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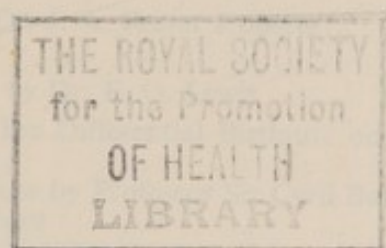
PAPERS OF THE
ROYAL COMMISSION ON POPULATION

VOLUME V

Memoranda

presented to the

Royal Commission

LONDON: HIS MAJESTY'S STATIONERY OFFICE
1950
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MEMORANDA

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FOREWORD BY THE CHAIRMAN OF THE ROYAL COMMISSION

This volume contains a number of papers presented to the Royal Commission on Population, to which extended reference was made in appropriate sections of the Commission's Report (Cmd. 7695, June, 1949). The first is a memorandum on the Economic Position of the Family by Mr. J. Hajnal and Professor A. M. Henderson. Next there is a series of papers on the Relations between Intelligence and Fertility by Professor Sir Godfrey Thomson, Professor R. A. Fisher, Professor J. B. S. Haldane, Dr. J. A. Fraser Roberts, Dr. E. O. Lewis and Professor Sir Cyril Burt. Finally there are two memoranda submitted by Mr. R. F. Harrod.

The Royal Commission received many other memoranda and also took evidence orally from a large number of witnesses. This evidence was of great help to the work of the Commission and arrangements have been made to ensure that records of the whole of it should be available to interested members of the public. A complete set of copies of the written memoranda and the transcripts of oral evidence has been deposited, and may be consulted, at each of the following five libraries: the British Museum (State Paper Room), the library of the General Register Office for England and Wales, the Library of the London School of Economics, the National Library of Scotland at Edinburgh, and the library of the University of Liverpool. A list of the bodies and individuals who gave evidence is contained in Appendix 2 to the Royal Commission Report.

HUBERT D. HENDERSON.

March, 1950.

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MEMORANDA SUBMITTED BY MR. R. F. HARROD

The Economic Position of the Family

MEMORANDUM BY

MR. J. HAJNAL and PROFESSOR A. M. HENDERSON

1. The economic position of the family has been considerably affected by the changes of conditions since 1938. Some of these changes may be temporary and our knowledge of their consequences is largely tentative. It is therefore convenient to divide these notes into two parts, the first dealing with the pre-war position, for which we have most information, while the second attempts to bring this information up to date.

PART I

THE PRE-WAR POSITION

A.—Unequal Distribution of Child Dependants

2. If people with different numbers of dependants are compared their incomes may be found to be very badly adjusted to their needs. The most important group of non-earning dependants are dependent children. In mid-1944 the population of Great Britain contained 9.9 million children under 15, and 14.2 million men aged 20-64, i.e. about 0.7 children per adult male. There were about 10 million married men between 20-64, so that there was about one child per married man. In fact, however, the children were very unevenly distributed, a large number of them falling on a small number of parents. The children were concentrated in about 5.5 million families (not all of which had an adult male earner). About 7 millions of the 10 million children were in 2.6 million families of 2 or more, i.e. an average of 2.7 dependent children per family, and 3.8 million children were in 1.1 million families containing 3 or more children. Roughly one-quarter of the families carried three-quarters of the children.

3. The problem of the economic position of the family is the problem created by this uneven distribution between earners of the burden of providing for children.

4. If we look at the married couples in the country at any one time the majority of them are found to have no dependent children, but most of these either have had dependent children in the past or will have them in the future.

5. This may be seen more clearly by considering the distribution of dependent children by the age of their parents. Table I shows the average number of dependent children per 100 women in various age groups in 1921[1] and 1944.

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[1] The 1921 figures are based on the dependency returns of the 1921 Census. The figures for 1944 are from data obtained in connection with applications for widows' pensions (under the Contributory Pensions Act). If the small section of the population whose high incomes exclude them from this scheme were included, the figures would be slightly lowered. In both sets of figures the upper age limit is about 14½.

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TABLE I

Average number of dependent children to women in various age groups

Age Group				Children per 100 women	
				England and Wales, 1921	England, 1944
21–25	...	...	...	29	35
26–30	...	...	...	88	91
31–35	...	...	...	143	114
36–40	...	...	...	157	115
41–45	...	...	...	126	76
46–50	...	...	...	71	41
51–55	...	...	...	16	8
56–60	...	...	...	6	3
61–65	...	...	...	$\frac{1}{2}$	—
66–70	...	...	...	$\frac{1}{2}$	—

6. It will be seen that the burden of dependency affects different age groups very unevenly in both 1921 and 1944 ; it rises to a maximum in the age group 36-40. The burden of dependency is very small at ages under 25 and over 45. The duty of bringing up children is usually concentrated on a part only of a person's adult life.

7. Secondly, it will be noticed that this concentration has increased between 1921 and 1944. A striking diminution in the number of dependent children between 1921 and 1944 (owing to the decline in the average size of family) occurred in the older age groups. The average number of dependent children per woman under 30 had not declined at all between 1921 and 1944[1]. At higher ages, however, the position has changed radically, and over the age of 50 the average number of dependent children is now almost half what it used to be. Owing to the fall in the size of families, the average person to-day has finished bringing up children earlier than in former days. If figures were available for years earlier than 1921, the fall of dependency in the older age groups, which must have gone far by 1921 in comparison with the 19th century position, would appear even more striking. The burden of maintaining dependent children has been concentrated more and more on a narrow range of the individual's life.

8. The fact that women aged over 45, and correspondingly men aged over, say, 50, have very few dependants to support is of great interest. Earnings often increase with age, and it is likely that many men will earn more between 50 and 65 than in earlier periods. Further, at this age, there is no prospect of achieving the required redistribution of income from the time when there are no dependants to the time when there are children to support, by means of saving on the part of the individual. The import-ance of this age group has been increasing recently.

9. In terms of the life of the individual, the fall in the death rates in the last century means that fewer men now die in middle life than was formerly the case. For example, of men aged 35, only 51 per cent. would live to be 65 according to the death rates of 1891-1900. According to 1938-9 mortality 68 per cent. of those aged 35 would live to be 65. It is clear therefore that a substantial proportion of men who may find it difficult to support a family, have before them a period when their earnings may well

[1] There was in fact a slight increase because more of the young women were married in 1944 than in 1921. The number of children per married woman had declined.

be high and their responsibilities low—a far greater number now than was formerly the case. The distribution of the individual's income over the various parts of his life, is, therefore, becoming increasingly unsatisfactory in relation to his needs.

10. The proportion of older men in the working population has already increased considerably (owing to a falling birth rate as well as to falling mortality), and this tendency is of course continuing. In 1944 men aged 50-65 represented 25 per cent. of all men of working age (20-65) in Great Britain, as against 19.6 per cent. in 1911. This means that the share of the nation's income which accrues to persons who are no longer responsible for the maintenance of children is increasing. It thus requires a diminishing levy (per head), on those who no longer have children to support, to provide the same benefit for the parents of several children.

11. The major portion of income taken away from those with no dependent children at any one time is taken from men who, at one time or another, have been or will be beneficiaries of such a redistribution. At any one time, as the figures of paragraph 2 show, 60 per cent. of men of working age have no dependent children and 80 per cent. have charge of fewer than two children. Yet there are only about 25 per cent. of men who never in the course of their lives have charge of a dependent child and only 45 per cent. who never have charge of more than one.

12. Thus, a redistribution of income in favour of parents by means of family allowances or other fiscal measures has two effects: (1) It redistributes income over the lives of individuals, so that more of their income accrues to them when they have children to look after and less at other times. (2) It takes income from those who in the course of their lives never have many children to support for the benefit of those who have several children.

B. Dependency in Relation to Income

13. The problem of the concentration of the burden of maintaining children on a small proportion of the adult population is aggravated by the fact that those with dependent children to support have lower incomes, on the whole, than those without them. This fact is widely known. It is largely the consequence of the fact that those in the worst paid occupations are more fertile than the average. There are, however, other factors, e.g., the tendency for income to increase with age, which have the same effect. The data on the distribution of the number of dependent children by the income of the parent are very inadequate. The only figures on a national scale come from the income tax returns, an analysis of which, by the number of dependent children, is available for 1937-8. These figures relate only to persons with incomes over £200 per annum, and they therefore do not cover the greater part of the parents of the country. However, within the range covered by the figures, the average number of dependent children per married couple decreases uniformly with increasing income. This may be seen in Table II.

14. It is also possible to show that the family size of those included in the tax returns is smaller than that of those too poor to pay income tax. The income tax figures for 1937-8 cover 3.1 million married couples earning £200 or more. This represents about 31 per cent. of the total married couples in the United Kingdom. Persons earning over £200 per annum were responsible together for 2.9 million children. These children represented only 26 per cent. of all the children under 16 in the United Kingdom in 1937. Thus income-tax payers have rather a smaller number of dependent children than the population as a whole.

