	63.2	56.8	95.6	59.0	39.5	95.6	41.0
Somersetshire	60.4	94.5	64.7	56.0	94.5	59.5	39.6	95.3	42.2

A. = Actual rate; P. = Potential rate; F.R. = Percentage fertility ratio.

60 years 1870-1930 and the potential rate had fallen by less than 5 per cent., so that the alteration in the age constitution of the married women cannot be accepted as the explanation of the fall in the birth-rate. The percentage fall was greatest in Cornwall and Somersetshire and least in Dorsetshire. The percentage decline in the 1900-2 fertility was greater than that for the preceding and succeeding triennia for every county except Wiltshire. The percentage fall in the birth-rates in the division for 1920-2 from the preceding triennia was less than half that between the three preceding triennia and about 5 per cent. of the 1870-2 rate. The fertility values for 1930-2 showed a very large drop from the preceding triennia, the fall being about 17 per cent. of the 1870-2 values.

#### Occupations

There was no industry in the south-western division approaching the importance of mining in Wales; the manufactures were limited and the variety of industries which existed in this division was localized. Agriculture was the chief single occupation for males in each of the five counties, Wiltshire, Dorsetshire, Devonshire, Cornwall and Somersetshire, which composed the south-western division. Dairy farming was a very important branch of agriculture, and orchards, especially the cider apple orchards, and gardens covered a considerable area in Somersetshire, Cornwall and Devonshire, the latter county being a close rival to Kent for orchard area. In the south of Cornwall early flowers, fruits and vegetables were extensively cultivated.

The mineral resources of this division are varied. The most important from the occupational viewpoint was coal mining in Somersetshire and the working of tin, copper, clay and stone in Cornwall. In 1851 just over 5000 males were engaged in coal mining in Somersetshire, and in 1931 this number had decreased by one fifth. Over 30,000 males were returned as copper, tin and lead miners in Cornwall for the census of 1851, but in 1931 the number had fallen to only one-twelfth of the 1851 figure. Minerals were worked in various parts of the division, but the numbers of males employed in this occupation are relatively small in any particular administrative district, e.g. the number of males engaged in the stone quarries of Portland, Dorsetshire, formed only 9.3 per cent. of the male population in 1921. Fishing employed a considerable number of men in Devonshire, Dorsetshire and Cornwall, but it is only in the last county that administrative districts existed where this occupation was the predominant one. The pilchard fishing of Cornwall was the most noteworthy of the fishing industry. A large proportion of the male population for some districts was employed in public administration and defence; these occupations were not important ones in Wales.

*Districts within the counties*

For the four registration periods the districts have been grouped into broad occupational groups. The agricultural districts are those where over 40 per cent. of the male population was engaged on the land in 1871. The mining and agricultural areas were those where these two occupations together formed the main source of employment. Two districts in Devonshire had half the male population employed in the defence services and a separate group has been made for these districts, since they are less likely to be affected by the vagaries of trade booms and depressions than other occupations. The remaining districts which had no outstanding industry have been grouped together. The birth-rates for these occupational districts are given in Table XIII. For the division as a whole the highest birth-rates were those in the mainly agricultural and the mining and agricultural districts. The birth-rate in the areas with no specific occupation was below those of the agricultural districts for each of the four triennia. The districts with defence services as the main source of employment had a birth-rate which was considerably less than that of any of the other groups for each period.

The legitimate births per 1000 married women, aged 15–45, ranged from 275 to 315 in the earliest period 1860–2 and from 248 to 294 in the last triennium 1890–2, excluding the garrison districts of Devonshire from both ranges. The rate for the last period showed an appreciable decline on the rate for the first period, with the exception of the coal-mining district of Somersetshire.