TABLE II

Dependent Children of Married Couples Assessed to Income Tax in the United Kingdom, 1937–8

Range of Income (£ per year)	Dependent children per 100 couples
200–219	95
220–249	94
250–299	92
300–399	88
400–599	86
600–799	84
800–999	83
1,000–1,999	83
2,000–2,999	84
3,000–4,999	76
5,000–9,999	68
10,000 and over	54
All incomes	90

15. We may pass from national figures to selected groups. An interesting picture of the relation of dependency to income among members of a small group of occupations can be obtained from a collection of budgets made in 1938-39(¹). These budgets relate to the households of civil servants, local government officers, and teachers, i.e., middle class households. Table III shows the average number of children of various ages dependent on each household (classified by the income group of the head of the household).

TABLE III

Average Number of Children in Middle Class Budgets 1938–9

	Income of Head of Household			
	£250–£350	£350–£500	£500–£700	£700 and over
Children under 5 ...	0·33	0·23	0·13	0·14
Children 5–13	0·43	0·61	0·57	0·59
Children 14–18	0·12	0·28	0·39	0·35
TOTAL CHILDREN ...	0·88	1·12	1·09	1·08

16. It would appear from the table that the average number of dependent children is higher in the £350-£500 group than in the lowest income group. But as the eye passes to groups over £500 per annum the number of children falls again. The explanation of this irregularity is that the men with the larger incomes are, on the whole, older than the men with smaller incomes. In the occupations to which the table related, incomes rise appreciably with age. The effects of this are clearly visible in the distribution of the number of children by age.

17. The number of children under 5 per family decreases with increasing income. Conversely, the number of children between 14 and 18 is larger for the larger income groups. It is clear in fact that the families included in the income group " £250-£350 per annum " were families at a relatively early stage of growth. The average number of children under 5 is almost three times as great as the average number of children aged 14-18. On the other

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(¹) For the source of these budget figures, see para. 32 below.

hand, the families with incomes over £500 per annum were clearly on the whole families at later stages of growth. On average, the number of children aged 14-18 was three times the number of children under 5[1].

18. It may be shown that the number of dependent children in the middle class occupations covered in Table III was lower than that found in collections of budgets from working class households. The official budget inquiry conducted by the Ministry of Labour in 1937-8, showed an average of 0.99 children under 14 in the households of industrial workers and 1.14 among agricultural workers. These figures should be compared with 0.78 for the middle class budgets. The number of children aged 14-17 per household was 0.31 for industrial workers, 0.26 for agricultural workers and 0.23 for the middle class occupations. This is a further illustration that those who can less easily afford it (those included in the Ministry of Labour Budgets had incomes under £250 per annum) had a larger number of children to support than those with higher incomes.

19. Mention should be made of a further source of information on the extent to which the burden of maintaining the larger families is borne disproportionately by members of lower income groups. Light may be thrown on this question by utilising the statement of the occupation of the father at birth registration.

20. Table IV gives the proportion of all legitimate children and the proportion of first and of fifth, sixth and higher-order children born to fathers of different occupations in 1939. The proportion which any one occupation contributes to the total of births of different order should be compared. For example, 4 per cent. of all legitimate births were born to fathers in the " Professional and Administrative " group. This group contributed 5 per cent. of first births, but only 1 per cent. of fifth births and ½ per cent. of births of higher order.

TABLE IV

Distribution of Legitimate Maternities of Different Order by Occupation Group of Father, England and Wales, 1939

Group	Percentage assigned to stated occupations among:			
	All births	First births	Fifth births	Sixth and higher order births
Professional and Administrative ...	3·9	4·9	1·0	0·5
Employers	6·9	7·9	3·5	2·6
Clerks, Typists	3·6	4·9	1·1	0·9
Shop Assistants and Personal Service	7·1	8·5	4·2	3·2
Foremen	2·3	2·1	2·5	2·3
Skilled Manual Workers	32·1	34·2	28·1	24·4
Semi-skilled Manual Workers ...	7·8	7·6	8·7	8·9
Unskilled Labourers	18·8	14·1	29·7	36·3
Textile Workers	1·2	1·3	1·0	0·7
Miners	6·8	5·0	10·5	11·5
Farmers	1·7	1·5	2·0	1·5
Agricultural Labourers	2·8	2·2	4·1	4·5
Other Ranks in Police and Services	5·0	5·7	3·6	2·7
	100·0	100·0	100·0	100·0

[1] It is of interest to note that the families where the head of the household earned more, were also better off in that they had a larger number of subsidiary earners. The average number of subsidiary earners in successive income groups (beginning with £250-£350) was: 0.17, 0.25, 0.26, 0.30.

21. It will be seen that among the occupation groups with high social status and high income, the proportion of children born into large families is very small. By contrast, the proportion of children born in large families to unskilled labourers, miners and agricultural labourers, is far higher than their share in the total births. For example, the "Professional and Administrative" group and "Employers" together contributed 13 per cent. of first births and $4\frac{1}{2}$ per cent. of fifth births. By contrast, "Unskilled Labourers", who contributed 14 per cent. of first births, provided no less than 30 per cent. of fifth births. This situation is the result mainly of the fact that parents in the high income groups tend not to have large families[1].

C. Children and Poverty

22. The effects of the maladjustment between income and dependency may be illustrated from various data collected at social surveys. The information used here from these social surveys is obtained in the following manner. For each household covered in a survey, the total income and the family composition are obtained. The needs of the family for adequate nutrition, clothing, fuel and so forth, are assessed on the basis of a scale of minimum needs adequate to maintain physical health for persons of the various age and sex groups included in the household. The income needed by the family to provide for these minimum needs is then compared with the income actually available to meet them[2]. Families where the available income falls short of the required income are regarded as being in poverty.

23. Surveys of this kind have been made in a number of towns in Britain in the last 30 years. These surveys relate to towns of varying prosperity, to periods of economic depression and of economic recovery, and finally, the definition of minimum needs, on which the classification of poverty is based, is not the same in all surveys. Nevertheless, it is found that all surveys show certain outstanding facts about the economic situation of families with children.

24. A general picture may be obtained by comparing the proportion of *children* found to be living in families who are in "poverty" (i.e., families with insufficient income for their needs), with the proportion of *all families* in "poverty". Such a comparison is shown in the figures from various surveys in the last 20 years in Table V.

25. It will be seen that in each of the surveys covered, the proportion of children in poverty is far greater than that of all families in poverty[3]. This is a result, in part, of the concentration of children in families where the income of the principal wage earner is low. The main reason for this effect is, however, the fact that children have increased the needs of a family without adding to its income.

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[1] The most important influence on the figures apart from occupational differences in fertility is the fact that the numbers of men in occupations of high social status have on the whole been growing more rapidly than the numbers in occupations of low status. The former occupations, e.g., "Clerks", therefore, contained in 1939 an abnormal proportion of young men, i.e., an abnormal proportion of men in a position to have first children.

[2] The income left after deduction of rent, compulsory insurance and expenses of travelling to and from the place of work.

[3] Comparisons *between* different surveys should not be made, because different definitions of the "poverty line" have been adopted in different surveys.

TABLE V

The Incidence of Poverty on Children

Survey	Percentage of poverty among—	
	Families	Children
London (1929) ([1])	9·8	13·0
Merseyside (1929–31) ([2])	17·3	24·5
Southampton (1931) ([3])	20·0	30·0
Sheffield (1933) ([4])	17·1	26·9
Miles Platting (1933) ([5])	9·0	28·0
York (1936) ([6])	31·1	52·5
Bristol (1937) ([7])	10·7	21·4
Birmingham (1939) ([8]) (Housing Estate)	14	31

([1]) *New Survey of London Life and Labour*, Sir H. Llewellyn Smith and others, Vol. VI (1934).
([2]) *Social Survey of Merseyside*, ed. D. Caradog Jones (1934).
([3]) *Work and Wealth in a Modern Port*, P. Ford (1934).
([4]) *Survey Pamphlets*, ed. A. D. K. Owen (1931-33).
([5]) *City of Manchester Plan*, R. Nicholas (1945).
([6]) *Poverty and Progress*, B. Seebohm Rowntree (1941).
([7]) *The Standard of Living in Bristol*, H. Tout (1938).
([8]) *Nutrition and Size of Family*, M. S. Soutar, E. H. Wilkins and P. Sargant Florence (1939).

26. Some of the surveys for which figures are given above may now be used to obtain a fuller picture of the relation between poverty and family size. Table VI shows the proportions of families of various size who are in poverty. It will be seen that in spite of the differences referred to above between the surveys a consistent picture again emerges. The proportion of families in poverty increases rapidly as the number of dependent children in the family increases.

TABLE VI

Percentage of Families in Poverty According to Number of Children

Survey	Number of Children					
	1	2	3	4	5	6 or more
London (1929) ...	5·4	8·4	11·6	17·6	25·0	37·0
York (1936) ...	28·8	36·6	46·7	59·3	69·5(a)	
Bristol (1937) ...	6·5	11·1	24·9	51·3(b)		
Birmingham (1939)	3·0	11·0	27·0	55·0	60·0	82·0

(a) 5 or more children.   (b) 4 or more children.

27. It is important to enquire how the picture of Table V is affected if the definition of the " poverty line " is varied. Table VII compares the proportion of children in poverty on two different standards in the York, Bristol, and Birmingham surveys. It will be seen that if the standard of " minimum needs " is reduced the contrast between the position of the large and the small families is increased. If the " poverty line " is progressively lowered, it is possible to reduce the proportion in poverty among families with few children almost to zero, while still leaving a very considerable percentage of the larger families below the line. The concentration of children is relatively heaviest among those families whose income falls most short of being adequate to their needs. Having a large family was in the 1930's, in the working class at any rate, almost enough to guarantee poverty.

TABLE VII

Proportion of Persons in Poverty among Families with Various Numbers of Children
According to Different Definitions of the " Poverty Line "

Survey	Definition of Minimum needs	Number of Children in Family					
		1	2	3	4	5	6 or more
York, 1936 ... {	Higher ...	28·8	36·6	46·7	59·3	69·5(a)	
	Lower ...	2·6	5·7	14·6	24·2	43·0(a)	
Bristol, 1937 ... {	Higher ...	12·0	15·0	26·5	52·5(b)		
	Lower ...	6·5	11·1	24·8	51·3(b)		
Birmingham, 1939 {	Higher ...	13·0	45·0	65·0	85·0	96·0	96·0
	Lower ...	3·0	11·0	27·0	55·0	60·0	82·0

(a) 5 or more children. (b) 4 or more children.

28. Though the proportion of families of many children is small, the fact
that so many of the large families are below the poverty line means that
a large proportion of the children in poverty tend to be members of large
families. This is shown in Table VIII. Here again, the results of using
two different definitions of the "poverty line" may be compared and
two sets of figures have therefore been given for the York survey. It will
be seen that if the lower definition of the poverty line is adopted (shown
in the column headed (b)) the proportion of all children in poverty who
are members of large families is very much greater than on the more
generous definition. This was, of course, to be expected.

TABLE VIII

Distribution of all Children in Poverty among Families of Different Sizes

Number of children in Family	Of all children in poverty, the percentage in families of stated size			
	London, 1929	York, 1936		Bristol, 1937
		(a)	(b)	
1	9	18	5	8
2	18	27	14	16
3	21	20	20	23
4	19	16	21	23
5 or more	33	19	39	30
	100	100	100	100

(a) Figures relate to a "poverty line" by which minimum income for a man,
wife and three children is 53/– per week.
(b) Figures relate to "primary poverty", i.e. the minimum income for a man,
wife and three children is taken as 35/– per week (the minimum incomes for
families with more or with fewer children being on a similar scale).

29. The importance of the concentration of poverty on children is not
measured by the proportion of persons in poverty at any one time. Everyone
has to pass through childhood. If the proportion of poverty is high among
children it means that the proportion of all persons who at some time in

their lives are in poverty, will be high. It is of interest, therefore, to show the proportion of people in different age groups who are in poverty. This is done in Table IX. It will be seen that poverty is concentrated on children, on those with dependent children to support, and on the old. Among persons in the age range between 20 and 70, the proportion of persons in poverty is closely correlated with the number of dependent children, as may be seen by reference to the distribution of the number of dependent children by age given in Table I. Table IX shows the burden of poverty is least in two age groups: the young earner who has not yet incurred heavy family responsibilities and in the older age group which has not yet reached the age of retirement but has already shed many of the responsibilities for the maintenance of a family.

30. This comparison illustrates again an important effect of a redistribution of income in favour of families with several children. The proportion of the population who would benefit at some time in the course of their lives, would be far greater than the proportion who would benefit at any one moment of time.

TABLE IX
Proportions of Persons of each Age Group in Poverty

York, 1936		Bristol, 1937	
Age Group	Per cent. in poverty	Age Group	Per cent. in poverty
Under 1	52·5		
1–4	49·7	0–4	19·4
5–14	39·1	5–9	22·8
		10–14	20·6
15–24	23·7	15–19	9·6
		20–24	4·1
25–44	28·8	25–29	4·9
		30–34	8·0
		35–39	12·8
		40–44	10·7
45–64	20·7	45–49	9·2
		50–54	7·2
		55–59	8·5
		60–64	9·3
65 and over	47·5	65–69	9·2
		over 70	12·6

D. The Impact of Children on Family Expenditure

31. The effect which the addition of children has on the standard of living of a family may be examined by means of data collected in family budget inquiries. Such inquiries show the amount spent by the housewife in different forms of expenditure per week. It is possible, by analysing the data separately for families with different numbers of children, to answer such questions as this: If a child is added to the family while no increase in income occurs, on what goods will more money be spent than before, and on which goods less money?

32. Data from two separate budget inquiries will mainly be used in the following notes[1]. They are (1) the budgets of working class families collected in an official inquiry by the Ministry of Labour in 1937-8, (2) budgets relating to certain middle class occupations (civil servants, local government officials and teachers) collected by the Civil Service Statistical and Research Bureau in 1938-39 ; this enquiry was directed by Mr. Philip Massey, whose report *The Expenditure of 1,360 British Middle-Class House-holds in* 1938-9 appears in the Journal of the Royal Statistical Society, Vol. CV, Part III, 1942. Special studies of variations of expenditure in this material have been made for the Royal Commission. All the working class budgets utilised relate to industrial, commercial and clerical workers living in areas outside London[2].

33. As a first step we may compare the division of expenditure between the main items in families with a different total expenditure and different numbers of children. This is done in Table X which shows the proportionate distribution of expenditure in families at different levels of total expenditure. The table gives figures separately for families without children and for families with two children[3].

34. The pattern of expenditure in families with a different total expenditures[4] but the same number of children may be compared by reading Table X across from left to right. Table X shows that the effect of an increase in income is the same on families with and families without children ; (1) Rent behaves somewhat irregularly, but on the whole forms a decreasing proportion of total expenditure as income increases. (2) The proportion of income devoted to standard foods declines steeply as the available income increases. The proportion of expenditure on fuel and light also shows a decrease with increasing income. (3) The proportion devoted to luxury foods is roughly constant. (4) The proportion of income devoted to clothing increases as income increases. The same is true of households and sundries, luxuries and insurance. These relations are well known, and much as one would expect. As more income becomes available a smaller proportion

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[1] Figures from the same budget collections have been used in another connection in Table III and paragraphs 15-18 above.

[2] The expenditure of agricultural families and families living in London is exceptional in various ways, especially with regard to rent, which make it inconvenient to combine these budgets with those for the rest of the population. The number of budgets considered below is only 7 per cent. of those collected by the Ministry of Labour. This is chiefly due to two further exclusions: first, only those families (23.5 per cent. of the total) which provided details of their clothing expenditure over a full year have been considered, secondly all families have been excluded which contained more than two adults (i.e., persons over 14) or where there was a change in family size during the year when budgets were compiled. The method of collection is explained in the *Ministry of Labour Gazette*, December, 1940.

[3] It is perhaps necessary to explain the distinction between standard foods and "luxury" foods. The standard foods are those foodstuffs on which expenditure rises less than proportionately to total expenditure as total expenditure increases, i.e., broadly speaking they are necessities which bulk the more largely in a person's expenditure the poorer he is. "Luxury" foods are those foods, expenditure on which increases more than proportionately to total expenditure, i.e., they are foods, the greatly increased consumption of which is characteristic of persons with higher incomes. This does not mean they are in any general sense luxuries, particularly from the point of view of the adequate nutrition of children ; for example, they include fresh fruit and green vegetables.

[4] For reasons of convenience families with a higher total expenditure will be referred to in the subsequent discussion as having a higher "income" (as indeed they generally have in fact).

of it has to be spent on the necessaries of life and a larger proportion can be spent on luxuries or on meeting the necessary needs in a more luxurious way.

TABLE X
Distribution of Expenditure at Various Income Levels
Expenditure on each group of items per cent. of total expenditure
(a) Childless couples

Items	Working Class Budgets (Shillings per week)			Middle Class Budgets (£'s per annum)	
	40/– to 60/–	60/– to 90/–	90/– and over	£250 to £400	£400 to £550
Rent	16	16	13	15	14
Standard Foods	34	28	21	16	13
Luxury Foods	7	9	8	8	7
Clothing	8	8	8	10	14
Fuel and Light	10	8	6	5	5
Household and Sundries	6	9	17	15	13
Luxuries and Insurance	19	22	27	31	34
All items	100	100	100	100	100

(b) Couples with 2 dependent children

Items					
Rent	15	13	10	14	12
Standard Foods	38	34	26	19	16
Luxury Foods	7	8	6¼	8	8
Clothing	8	9	9	12	12
Fuel and Light	9	8	6½	6	5
Household and Sundries	6	8	19	15	15
Luxuries and Insurance	17	20	23	26	32
All items	100	100	100	100	100

35. Table X shows also that, broadly speaking, the effect of the accession of a child to a family is to make the family poorer, i.e., the accession of the child has the same effect as if a certain amount of income were taken away. The predominant effect in either case is to increase the proportion spent on standard foods and reduce that spent on luxuries. The effect of accession of children is not, however, exactly comparable to a loss of income. We may rearrange some of the figures from Table X to illustrate this. This is done in Table XI.

36. In Table XI the working class childless families spending over 90s. per week are taken as the basis of comparison. Their distribution of expenditure (shown in the first column of the table) is compared (a) with that of families with same total expenditure but two children (column 2) (b) with that of families spending only between 60s. and 90s. (column 4).

37. Column 3 of Table XI shows the direction in which the proportion of expenditure devoted to a given item is altered in the family with two children as compared with the childless couples. Commodities on which the two-child family spend a higher proportion of their income (e.g., standard foods) are marked with the sign " + ", those on which they spend a lower

proportion of their income (e.g., luxuries) with " – ", those on which they spend the same proportion (e.g., clothing) with " 0 ". The direction of change between the expenditure of childless couples spending over 90s. and childless couples spending 60s. to 90s. per week is similarly shown in column 5.