The majority of the occupational divisions had the highest rate during these four triennia in 1870–2. The rate of 1890–2 showed a decline in every district on the value for the previous triennia. The rate of 1870–2 for the agricultural district of Cornwall showed a slight rise from 1860–2, but for



Table XIII. *South-western counties. Legitimate birth-rates per 1000 married women, aged 15-45*

Registration county	1860-2	1870-2	1880-2	1890-2
<b>Defence services:</b>				
Wiltshire	—	—	—	—
Dorsetshire	—	—	—	—
Devonshire	245	251	262	236
Cornwall	—	—	—	—
Somersetshire	—	—	—	—
South-western counties	245	251	262	236
<b>Mining and agricultural districts:</b>				
Wiltshire	—	—	—	—
Dorsetshire	—	—	—	—
Devonshire	—	—	—	—
Cornwall	315	295	289	264
Somersetshire	298	305	318	294
South-western counties	313	297	294	270
<b>Agricultural districts:</b>				
Wiltshire	288	298	292	266
Dorsetshire	284	285	287	257
Devonshire	302	310	304	267
Cornwall	300	305	296	265
Somersetshire	290	302	296	266
South-western counties	293	301	296	264
<b>Other districts:</b>				
Wiltshire	284	298	291	258
Dorsetshire	291	292	286	253
Devonshire	275	263	283	251
Cornwall	292	274	272	248
Somersetshire	280	290	288	264
South-western counties	280	280	286	257

the other two occupational divisions in this county the rate declined continuously throughout the 30 years.

The birth-rates for the urban administrative districts are set out in Table XIV and the rates for the rural areas are shown in Table XV. In some of the urban districts of Cornwall and Devon the proportion of males engaged in agriculture was fairly high, and those districts where more than 20 per cent. were employed on the land have been grouped together as agricultural districts. The mining districts in the urban areas of Somersetshire had over half the male population engaged in coal mining in 1921, but the percentages ranged from 14 to 47 in Cornwall where tin, stone and clay were worked. The numbers employed in the defence services ranged from one-sixth to one-third of the male population in the various urban districts grouped under this heading. In the fishing districts of Cornwall the range of the males occupied in this calling was from 12 to 32 per cent. In the rural districts over half the males were employed on the land in the agricultural districts. The proportion of the males employed in the defence services, in the rural districts that have been grouped together, ranged from 23 to 58 per cent. In the rural mining districts the proportion employed in this occupation varied from 16 to 41 per cent.

The birth-rate in the rural districts was in excess of that of the urban areas

Table XIV. *South-western counties. County boroughs and urban districts.*  
*Legitimate birth-rates per 1000 married women, aged 15-45*

Administrative county	1911-13	1920-2	1930-2
<b>Public administration and defence:</b>			
Wiltshire	—	—	—
Dorsetshire	—	—	—
Devonshire	175	163	115
Cornwall	163	151	107
Somersetshire	—	—	—
South-western counties	175	163	115
<b>Mining districts:</b>			
Wiltshire	—	—	—
Dorsetshire	—	—	—
Devonshire	—	—	—
Cornwall	200	178	122
Somersetshire	203	169	116
South-western counties	201	175	120
<b>Fishing districts:</b>			
Wiltshire	—	—	—
Dorsetshire	—	—	—
Devonshire	—	—	—
Cornwall	176	161	107
Somersetshire	—	—	—
South-western counties	176	161	107
<b>Agricultural districts:</b>			
Wiltshire	—	—	—
Dorsetshire	—	—	—
Devonshire	173	176	112
Cornwall	182	178	128
Somersetshire	—	—	—
South-western counties	175	176	116
<b>Other districts:</b>			
Wiltshire	174	164	113
Dorsetshire	174	155	115
Devonshire	158	144	104
Cornwall	169	152	117
Somersetshire	166	151	108
South-western counties	166	152	109

in these three triennial periods. The highest birth-rate was that of the rural garrison districts, and the lowest was in the urban fishing districts.

The decline in the birth-rate was approximately the same in the occupational divisions and in the urban and rural areas, and was of the order of 35 per cent. The greatest decline was in the urban occupational areas of mining and fishing, where it was 40 and 39 per cent. respectively.

There was no difference in the rate of fall in the birth-rate between the various districts in the same occupational group. The only appreciable difference in the decline between urban and rural rates was that of the mining areas of Somerset, where the birth-rate in 1930-2 of the rural mining areas was in excess of the urban, whereas in 1911-13 the rural rate was less than that of the urban.

The combination found in Wales of a low birth-rate and a large proportion of males engaged in commerce and finance, and a high percentage of females employed in personal service is not exhibited generally in this division, and Somersetshire was the only county which had this combination.

Table XV. *South-western counties. Rural districts. Legitimate birth-rates per 1000 married women, aged 15-45*

Administrative county	1911-13	1920-2	1930-2
<b>Public administration and defence:</b>			
Wiltshire	223	199	155
Dorsetshire	193	177	130
Devonshire	—	—	—
Cornwall	172	170	106
Somersetshire	—	—	—
South-western counties	203	187	139
<b>Mining districts:</b>			
Wiltshire	—	—	—
Dorsetshire	—	—	—
Devonshire	—	—	—
Cornwall	186	183	121
Somersetshire	186	183	128
South-western counties	186	183	124
<b>Agricultural districts:</b>			
Wiltshire	192	181	130
Dorsetshire	189	180	127
Devonshire	181	167	122
Cornwall	184	173	120
Somersetshire	188	182	124
South-western counties	186	176	124
<b>Other districts:</b>			
Wiltshire	195	187	124
Dorsetshire	184	170	117
Devonshire	174	165	115
Cornwall	165	162	108
Somersetshire	182	170	120
South-western counties	180	171	117

*Population*

The population of the counties in this division, with the exception of Cornwall, showed a steady increase during the periods under review, but the rate of increase was much below that of England and Wales. The population of Cornwall declined continuously for these periods. The population at the end of the periods for which occupational districts were discussed, expressed as a percentage of the population at the beginning, is:

County	Population of 1891 as a percentage of 1861	Population of 1931 as a percentage of 1911
Wiltshire	106	106
Dorsetshire	103	107
Devonshire	108	105
Cornwall	87	97
Somersetshire	109	104
England and Wales	145	111

## IV. SOUTH-EASTERN COUNTIES

*Fertility*

The actual birth-rates, potential birth-rates and fertility ratios for the nine triennia for each county of the south-eastern division are given in Table XVI. The birth-rate and fertility ratio of Berkshire were higher than

Table XVI. *South-eastern counties. 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.
Surrey	274	251	109	278	257	108	285	257	111
Kent	288	256	113	281	258	109	289	259	112
Sussex	280	254	110	273	251	109	285	255	112
Hampshire	272	256	106	264	255	104	273	257	106
Berkshire	282	251	112	282	249	113	295	252	117

County	1880-2			1890-2			1900-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Surrey	284	252	113	244	248	98	208	246	85
Kent	288	256	113	256	252	102	221	252	88
Sussex	279	253	110	236	247	96	203	245	83
Hampshire	274	255	108	243	252	96	212	250	85
Berkshire	290	251	116	258	246	105	219	243	90

County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Surrey	170	238	71	153	233	66	108	241	45
Kent	177	242	73	161	241	67	116	244	47
Sussex	160	237	68	142	235	60	110	240	46
Hampshire	180	246	73	163	242	67	121	245	49
Berkshire	189	232	82	169	237	71	122	241	51

County boroughs									
County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Surrey	173	239	72	157	233	67	109	240	45
Kent	175	243	72	180	242	74	117	246	48
Sussex East	153	238	64	134	237	57	106	242	44
Sussex West	—	—	—	—	—	—	—	—	—
Hampshire	175	249	70	156	245	64	116	246	48
Berkshire	193	240	80	167	238	70	118	238	50

Urban districts									
County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Surrey	167	237	71	151	233	65	107	241	44
Kent	174	243	72	155	241	64	115	244	47
Sussex East	156	237	66	140	233	60	104	239	44
Sussex West	163	237	69	131	234	56	112	240	47
Hampshire	186	246	76	167	242	69	133	247	54
Berkshire	179	241	74	163	240	68	122	244	50

Rural districts									
County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Surrey	172	238	72	152	230	66	112	239	47
Kent	185	239	77	176	241	73	118	241	49
Sussex East	165	235	70	160	233	69	115	239	48
Sussex West	177	234	76	158	234	68	122	239	51
Hampshire	183	240	76	176	238	74	120	243	49
Berkshire	178	237	75	174	234	74	125	241	52

A. = Actual rate; P. = Potential rate; F.R. = Percentage fertility ratio.

those of any other county for each triennium, except the first when the birth-rate of Kent was highest. The potential rate of Berkshire was low, being the lowest in seven of the nine periods. The birth-rates for Hampshire were low until 1900-2, but for the last three periods the rate was the second largest in the division. The birth-rate for Sussex was low throughout the period under review. The highest potential rates were those of Kent and Hampshire.