38. By comparing column 5 with column 3 in Table XI we may compare the effect of the addition of children to the family with the effect of a reduction in income([1]). It will be seen that, as has been said above, the accession of children, like the loss of income, means that a far greater proportion of income has to be devoted to standard foods and a lower proportion can be devoted to luxuries. There are some differences between the effects of the accession of a child and loss of income. It will be seen that a lower income means that a higher proportion of expenditure is devoted to rent, while when children are added the proportion going in rent is decreased. On the other hand a loss of income causes a lower proportion to be spent on clothing and on household and sundries while the proportion of income spent on these items remains roughly constant if children are added to the family. The proportion of income spent on fuel and light is increased if less money is available, but remains roughly constant if the number of children grows([2]).

TABLE XI

Distribution (per cent.) of Total Expenditure and Direction of Change as (A) Children are added, (B) Income is reduced

Items	(1) Childless couples: Total expenditure 90/– or more	(2) Couples with 2 children: Expenditure 90/– or more	(3) Direction of change from childless to 2 child family	(4) Childless couples: Expenditure 60/– to 90/–	(5) Direction of change as income of childless couple is reduced
Rent...	13	10	—	16	+
Standard Foods ...	21	26	+	28	+
Luxury Foods ...	8	6½	—	9	+
Clothing	8	9	+	8	0
Fuel and light ...	6	6½	+	8	+
Household and sundries	17	19	+	9	—
Luxuries and Savings	27	23	—	22	—
	100	100		100	

39. What is the reason for the changes in the distribution of expenditure which occur when children are added to the family (while the total expenditure remains constant)? Why does expenditure increase on some items, but decrease on others? The addition of children means that more needs have

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([1]) Throughout the subsequent discussion it is assumed that to compare the expenditure of a childless family with that of families in the same income group but having two children, shows the alterations in the distribution of expenditure which parents in that income group make when children are added to the family. It is also assumed that comparison of the expenditures of families with the same number of persons at various income levels shows what happens to family expenditure as more (or less) income becomes available.

([2]) The small differences shown in Table XI for " luxury foods " and " household and sundries " are not significant as may be seen by making similar comparisons as in Table XI for some other income groups in Table X. Such comparisons also show that the differences in Table XI in the case of " clothing " and " fuel and light " do represent general tendencies which hold for other income ranges.

to be met in almost every direction. The parents have to spend less on themselves and more on the children. On some of the most urgent necessities, e.g., standard foods, the parents cannot save enough on their own expenditure to meet their children's requirements. To help buy the children's food they must curtail their expenditure on other things on which they can more easily spend less or perhaps do without entirely (e.g., theatre tickets). Whether the family's expenditure on a particular item increases or decreases as children are added depends on whether the particular items are such that, in spite of the increased needs of the children, it is possible to save on them to meet other more urgent needs.

40. Thus, even in cases where the total expenditure on an item is increased, the parents save on expenditure for themselves. The only item where this can be shown in detail is clothing. In the case of clothing, it is possible to allocate most of the expenditure between the clothing habits of adults and the clothing of children. Table XII shows what happens to a family's expenditure on clothing as the number of children grows. There are certain classes of expenditure, e.g., money spent on repairs, which cannot be easily allocated between parents and children. Such cases have been classed as " mixed clothing ".

41. Table XII shows that at each income level the total expenditure on clothing for the whole family remains roughly constant as children are added (there seems to be a slight increase in clothing expenditure when the third child is added to the family). But though the total does not change much, its composition is radically altered. The expenditure by the parents on their own clothing diminishes as the size of family increases, while expenditure on clothing for the children increases.

TABLE XII

Expenditure on Adult and Children's Clothing (Pence per Week) in Families of Different Sizes and Different Total Expenditure Groups

	Items	Total Expenditure (Shillings per week)		
		40/– to 60/–	60/– to 90/–	90/– and over
Childless Couples	Adult clothing ...	34	53	87
	Mixed clothing ...	13	14	25
	Children's clothing	½	1	1
	Total	47½	68	113
Couples with one child.	Adult clothing ...	22	42	61
	Mixed clothing ...	15	22	29
	Children's clothing	10	15	23
	Total	47	79	113
Couples with two children.	Adult clothing ...	19	35	58
	Mixed clothing ...	16	25	32
	Children's clothing	11	20	31
	Total	46	80	121
Couples with three children.	Adult clothing ...	19	32	—
	Mixed clothing ...	21	29	—
	Children's clothing	15	26	—
	Total	55	87	—

42. To show the effect of these changes more precisely we may present the figures in Table XII in a slightly different way. To show the meaning of the changes in expenditure as the composition of the family changes, we may divide each of the items in Table XII by the number of persons on whose behalf the expenditure is incurred. Thus, the figures for adult clothing may be divided by two, those for children's clothing by the number of children and those for " mixed clothing " by the total number of persons in the family. The results are shown in Table XIII. To facilitate comparison between families of different composition, the rows of Table XII have also been rearranged. Table XIII shows the figures for adult clothing for different sizes of family directly underneath one another, then the figures for " mixed clothing " then " children's clothing ".

TABLE XIII
Expenditure on Clothing per Head (Pence per Week)

Items	Number of Children	Expenditure 40/– to 60/–	Expenditure 60/– to 90/–	Expenditure 90/– and over
Adult Clothing	0	17	26½	43¼
	1	11	21	30¼
	2	9½	17½	29
	3	9½	16	—
Mixed Clothing ...	0	6½	7	12¼
	1	5	7½	9¼
	2	4	6	8
	3	4	6	—
Children's Clothing ...	1	10	15	23
	2	5½	10	15
	3	5	8½	—

43. Table XIII shows that as the size of their family grows parents spend less and less on their own clothing. Parents of two children spend about 30 per cent. less on their own clothing than childless couples in the same income group.

44. At the same time expenditure per head on the clothing of children in larger families is considerably lower than the amount spent on clothing children in smaller families. Where there are two children in the family, about 35 per cent. less per head is spent on their clothing than in the case of an only child in the same income group (it must, however, be remembered that two children cost less than twice as much to clothe, even on the same standard, than one child, because clothing can be passed from an older to a younger child).

45. The reduction of the parents' expenditure on their own needs when children are added to the family has now been shown in two ways: by shifts of expenditure from some items (e.g., luxuries) to others (e.g., food), and by the reduction of that portion of expenditure on any class of items which is devoted to the parents' needs. The adaptation of the family's expenditure to the increased requirements, however, takes yet another form. The same needs are met by buying cheaper goods than are purchased by the childless couples. An outstanding example is food. This may be seen from Tables X and XI above where expenditure on " standard foods " was separated from expenditure on " luxury foods ". As children are added to the family expenditure on " standard foods " increases, while that on " luxury foods "

remains constant. In other words, a family with children is able to devote a smaller proportion of its expenditure on food to the purchase of " luxury foods ", i.e., on the whole, it buys cheaper food than a childless family.

46. Housing is another example of the larger family's meeting its greater need by buying more cheaply. As has been seen above, expenditure on rent is in general reduced, as the size of the family grows. Examination of the number of rooms occupied by families with different numbers of children shows that the larger families manage by spending less money per room, i.e., by buying cheaper accommodation, and having the same number of rooms as childless families.

47. If we investigate more closely what items of expenditure are reduced to pay for the increased cost of children, we find that some items of expenditure which may be considered as luxuries nevertheless do not appear to be readily reduced as the size of the family increases ; tobacco is an outstanding example. Table XIV shows the weekly expenditure on tobacco for families with different numbers of children.

TABLE XIV
Expenditure (Pence per Week) on Tobacco and Cigarettes

	Total Expenditure 50/- to 60/-	Total Expenditure 60/- to 70/-	Total Expenditure 70/- to 80/-	Total Expenditure 80/- to 90/-
No children	26	28	32	34
One child	25	30	29	36
Two children	21	29	31	36

48. It may be seen that on average the parents of children spend no less on tobacco than the childless couples, and parents with two children hardly less than those with one child.

49. The budgets on which the above figures are based are not very suitable for studying the behaviour of surplus expenditure (i.e. the disposal of income on non-essential items) for in these budget collections no information was obtained on total income or on total savings, and the sums spent on drink and tobacco are certainly under-stated. A collection of budgets made during the war in various towns by Mr. Charles Madge is not subject to some of the defects just mentioned ; in particular it is possible to trace the disposal of the total income, including savings. Tables XV and XVI based on this material show two aspects of the effects of adding children on family expenditure. Table XV shows the proportion of his income which the husband handed over to his wife, in the families investigated in Glasgow.

TABLE XV
Percentage of Earnings given by Husbands to Wives in Families of Different Sizes

Number of children in family	Husband's earnings (shillings per week)			
	Under 70/-	70/- – 100/-	100/- and over	All families
0	78	75	42	64
1	84	79	65	73
2	86	77	65	72
3	87	81	69	77
4 or more	87	86	72	82

50. The percentage of earnings given to the wife increases with the number of children, but the increase is less than the cost of the child's upkeep and with the addition of more than one child the increase is very small.   Over the whole of the families covered in this inquiry, " the extra allowance to the wife is 7s. 8d. for the first child.   A wife with two children gets 3s. 4d. extra per child, and the wife with three children gets 3s. 8d. extra per child "(¹).