The highest fertility among the county boroughs was found in the counties of Berkshire and Kent and the lowest in Sussex. The lowest birth-rate in the urban districts was that of Sussex and the highest was in Hampshire. The fertility in the rural districts showed considerable variation among the counties, that of Surrey being low and Kent, Hampshire and Berkshire each having the highest in one of the three periods. The actual birth-rate in the county boroughs of Surrey and Kent exceeded that of the urban districts for each of the three triennia and were above the rate of the rural districts twice in Surrey and once in Kent. The birth-rate of the county boroughs of Sussex East was below the urban rate for the first two periods and above for the last, and was in defect of the rural value for each triennium. The birth-rate of the county boroughs of Hampshire was below the urban and rural rates for each of the three periods. The county boroughs of Berkshire had a birth-rate greater than that of the urban and rural rates for the first period, in the second period it was above the urban but below the rural value, and in the last triennium it was below both the urban and rural rates. Berkshire was the only county where the potential rate of the county borough was below the rate for the urban districts for each triennial period. The potential birth-rates of the county boroughs were above the rates for the rural districts for each period, except that for Berkshire where it was below the rural rate in the last period. The fertility ratios of the county boroughs of Hampshire and Sussex were in defect of those of the urban and rural areas. In the other three counties the fertility ratio of the county boroughs was never below the value of the urban districts, but in each county the fertility ratio of the county boroughs exceeded that of the rural districts on one occasion. The birth-rates and fertility ratios of the urban districts of Surrey, Kent, Sussex East and Sussex West were below the values of the rural areas for each period. In the first of the three periods the birth-rate in the urban districts of Berkshire was greater than that of the rural and below in the other two triennia, while the urban rate of Hampshire was greater than the rural rate in the first and last triennia but below in the second. The potential birth-rate in the rural areas was below that of the urban districts in each county for each period, except that of Surrey where the urban rate was less in the first period.

The actual birth-rates, potential birth-rates and fertility ratios, expressed as a percentage of the 1870-2 values, are shown in Table XVII. This table shows that there has been a fall of 60 per cent. in the birth-rates and a fall of only about 6 per cent. in the potential birth-rate. The greatest percentage fall occurred in Surrey and the lowest in Hampshire. The rate of decrease has

Table XVII. *South-eastern counties. Legitimate birth-rates as percentages of those for 1870-2*

County	1850-2			1860-2			1870-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Surrey	96.1	97.7	98.2	97.5	100.0	97.3	100.0	100.0	100.0
Kent	99.7	98.8	100.9	97.2	99.6	97.3	100.0	100.0	100.0
Sussex	98.2	99.6	98.2	95.8	98.4	97.3	100.0	100.0	100.0
Hampshire	99.6	99.6	100.0	96.7	99.2	98.1	100.0	100.0	100.0
Berkshire	95.6	99.6	95.7	95.6	98.8	96.6	100.0	100.0	100.0

County	1880-2			1890-2			1900-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Surrey	99.6	98.1	101.8	85.6	96.5	88.3	73.0	95.7	76.6
Kent	99.7	98.8	100.9	88.6	97.3	91.1	76.5	97.3	78.6
Sussex	97.9	99.2	98.2	82.8	96.9	85.7	71.2	96.1	74.1
Hampshire	100.4	99.2	101.9	89.0	98.1	90.6	77.7	97.3	80.2
Berkshire	98.3	99.6	99.1	87.5	97.6	89.7	74.2	96.4	76.9

County	1911-13			1920-2			1930-2		
	A.	P.	F.R.	A.	P.	F.R.	A.	P.	F.R.
Surrey	59.6	92.6	64.0	53.7	90.7	59.5	37.9	93.8	40.5
Kent	61.2	93.4	65.2	55.7	93.1	59.8	40.1	94.2	42.0
Sussex	56.1	92.9	60.7	49.8	92.2	53.6	38.6	94.1	41.1
Hampshire	65.9	95.7	68.9	59.7	94.2	63.2	44.3	95.3	46.2
Berkshire	64.1	92.1	70.1	57.3	94.0	60.7	41.4	95.6	43.6

A. = Actual ratio; P. = Potential ratio; F.R. = Percentage fertility ratio.

not been uniform throughout this period. The potential birth-rate for 1930-2 showed a slight increase on the value for the two preceding periods for every county except Hampshire.

*Occupations*

Agriculture was the chief source of employment for males in 1871 in each of the five counties Surrey, Kent, Sussex, Hampshire and Berkshire which composed this division. The order of the counties when arranged in percentages of this category was the same for 1871 and 1921, although in 1921 the numbers employed in this occupation were exceeded in two counties by two other occupations, commerce and finance, and transport in Surrey and by public administration and defence, and transport in Hampshire. Dairy farming in Berkshire, small fruit farming, orchards and hops in Kent, market gardening in Hampshire and Surrey were the chief features of agriculture. A considerable area of most counties was under pasture—the chalk downs afford excellent grazing for sheep—and large areas of Sussex and Hampshire were covered by woods. The mineral resources of this division are very limited, although towards the end of the period under review coal mining in Kent had begun to be important as a local industry. The manufactures were varied, and although some tended to be localized, e.g. cement making in the Medway Valley, the proportion engaged in any particular occupation was usually under 10 per cent. in any district. The defence services employed a large number of the males, particularly in Hampshire.

*Districts within the counties*

For the four triennial periods when the counties were divided into registration districts, the districts have been grouped into three broad occupational groups: (1) defence services, the proportion of males employed under this heading in the various districts varied from a quarter to over a half; (2) agricultural districts, where more than 40 per cent. of the male population was engaged on the land; (3) the remaining districts which had no predominant occupation have been grouped together. The birth-rates for these areas are shown in Table XVIII. The highest birth-rate in each triennium for the division

Table XVIII. *South-eastern counties. Legitimate birth-rates per 1000 married women, aged 15-45*

Registration county	1860-2	1870-2	1880-2	1890-2
<b>Defence services:</b>				
Surrey	321	307	310	274
Kent	271	274	281	249
Sussex	—	—	—	—
Hampshire	260	268	269	240
Berkshire	—	—	—	—
South-eastern counties	270	275	278	247
<b>Agricultural districts:</b>				
Surrey	280	288	280	263
Kent	290	304	296	262
Sussex	285	301	297	256
Hampshire	279	292	293	262
Berkshire	287	300	302	270
South-eastern counties	285	299	296	261
<b>Other districts:</b>				
Surrey	272	282	282	240
Kent	283	291	288	257
Sussex	264	274	269	226
Hampshire	260	267	269	238
Berkshire	277	290	282	251
South-eastern counties	272	281	279	242

as a whole was that of the agricultural districts. The districts with the defence services as the predominant occupation had the lowest rate in the first three periods but higher than the remainder of the division in the last.

The percentage decline during the 30 years varied very slightly between the occupational divisions, the decline ranging from 8 to 10 per cent. The fall in the birth-rate varied least amongst the agricultural districts; the percentage decrease, of the 1890-2 rate on the 1860-2 rate, was from 6 to 10, whilst the range of the percentage fall between the districts of the other two occupational areas was from 8 to 15 per cent.

The decline in the birth-rate in the garrison districts commenced later than in the other districts. Each of the garrison areas had the maximum rate in 1880-2, but the majority of the other districts showed a fall in the rate for this triennium.

The birth-rates for the three administrative periods in occupational districts are given for county boroughs and urban districts in Table XIX and for rural districts in Table XX. The percentages employed in public administration and defence ranged from 16 to 56 in the urban districts that have been combined under this heading and from 18 to 26 in the rural districts. The agricultural districts are, in the urban areas, those where at least 20 per cent. of the males were engaged on the land and in the rural districts where more than half the males were so occupied in 1921. The metal-working districts in the urban areas had at least 20 per cent. of the males employed in this industry in 1921.

Table XIX. *South-eastern counties. County boroughs and urban districts. Legitimate birth-rates per 1000 married women, aged 15-45*

Administrative county	1911-13	1920-2	1930-2
Public administration and defence:			
Surrey	185	163	130
Kent	177	164	122
Sussex	—	—	—
Hampshire	185	171	125
Berkshire	—	—	—
South-eastern counties	183	169	124
Agricultural districts:			
Surrey	—	—	—
Kent	178	183	125
Sussex	161	157	96
Hampshire	—	—	—
Berkshire	—	—	—
South-eastern counties	173	164	117
Metal-working districts:			
Surrey	—	—	—
Kent	193	175	116
Sussex	—	—	—
Hampshire	167	151	120
Berkshire	—	—	—
South-eastern counties	178	163	118
Other districts:			
Surrey	168	152	106
Kent	172	152	113
Sussex	155	135	107
Hampshire	173	148	118
Berkshire	187	166	120
South-eastern counties	168	149	111

The highest birth-rate in the urban districts of the whole division, for each of the three triennia, was that of the garrison districts. In the rural areas the birth-rate in the garrison districts and in the agricultural areas was approximately equal, except in 1920-2, when the rural agricultural areas had a higher rate than any other occupational district, owing to the fact that the birth-rate in these districts did not show a decline in the rate for the previous triennium.