51. In contrast to the parents' reluctance to decrease their expenditure on tobacco, we may consider their attitude to savings, which is at the other extreme.   Table XVI shows the percentage of families in Mr. Madge's inquiry in which no National Savings were found.

TABLE XVI
Percentage of Families with no National Savings

Type of family	Percentage with no Savings
Man and wife	41
Man and wife; 1 child	53
Man and wife; 2 children	63
Man and wife; 3 or more children	75

52. It will be seen that savings disappear from the budgets of many families as the number of children is increased.

53. From this discussion of the various ways in which parents meet the extra cost of bringing up children compared with childless couples having the same income, a few general conclusions can be drawn: —

(1) Parents have to make considerable economic sacrifices to bring up their children.   (2) Children in larger families have a lower standard of living than children in smaller families.   (3) Both these propositions are true at all income levels.   (4) Even at relatively high income levels parents meet a large proportion of cost of their children by reducing their expenditure on necessaries (e.g. clothing) and buying cheaper kinds of goods to satisfy their requirements (e.g. food).   The cost of children is not met only by spending less on luxuries.

54. Giving the same income to all the workers in a trade, on the principle, say, of the " rate for the job ", means a very different standard of living for persons with different numbers of dependants.   Because this is true at all, or nearly all, income levels it follows that to increase the general standard of living will not, of itself, even out the inequalities between men with various numbers of dependants.   If it is regarded as important to reduce these inequalities, that aim can be achieved only by measures specifically designed to redistribute income in favour of parents.

E. The Cost of Children

55. On the basis of these budget figures it is possible to give a tentative answer to what is perhaps the most important question from the point of view of the economic aspects of population policy.   This question may be put as follows : How great an addition in income is needed to make parents as well off as a childless couple?   The cost of a child to a family which is contemplating an addition of a child can be expressed as that increase of income which enables the parents to pay any additional expenditure occasioned by the child and then to have the same income left over for their own use.   If

(¹) C. Madge, *Wartime Patterns of Saving and Spending* (Cambridge, 1943), p. 59.

income (say in the form of family allowances) increases by less than this, then the addition of a child reduces the income available for the parents ; the standard of living of the family is reduced. If income increases by more than this then the addition of a child raises the family standard of living— bearing children becomes a source of profit. On certain views of the purpose of family allowances, this increase of income which would leave the standard of living of the family unchanged would form the goal of a system of allowances ; on any view of their purpose a discussion of the amount of this increase is relevant.

56. The amount of this income could not be fixed exactly, even if the statistical material available were perfect. It has been seen above that the effect on the distribution of expenditure, of adding children to the family is not entirely the same as the effect of reducing the income. Parents of children differ in needs and in tastes from childless couples. It follows that it is not possible to decide exactly under what circumstances a parent is as well off as a childless person whose income is less. In order, however, to obtain an approximate estimate of the quantity of income needed to compensate parents for the cost of children, it is possible to proceed as follows. Suppose that there is some item of expenditure, which, like adult clothing, is not incurred at all on behalf of children, and which meets a need which does not change (substantially) as the number of children in the family changes. If such a commodity or group of commodities can be found, we may ask how much money must be added to the income of a childless couple earning £X per week to enable them to spend the same sum on, say, adult clothing, even if they have children to look after, as they spend before the arrival of the children.

57. Studies made for the Royal Commission show that the commodity which best meets these necessary requirements is adult clothing. On the basis of the figures of adult clothing which are presented in Table XV, the procedure may be illustrated.

TABLE XVII

Expenditure on Adult Clothing for Childless Couples, and Couples with
Two Children

No CHILDREN

	Expenditure Range					
	40/– to 50/–	50/– to 60/–	60/– to 70/–	70/– to 80/–	80/– to 90/–	90/– to 100/–
Number of Budgets	33	53	64	38	33	16
Expenditure on all Items	547	663	790	892	1,012	1,125
Expenditure on Adult Clothing	25	39	48	55	62	65

TWO CHILDREN

Number of Budgets	8	23	35	26	20	13
Expenditure on all Items	555	653	774	891	1,019	1,140
Expenditure on Adult Clothing	16	20	28	33	49	53

58. It will be seen from Table XVII that (1) for any given number of children expenditure on adult clothing increases as total expenditure increases, (2) for any given total expenditure expenditure on adult clothing decreases as the number of children increases. As it happens, in some of the groups of expenditure the quantity spent on adult clothing by families with two children is the same, or almost the same, as that spent by childless couples in some other groups where the total expenditure is less. We may select for purposes of comparison the group of childless couples whose total expenditure lay between 60s. and 70s. per week, and the group of couples with two children whose total expenditure lay between 80s. and 90s. per week. It will be seen that, to the nearest penny, the childless couples mentioned were spending 48d. per week on adult clothing, while the couples with two children were spending 49d. Measured by the amount they were able to spend on adult clothing, these two groups of families had roughly the same standard of living ; but the average total expenditure of the former group was 790d. per week while that of the latter group was 1019d. per week. The difference between 1019d. and 790d. is 229d. and thus may be used as a rough measure of the amount of additional income necessary to enable parents with two children to spend the same amount on adult clothing as childless parents with a total weekly expenditure of 790d. This amount, which may be called the compensating variation of income, represented about 30 per cent. of the expenditure of the childless couple.

59. More thorough study of these figures (which, as may be seen from Table XVII, are based on small numbers and show various irregularities) suggests that the income needed to compensate parents for the addition of two children to the family probably lies between 25 and 40 per cent. of the income of the childless couple. For a total expenditure of about £3 a week[1] it appears that the compensating income, which leaves parents with two children at the same level as the childless couple, was perhaps about 20s. a week in 1937-38[2].

60. Study of these budget figures also shows that the compensating income variation is probably higher for the first child than for the second. As a rough approximation it would appear that of the 20s. per week about 11s. are due to the first child and 9s. to the second. It is in fact reasonable on general grounds that the cost of children should decline as the size of the family increases because certain items of expenditure need not be incurred to the same extent for subsequent children as for the first child ; for example clothing can be passed on from an older child to a younger child.

61. These estimates provide some kind of rough measure by which the adequacy of family allowance schemes can be assessed[3].

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[1] This is somewhat less than the modal (or "typical") expenditure level of working class families from whom budgets were collected in 1937-38.

[2] The more detailed analysis of these figures will be found in A. M. Henderson, "The Cost of a Family", *Proceedings of the Manchester Statistical Society*, 1948-9 ; J. L. Nicholson, "Variations in Working Class Family Expenditure" to appear in *Journal of the Royal Statistical Society*, 1950 ; A. M. Henderson, "The Cost of Children, Part II" to appear in *Population Studies*, 1950.

[3] They are, however, definitely on the low side. They take no account of savings, nor of that most important commodity, leisure. The parents of two children with 20s. more to spend than the childless couple may spend as much on adult clothing as the childless, but they (particularly the wife) certainly have far less spare time. If they had more money they might buy more leisure— e.g., pay for domestic help. Another reason why the figure is too low lies in the exclusion of London budgets from the statistical analysis.

62. On the other side of the balance, the only increase in income available for purchasing the goods required by the larger family was the allowance for income tax purposes. In 1938-39 the allowance was £60 per child, so that the total tax liability of a family was reduced by up to £15 a year for each child. This relief, of course, could only affect families paying income tax, so that there was no increase of disposable income for families where the earned income was less than £225 a year, while the increase only reached its maximum for families with two children if income exceeded £545 a year. Thus this contribution did not affect the lower ranges of income at all and even in the higher ranges of income where the full benefit of the allowance was obtained it does not seriously modify the conclusion that the standard of living of the large family was substantially below that of the childless family.

63. In addition there were various services supplied to children or for their benefit, free, or at reduced prices. Among them were free education, cheap milk in schools, the school medical service and various maternity services. However, these services do not affect the calculations of the cost of a family ; the calculations are based on budget enquiries made at a time when these services were in existence. Indeed for the family these services formed a very inadequate mitigation of the burden imposed on them by the State which compelled parents to educate their children until they were 14. The expenditure on these services was, however, considerable and should be included in the social cost of children.

PART II

THE POST-WAR POSITION

A. Changes since 1938

64. In the ten years from 1938 to 1948 there have been a number of changes which have operated to reduce the discrepancy between the standard of living of childless couples and that of the larger family. The most important of these are discussed below. On the other hand, there has been one change which operates in the reverse direction : the raising of the school leaving age to 15. The purpose of this section is to examine the nature of these changes. The comparisons made between the pre-war and the post-war position should be taken to refer to the spring of 1938 and April, 1948, respectively. The post-war figures allow for 1948-49 rates of taxation, but not for the effects of the National Health Service Act, 1947([1]).