The percentage decline in the birth-rate between 1911-13 and 1930-2 was similar for each occupational division and for urban and rural areas; the



Table XX. *South-eastern counties. Rural districts. Legitimate birth-rates per 1000 married women, aged 15-45*

Administrative county	1911-13	1920-2	1930-2
Public administration and defence:			
Surrey	174	159	111
Kent	178	145	113
Sussex	170	159	105
Hampshire	196	184	134
Berkshire	—	—	—
South-eastern counties	185	167	122
Agricultural districts:			
Surrey	—	—	—
Kent	183	178	123
Sussex	165	169	128
Hampshire	177	180	128
Berkshire	206	209	130
South-eastern counties	181	180	125
Other districts:			
Surrey	172	152	112
Kent	187	179	117
Sussex	172	157	117
Hampshire	179	173	123
Berkshire	172	168	124
South-eastern counties	176	166	119

fall was from 31 to 34 per cent. The decline in the birth-rate for the 20 years between the districts in the same occupational division showed no appreciable differences. The range of the decline was slightly larger in the rural areas than in the urban areas, i.e. the fall in the birth-rate of the garrison districts was 30-32 per cent. in the urban areas and 32-38 per cent. in the rural, and in the "other" districts 31-37 per cent. for the urban districts and 28-37 per cent. for the rural. The largest decline was in the urban agricultural and urban metal-working districts, where the rate fell 40 per cent.

### *Populations*

The population of each county in this division has rapidly increased during the period under review. The increase has been much greater than in the counties previously studied. The population at the end of the periods studied expressed as a percentage of the population at the beginning is:

County	Population of 1891 as a percentage of 1861	Population of 1931 as a percentage of 1911
Surrey	221	140
Kent	148	117
Sussex	151	116
Hampshire	143	116
Berkshire	135	115
England and Wales	145	111

The increase in the population of Surrey was greater in each period than that of any other county in the south of England. The next largest in the first period was that of Glamorganshire, but the rate of increase fell below the England and Wales rate in the second period.

*General remarks on the south-western and south-eastern divisions*

The decline in the birth-rate of these divisions as a whole did not start until the decade 1880-2 to 1890-2. This is later than in Wales, where the fall commenced in the previous 10 years. In some of the counties the rate had fallen before this date, particularly in Cornwall, where the rate has declined throughout the 80 years. In consequence of this decline in the birth-rate, the rate for 1930-2 is only 40 per cent. of the rate in 1870-2. The potential birth-rate had declined only 5 per cent. during these 60 years, so that the changing age constitution of the married women is not a factor of importance.

The birth-rate in the rural districts of the whole divisions was higher than in the urban districts and county boroughs. In the individual counties, however, there was some variation in the birth-rates, and on some occasions the rate of rural areas was the lowest.

The decline in the fertility during the last 20 years had been fairly uniform in the different counties, and the wide variation exhibited in Wales was absent. The actual birth-rate in 1930-2 had fallen from 28 to 40 per cent. of the 1920-2 value in the urban districts and from 30 to 36 per cent. in the rural districts of the separate counties.

For the districts grouped according to occupations, the lowest birth-rate was, for the divisions as a whole, that of the garrison districts for the period 1860-90. The garrison districts of Surrey were exceptional, the rate being one of the highest in the two divisions. The agricultural districts had a birth-rate in excess of the non-agricultural areas. The trend of the birth-rate in the coal-mining districts of Somersetshire was different from that experienced by other districts, and in 1890-2 the rate was considerably larger than in any other districts in these divisions, but the rate declined rapidly and by 1930-2 this advantage was lost. The potential rate in these areas was high. The agricultural districts in the rural areas, for the three periods when this division was possible, had a higher rate in each triennium than the "other districts". The most noteworthy change in the birth-rate during the last 20 years is that exhibited by the garrison districts. In the previous period the rates in these districts had been on the whole the lowest in the division, but in the last decade the birth-rate was the highest and the potential birth-rate was also high in both periods. This change in the relative position of the birth-rate of the garrison districts is interesting, since early marriage is not encouraged in the services, and married allowances are not made until the age of 26. Previously the number of married men in a unit was fixed, and although no age limit was imposed it was necessary to wait for a vacancy to get "on the strength". Life in the services is sheltered from the vagaries of trade booms and depressions, and this may account, in part, for this change in the relative position of the birth-rate.

## V. THE SOUTH

The birth-rates for the four divisions in the south of England and for England and Wales, northern England (the counties of Lancashire, Cheshire, Yorkshire, Westmorland, Cumberland, Durham and Northumberland, the district studied by Dr Elderton in her report on the birth-rate north of the Humber) and London are given in Table XXI. The highest birth-rate in the

Table XXI. *All areas. Legitimate birth-rates per 1000 married women, aged 15-45*

Area	1850-2	1860-2	1870-2	1880-2	1890-2	1900-2	1911-13	1920-2	1930-2
England and Wales	284	282	292	286	264	236	196	179	123
Northern England	297	289	300	286	266	240	199	183	127
London	251	257	270	273	250	228	198	183	119
South Wales	299	306	316	306	301	271	234	201	128
North Wales	283	289	302	283	262	246	201	175	134
South-western counties	290	290	289	290	261	216	177	164	116
South-eastern counties	280	275	284	282	247	213	174	157	115

south was that of South Wales for each of the nine triennia, except the last when the rate for North Wales was larger. The birth-rate in the south-western counties was below that of Wales for the last five periods and the rate for the south-eastern counties was the lowest in each of the nine periods. The birth-rate in South Wales was larger than that for the whole country in each period, and the rate for the south-eastern counties was in defect in each triennium. The birth-rate for North Wales was below that of England and Wales on four occasions and the rate for the south-western counties was less in six periods. The birth-rate for northern England is below that for Wales as a whole throughout the 80 years but above the remaining divisions of southern England. The birth-rates for London form a contrast to those of the south. In the early triennia the rate was much below that of the south, but the decline was less and the London rate was higher than the rate of the south-eastern counties for the last five periods and higher than the rate of the south-western counties in the last four triennia. The birth-rate of London was below that of either South or North Wales in each of the nine periods, with the exception of the rate for North Wales in 1920-2.

The diminishing birth-rate has not yet resulted in a decrease in the population of the country. Since the mortality rate is also declining, it follows that the birth-rate may fall below the level necessary to reproduce the population without the actual population showing an immediate fall. The minimum birth-rate required to reproduce the population exactly is a source of interesting speculation, but an exact estimation cannot be made. The factors affecting the calculation are the sex ratio, the chance of living to a marriageable age, the chance of marrying and the duration of marriage before the end of the fertile period. The proportion of girls among the births is 0.488. The mean age of spinsters aged 15-45 who married in 1931 was 24.5 years. From the

English Life Table No. 9, the chance of a female living to age 25 is 0.84553, and the average number of years lived from 25 to 45 is 19.2, but this ignores the fact that the marriage may be terminated by the death of the husband or by divorce. An exact assessment of the latter factors is impossible, and a further complication arises with remarriages. If the moderate allowance of 1.2 years is made for these factors the mean number of years of married life before age 45 is 18.0 on the above assumptions. The chance of a woman marrying before the age of 45 has to be considered; if the proportion of single women to all women at age 45–46 in the 1931 census is taken as an indication, the chance is 0.825. Now if  $x$  is the birth-rate per 1000 married women aged 15–45 required to reproduce the married women exactly, then

$$x(0.488 \times 0.84553 \times 0.825 \times 18.0) = 1000,$$

therefore

$$x = 163.$$

So that approximately a birth-rate of 163 per 1000 married women aged 15–45 is required to maintain a stable population, or stated in another way the average size of a family should be 2.9 children.

On the above estimation the populations of the south-eastern counties were not reproducing themselves in 1920–2. In 1930–2 the rate for the division studied and the country as a whole was much below the necessary standard for a stable population, and on the assumption of a fertility period of 18.0 years the average size of a family was only 2.2 children in this triennium.

*(MS. received for publication 9. VI. 1936.—Ed.)*