65. THE RISE IN PRICES. Since 1938 almost all prices have risen. If all prices had risen in the same proportion the relative position of families of different sizes would have remained unchanged. This has not happened. There have been two major influences. First, there has been a relative rise in food prices as compared with prices of manufactured goods. This is a world-wide phenomenon, but its effect in this country has been considerably more than neutralised by the second factor : deliberate government policy. The government has subsidised most rationed commodities and bread, flour and potatoes and it has controlled the prices of most goods of general consumption (rent control is the most important in this respect). On the other hand, heavy taxes have been imposed on drink and tobacco and purchase tax levied on many items which do not form part of a minimum standard of living (as well as on a few which do). The following list gives an idea of the way different groups of prices have moved from 1938 to 1948.

([1]) The study made in this part was suggested by M. J. Bourgeois-Pichat of the French Institut National d'Études Démographiques. He has published his own conclusions in " Population " No. 1 of 1949.

Price Index at March, 1948
(1938 = 100)

Subsidised foodstuffs	143
Other foodstuffs	190-200
Rent	110
Clothing	182
Fuel and Light	170
Drink and Tobacco	302
Other items	182(¹)

These changes have benefited the larger families since these families spend a larger proportion of their income on the goods that have been subsidised than do the childless. The low level of rents has not given the same benefit to families with children since expenditure on rent does not increase with the size of family. This can be illustrated from pre-war figures of consumption:

TABLE XVIII

Proportion of Income spent on Subsidised Foods and Rent by Working-Class Families in 1938

	Number of children in the family			
	0	1	2	3
	Per cent.	Per cent.	Per cent.	Per cent.
Expenditure on subsidised foods per cent. of total *food* expenditure:				
Excluding London	67·3	66·6	70·0	72·0
London only	63·7	65·7	65·0	63·9
Expenditure on subsidised food per cent. of total expenditure:				
Excluding London	23·9	25·2	27	32
London only	20·5	23·9	25·4	27·9
Expenditure on rent per cent. of total expenditure:				
Excluding London	14·7	13·9	13·2	13·1
London only	19·6	18·9	17·1	17·3

Thus the family with three children devoted an extra 8 per cent. of its total expenditure to subsidised foods as compared with the childless family. With the introduction of rationing which covers most of the subsidised foods, it is likely that the difference would be much greater in 1948 than it was before the war.

66. The next task is to assess the importance of the changes in relative prices as causes of the improvement in the position of the family which has occurred since 1938. On the basis of pre-war consumption habits, this does not appear to have been very considerable. This statement must not be misunderstood; it means that the price changes acting alone would have benefited the larger families only to a small extent. In fact, however, many other changes have occurred—they are examined in detail in the following paragraphs—and their combined effect would probably be to alter considerably

(¹) These indices are based on pre-war consumption in working-class households—only in the case of the category " other foodstuffs " does it make much difference which family size or income is taken. The index for subsidised foodstuffs is somewhat lower—141—on the basis of March, 1948, rations (and pre-war consumption of bread, flour and potatoes).

the figures of Table XVIII. Thus, to say that the change in relative prices has contributed comparatively little to the improvement in the position of the family since 1938 is not the same thing as saying that a reversion to pre-war relative prices would not seriously worsen the position of the family. Since we do not know the post-war pattern of consumption, statistical enquiry can only attempt to answer the question as to the effect of the price changes in isolation in benefiting the family and not the alternative question as to the effect of their reversal([']). This procedure is appropriate, so long as it is not supposed to answer questions which it does not purport to answer.

67. On the basis of the Ministry of Labour Budget Enquiry of 1937-8, price indices have been calculated for various family sizes and income groups. These are shown in Table XIX:

TABLE XIX
Price Indices—March, 1948
(March 1939 = 100)

	Food only			All Items except Alcohol and Tobacco			All Items including Alcohol and Tobacco		
Number of Children	0	1	2	0	1	2	0	1	2
Total Expenditure per week in 1938:									
40/– to 50/–	157	160	158	155	156	159	171	170	169
60/– to 70/–	160	161	159	157	160	157	175	177	175
90/– to 100/–	164	163	162	163	161	163	185	184	181
Annual Income of Head of Household in 1938:									
£250–£300		164			167			174	
£500–£700		166			173			178	

Note:

Working Class budgets from the Ministry of Labour Enquiry; Middle Class budgets from Philip Massey, *Journal of the Royal Statistical Society*, Vol. CV, Part III, 1942, see para. 32. Price data have been obtained from Manchester and Liverpool Co-operative Societies and from Ministry of Labour figures.

These indices somewhat underestimate the gain to the family with children. As can be seen from Table XVIII, the family with three children would derive considerably more benefit from the low prices of subsidised foodstuffs than would smaller families. Thus the price indices for families with three children would be one or two points below those for two children; and those for larger families would probably be lower still. Even so, the contribution of price changes to the relative improvement of the position, as compared with 1938, of the family with several children is probably fairly slight. The reason is twofold; the government subsidies have been largely absorbed in offsetting the relative rise in world food prices and, in addition, although, in 1938, larger families did spend a larger proportion of their income on subsidised goods than very small families, yet the difference was not then very great. Government action has probably been more successful in helping the poorest families relatively to the better paid workers than it has been in helping the family with two or three children relatively to the childless.

([']) The distinction is that between the use of Laspeyre and Paasche indices of prices; we are in the usual position that weights for the most recent period are not available.

Taking the columns headed " All Items except Alcohol and Tobacco " it will be seen that the price rise discriminates sharply in favour of the poorer groups.([1]) This is explained by the fact that the distribution of income between categories is much more sensitive to changes in total income than it is to changes in family size (this has been illustrated in Table X).

68. It is possible to examine in detail the effect of the food subsidies on the relative position of families with children. In October, 1948, the subsidies were running at the rate of £471.4 millions.([2]) But it is important to distinguish between three categories of subsidy. First there are the subsidies on rationed goods for general consumption. Since these are paid on goods whose prices are strictly controlled, their predominant effect must be to reduce the retail price of the subsidised goods. Secondly, there are the welfare schemes—the provision of milk in school, National Milk and other welfare foods. These are all schemes directed for the benefit of children or pregnant mothers and are therefore more easily treated separately. Furthermore, the policy questions are quite different ; if it were decided to abandon the policy of food subsidies, this would not automatically involve the abandonment of these schemes—one of which is indeed much older than this policy. The welfare schemes are dealt with in paras. 72-3 and not in this paragraph. Finally there are subsidies to feeding stuffs and fertilisers. These subsidies doubtless cause some retail prices to be lower than they otherwise would be : it would be impossible, however, to estimate the effect of their removal on specific prices, or the extent to which the benefit is retained by the farming community. They cannot be distinguished in their effects from any other aid to agriculture and are considered in the following paragraph. The food subsidies are divided as follows :

	Cost in £ millions
Standard food subsidies	358.7
Welfare Schemes	37.9
Fertilisers and feeding stuffs	74.8
	471.4

Under this heading we are concerned solely with the first of these categories. On the assumption that everyone buys the full ration and that consumption of bread, flour and potatoes is the same as in 1938, the value of the subsidies to families of different sizes can be estimated. It is 4s. 8d. per week for childless families, 6s. 8d. for families with one child and 8s. 6d. for families with two children. This part of the subsidy costs rather less than £300 millions. The rest of the subsidy is paid on extra rations, on the increased consumption of bread, flour and potatoes and on food used other than by

([1]) It is convenient to take these columns rather than " all Items including Alcohol and Tobacco " since the budget data for drink and tobacco are known to be very unreliable : it would appear that only 14 per cent. of the expenditure on drink and 66 per cent. of expenditure on tobacco was reported by working-class families. For these budgets it has been possible to allow for this understatement, but for middle-class families the degree of understatement is not known and no allowance could be made. Thus these indices are too low for middle-class households. It is likely, however, that working-class households spend a larger proportion of their income on alcohol and tobacco than do middle-class households. To the extent to which this is the case the heavy taxation of drink and tobacco is regressive and offsets the effect of subsidies and purchase tax in benefiting the poor relative to the rich. That this is only a partial offset is suggested by Mr. Dudley Seers' estimate of the middle-class cost of living index on the same base at about 200.

([2]) Mr. Strachey in reply to a Parliamentary Question, 1st November, 1948.

households (restaurants, canteens, schools, etc.). The contribution of the subsidies in reducing the cost of school meals will be treated under that heading. Apart from this, the contribution of subsidies is about 2s. per head per child, and about 2s. 9d. per head for adults (the difference being largely due to the fact that most of the subsidy paid in respect of food eaten outside the home accrues to adults).

The subsidies to agriculture present a more complicated problem. These are paid either direct to farmers or on the goods farmers buy, and they result either in raising the income of farmers or lowering the price of the product. There is no way of discovering how the gain is divided between farmers and consumers or of knowing which particular consumers gain. There is a further difficulty: to a large extent these subsidies are intended to enable British farmers to sell at the same price as foreign farmers who are producing under more favourable conditions ; to this extent, there is no gain to the consumer from these subsidies if the alternative were to buy from foreign sources. Thus, these subsidies are the cost of the self-sufficiency policy which has been adopted to meet the British foreign trade deficit. In this they present quite a different problem from that of the food subsidies on goods of general consumption. It would seem, therefore, preferable to consider the effect of the food subsidies on the basis of the figures of the previous paragraph. To do so would, however, be to underestimate their contribution both to poorer families and to larger families. The following calculations considerably overestimate this contribution, and provide an outside limit. The subsidies to agriculture are([1]):

([1]) The following are the details of the increase in agricultural subsidies from 1938 to 1948.

SUBSIDIES TO AGRICULTURE, 1948-49
United Kingdom
(*Net of Appropriations in Aid*)
Ministry of Agriculture and Department of Agriculture for Scotland

	£
Purchase and storage of tractors	2,667,500
Grants for ploughing grassland	3,950,000
Subsidy to hill sheep and hill cattle	5,057,000
Rehabilitation of hill farming land	808,000
Contribution to cost of lime	4,000,000
Crop acreage payments—potatoes	14,380,000
Crop acreage payments—wheat	2,868,000
Crop acreage payments—rye	212,000
Grants in respect of rearing calves	6,499,500
Grants for the assistance of marginal agricultural production	300,000
	£40,742,000
Ministry of Food	
British Sugar Corporation	3,000,000
Animal feeding stuffs and fertilisers	74,800,000
	77,800,000
Total all subsidies	£118,542,000
— Less subsidies in 1938-39	
Oats and barley	203,000
Beet sugar	2,550,000
Livestock	1,250,000
	3,903,000
Increase of Agricultural Subsidies	£114,639,000

All doubtful cases (Women's Land Army, the cost of the War Agricultural Executive Committees) have been excluded. (Compiled from the *Civil Estimates, 1948-49 and 1938-39*.)

£ *millions.*

Fertilisers and Feeding Stuffs	74.8
Net Agricultural Subsidies 1948-49	43.7
Less subsidies 1938-9	− 3.9
	114.6

If the benefits are assumed to be divided equally among all the inhabitants of the country independently of age and income the benefit to each is £2 9s. a year, or elevenpence a week.

70. It is possible to compare actual price indices (column (a) of Table XIX) with those which would result if the subsidies are added to the outlay needed to buy at current prices the 1938 budgets. These are not quite the same as the price indices which would result if the subsidies were removed, since in most cases the subsidy is only paid on smaller quantities than those consumed in 1938. A true index would be higher than the figures in Table XIX columns (b) and (c)[1]. The calculation is made both for the standard food subsidies only (column (b)) and for these together with the agricultural subsidies (column (c)).

TABLE XIX

Price Index Numbers March, 1948, with (a) and without (b) Subsidies
(March, 1938=100)

	Food only									All Items including Alcohol and Tobacco								
No. of Children ...	0			1			2			0			1			2		
Total Expenditure per week in 1938:	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)
40/– to 50/– ...	157	182	192	160	193	207	158	196	212	171	181	185	170	184	190	169	187	195
60/– to 70/– ...	160	179	186	161	185	195	159	191	205	175	182	185	177	187	191	175	189	195
90/– to 100/– ...	164	180	186	163	184	193	162	187	197	185	190	192	184	191	194	181	190	194

This table makes it possible to assess the consequences of subsidies for families with up to two children. Without them food would have risen in price more than other goods. This would have caused a serious worsening of the position of the poorer family and the family with children, and caused prices to rise almost equally for all sections of the working class. The effect of the subsidies has been to keep food relatively cheap and thus to leave families with children in a rather better position relative to smaller families than they had in 1938. If the subsidies were withdrawn, the price index of the foods which are now subsidised would rise from 143 to about 185 (or to 200 if all the agricultural subsidies are included). They would thus have risen in the same proportion as unsubsidised foods and by more than any other category of working class expenditure except drink and

[1] Thus the ordinary price index is: $\frac{Y_1}{Y_0} \times 100$, where Y_0 is the income enjoyed in 1938 and Y_1 the income required at 1948 prices to buy the same goods as were bought in 1938. These indices are $(Y_1 + S)/Y_0$ where S is the amount of the subsidy.

tobacco. The food subsidies including the agricultural subsidies involve a reduction of 13 per cent. in the cost of living for two-child families at the lowest income level and of 4 per cent. for the childless families earning £5 a week in 1938.

71. FAMILY ALLOWANCES. Since 1938 a family allowance of 5s. per week has been introduced for each child after the first.

72. INCOME TAX. The exemptions and allowances are now almost the same as in 1938. Their significance is, however, very different, owing to the rise in the rates of wages and salaries. In 1938, 3,700,000 persons paid income tax, in 1946-7, 12,250,000. Thus, whereas before the war the childless couples with working class incomes were exempt from income tax, now most such families pay some income tax. A much larger number of families with children benefit from some remission of taxation than was the case before the war. Further, since taxation is at a higher rate than before the war the value of the allowance of £60 per child has risen and the maximum remission of tax burden is now £27 a year for each child.

73. MILK SCHEMES. In 1938, 55 per cent. of children attending school obtained $\frac{1}{3}$ pint of milk per day for a halfpenny; now 90 per cent. obtain the same amount free. The value of this scheme has been taken as the value of this milk at current prices less the contribution made in 1938 by the more limited scheme then in operation. In addition there are now schemes for supplying milk free or at reduced prices to pregnant and nursing women and children below school age (the National Milk Scheme). These schemes have been valued at 6d. per week for school children and 28 pence per week for children below school age. In obtaining these figures, the milk supplied to pregnant and nursing women is attributed to children under five.([1])

74. SCHOOL MEALS. The contribution of school meals to the family is more complicated. Children pay for the cost of the food supplied but not for the other costs of providing the meals, and there are provisions for remitting all or part of the cost of food for families whose income falls below certain limits. The provisions for excusing payment are not published but it appears that only families with a very low income or a large number of children benefit from the remission. Thus, most children in small families will pay the cost of the food which is 5d. or 6d. per meal. The contribution of the State then consists of the cost borne by the Exchequer for the costs other than food. This amounts to £3 1s. 0d. per annum or 14 pence per week for

([1]) The calculations are as follows: the annual cost of the milk in schools scheme for 1947-48 was £11,500,000 (*Civil Estimates,* 1947-48, Class X 3, p. 50; *H. of C. Paper 48x* of February, 1947). This has to be divided among 6,619,000 children aged 5-14. This gives £1 15s. 0d. per annum per head or 8d. per week, from which must be deducted the value of the pre-war scheme which averaged 2d. per head. This is consistent with the standard allowance of 5/3 pints per week at 5d. per pint, or 8¼d. per week. The National Milk Scheme for children under five and expectant mothers and nursing mothers cost £23 million (ibid.), divided among 3,818,000 children under five, giving £6 per head per annum or 28d. per week. All figures for the special milk schemes are independent of the subsidy of ¼d. per pint on all milk sold for human consumption in liquid form. This subsidy, which is presumably not intended to form a permanent part of the redistributive policy, is included in the figures of subsidies in Section 68.

each schoolchild([1]).   In addition to this the family benefits to the extent of the subsidy on the foodstuffs supplied in school meals([2]).   This can be estimated as follows: Since only half the children take school meals on any day (in many areas this is due to the limited accommodation available) the value of food per pupil per week is about 1s., which suggests that the cost of the subsidy per week per child is about 4d.([3]).   The total aid to the family from the provision of school meals thus amounts to 18d. per week per child.

75. R A T I O N I N G.   The war has brought with it rationing schemes which have had a considerable influence on the position of the family.   The addition of a child to the family now involves an increase in the number of ration books.   This is likely to benefit the parents, unless they are so poor as to be unable to afford to buy their rations.   One advantage is that it is easier to use the rations economically the more there are of them.   Further, more rationed foods will be available for the parents if children's rations are larger than the amount by which, in the absence of rationing, the family consumption would have risen with the addition of a child to the family.   Where this is the case, the parents are better off than childless couples, if in both families the parents have the same amount to spend on themselves.   For working class families the available data enable a calculation of the extent to which children help with the rations.   It is possible to calculate the amount by which families would have to increase their expenditure on rationed goods, beyond the amount at present allowed, in order to maintain the pre-war consumption of these commodities.   The figures are shown in Table XX.   In almost all cases the deficiencies are lower for the larger families.   The deficiency of the rations below pre-war consumption rises with total expenditure, as would be expected.   When children are young they add considerably to the amount of rationed goods available for their parents.   Older children in the higher income groups may well increase the ration deficiency.   No figures can be given to confirm this, since budgets are not available which distinguish the age of the child.

([1]) The estimated expenditure for school meals is (in million pounds):

	Running Costs (Net of Parents' contribution)		Capital Expenditure	
	1947–48	1948–9	1947–8	1948–9
England & Wales ...	16·7	21·0	4·2	6·9
Scotland	1·8	2·3	0·7	0·6
Great Britain	18·5	23·3	4·9	7·5

The 1947-48 figures have been used and divided by the number of pupils at grant aided schools. Capital expenditure has been excluded because it represents the duplication of equipment in fact available in the home and is thus only of benefit to the family in that it makes it possible to supply the other benefits.

([2]) The logical position of this element is a matter of judgment. If the abolition of subsidies would involve an increase of the charge made to parents for school meals it should have been included with the general treatment of subsidies in Section 68. If, on the other hand, this abolition would leave the charge to parents unchanged and merely transfer the burden from the Ministry of Food to the Ministry of Education, it is more appropriate in this paragraph. Its inclusion here is not intended to prejudge this issue—which does not arise if the subsidies will in fact be retained ; it is dictated solely by convenience in the presentation of the figures.

([3]) An exact figure cannot be given because the composition of the food served in school meals is not known.

TABLE XX

The Ration Deficiency
(Pence per Week)

Total Expenditure 1938					No child	One child[1]	Two children [2]
40/– to 50/–	...	...	...	...	...	109	35	60
60/– to 70/–	...	...	...	...	...	144	131	89
90/– to 100/–	...	...	...	...	...	213	146	133

76. There is no wholly satisfactory way of allowing for the effect of rationing on the standard of living of a family. As compared with the pre-war position, a family is worse off even though its income rises by just sufficient to enable it to afford the pre-war collection of goods, if in fact rationing prevents it from buying these goods. There must be some further rise in its income which will enable it to replace the goods which it is prevented from buying by other goods which give equal satisfaction. A formula prepared by Mr. J. L. Nicholson[3] suggests that a ration deficiency of 1s. would require an expenditure of 1s. 6d. if the same satisfaction is to be obtained. Thus the gain from the addition of a ration book to a childless family is one-half the difference between the ration deficiency of a family without children and that of a family with one child. It cannot be claimed, however, that this measure is very accurate, but to ignore the effect of rationing on the position of the family because no precise measure is available would involve leaving out one of the important consequences of rationing.

77. School meals imply an additional aid to the family because they reduce the pressure on the rations. If the cost of rationed foods is half the total cost of the food, this would imply that the value of the school meals in reducing the ration deficiency can be put at about 4 pence per week per child.

B. The Combined Effect of the Changes since 1938

78. It is possible to combine the effects of these different changes in the position of parents. This is done in Table XXI.

It will be seen that the changes of the last ten years have had the effect of adding about 7 per cent. per child to the purchasing power of a family. Except in the case of the family earning £1,000 a year—for which tax would have been payable pre-war—the purchasing power of families at the same point on the income scale in 1938 would have been the same, independent of the number of children.

[1] The child is assumed to be between 5 and 14.

[2] One child under 5 and one between 5 and 14.

These figures include the deficiency due to the rationing of: meat, milk, butter, margarine, bacon, eggs, sugar, tea, jam, cooking fats and soap. The rationing of clothes and sweets has not been taken into account because, in these ranges of income, pre-war consumption was less than the amount allowed by the ration.

[3] Rationing and Index Numbers, *Review of Economic Studies*, Winter, 1942-43.

TABLE XXI
Net Income of Different Families
(Pounds per Year)

Earned Income	£300			£500			£1,000		
Number of Children (1)...	0	1	2	0	1	2	0	1	2
Family Allowance ...	0	0	+ 13·0	0	0	+ 13·0	0	0	+ 13·0
Income Tax	− 10·5	nil	nil	− 58·5	− 40·5	− 26·8	−234·0	−207·0	−185·7
Milk Schemes	0	+ 1·2	+ 7·3	0	+ 1·2	+ 7·3	0	+ 1·3	+ 7·3
School Meals:									
Exchequer contribution	0	+ 3·0	+ 3·0	0	+ 3·0	+ 3·0	0	+ 3·0	+ 3·0
Food Subsidy	0	+ 0·8	+ 0·8	0	+ 0·8	+ 0·8	0	+ 0·8	+ 0·8
Net Income ...	289·5	305·0	324·0	441·5	464·5	497·3	766·0	798·0	838·4
Relative, Childless families = 100	100	105·3	111·9	100	105·2	112·6	100	104·1	109·4
Ration Deficiency (2) ...	− 14·1	− 11·9	− 9·8	− 22·8	− 15·8	− 14·1			
Contribution of School Meals to reduce Ration Deficiency	0	+ 0·8	+ 0·8	0	+ 0·8	+ 0·8			
Total	275·4	293·9	315·0	418·7	449·5	483·2			
Relative, Childless families = 100	100	106·8	114·5	100	107·3	115·4			

79. The assistance given to families is considerable though it doubtless still leaves much of the burden to be met by the parents. It should further be noted than some of these measures are the result of deliberate policy, while others are the accidental result of war-time measures which were not specifically intended to improve the relative position of the family. Thus, if the economic pressure in this country should be relaxed we may return closer to the pre-war position. A reduction of rates of income tax would, of course, benefit both parents and the childless but it would make the present tax allowance for children less important. The same would be true of the abolition of rationing (prices remaining constant) which again would benefit all families but would give most benefit to those whose consumption is most severely limited by rationing—that is, the smallest families.

80. In §59 a rough estimate was given of the addition to income which would be required in 1938 to compensate for the cost of a child and leave the parents as much to spend on themselves as a childless couple earning £3 a week. This estimate can now be brought up to date. The various factors are shown in Table XXII.

While these figures cannot claim a high degree of accuracy, they are suggestive. Apparently the cost of a child to its parents at a low working class level of income is substantially unchanged as compared with the pre-war figure, despite the large increase of prices and incomes. Thus the burden of two children which, at this income level was about one-third of a childless couple's income has now fallen to one-sixth. The effect of the war-time measures in assisting parents has been very far from negligible, though it has not freed the parent from the whole burden(3).

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(1) The same assumption is made about the age of the children as in the previous table.

(2) Information is not available of the ration deficiency for richer children.

(3) Another calculation at a rather lower level of income (£2 10s. per week in 1938) gives the result that the cost to the parents of a second child is nothing at all. This results from a lower estimate of the cost of a child in 1938, than that of § 59.

TABLE XXII
The Compensating Variation of Income 1938 and 1948
(Shillings per Week)

Number of Children	0	1	2
Income required in 1938 to maintain standard of childless couple earning £3	60/–	71/–	80/–
Cost of purchasing the same goods in 1948 (Price Index 175)	105/–	124/3	140/–
Less Family Allowance	—	—	5/–
Less School Meals and Milk Schemes	—	1/11	4/3
Plus Ration Deficiency	5/6	4/3	3/5
Total Net Income Required	110/6	124/7	134/2
Income Tax Payable	3/9	1/3	Nil
Gross Income Required in 1948	114/3	125/10	134/2
Extra Income required to maintain the standard of a childless couple	—	11/7	19/11

81. RAISING THE SCHOOL-LEAVING AGE. All the changes so far considered reduce the disparity of living standards between parents and childless couples. The raising of the school-leaving age, however, means that whatever burden remains lasts a year longer. Further the burden is prolonged when it is heaviest ; the cost of a child of 14 is certainly greater than that of a small child. Not only has the cost to be borne by the parents for an extra year but the average cost over the whole life of a child has been increased. Here again no measurement is possible with the available information. An indication of one estimate of the cost is the 16s. per week which is paid for children boarded out (see §84). The cost cannot exceed the earnings which a child of 14 could obtain if the school-leaving age had not been raised—since he must be maintained in any case—but is likely to be considerably lower, since children who are earning are normally allowed more pocket money than children of the same age still at school. The earnings of children of 15 are now about 25s. per week.

C. Some other Considerations Relative to Family Allowance Policies

(a) *The Subsistence Minimum for Children*

82. In past discussions of family allowances, considerable importance has been attached to the idea that all parents should be put in a position to provide for their children the necessities of physical health. To obtain an idea of the magnitudes involved (there is a certain vagueness inherent in the idea of a minimum standard) it is perhaps best to have recourse to Lord Beveridge's estimate of the minimum cost of covering the subsistence needs of a child. This estimate has been recalculated at 1945 prices. The allowances for each item (food, clothing, etc.) have been increased in accordance with the rise in prices of the different classes of commodities(¹). Lord Beveridge's estimate of 7s. is thus raised to about 9s. This sum consists

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(¹) The Ministry of Labour's Cost of Living Index has been used.

of 7s. 2d. for food, 1s. 6d. for clothing, and 4d. for fuel, light and other expenses. The variation of the estimated subsistence cost with the age of the child may be seen in Table XXIII below.

TABLE XXIII
Subsistence Cost of a Child at 1945 Prices

Age of Child			Subsistence Cost
			s. d.
Under 5	...	...	6 10
5–9	...	...	9 2
10–13	...	...	10 9
14	...	...	11 7
Average	...	...	9 0

83. In using the figure of 9s. it is necessary to keep in mind several qualifications.

1. Prices will almost certainly settle down at a level higher than that of 1945. Food prices, which chiefly determine the estimate, rose by over 25 per cent. between 1945 and the end of 1949 ; and these prices are heavily affected by subsidies.

2. The figure of 9s. makes no allowance for rent. Parents in the lower income ranges economise on rent as the size of their family increases.

3. The figure of 9s. takes no account of services([1]).

(b) Existing Payments in Respect of Children

84. It is of interest to compare with the minimum subsistence costs, as thus estimated, the provisions in fact made by government departments for certain categories of children. According to the Curtis Committee on the Care of Children the total allowances paid to foster parents by local authorities working under the Home Office averaged about 16s. a week in 1946([2]).

These payments should, according to the committee, " cover the cost of maintaining the child " but not " include an element of remuneration ". The committee themselves recommended that a clothing allowance of not less than £12 a year should be included in the allowance to foster parents. It will be recalled that the present rate of general family allowance for all needs, of which clothing is only a small part, is 5s. a week, which amounts to £13 per annum.

85. Secondly, it is of interest to refer to the revised scales of payments for dependent children under 16 years to persons receiving National Assistance. Under the present scales the payments are as follows :—

						s.	d.
Children under 5	...	...	...	...	...	7	6
„ 5-11	...	...	...	...	...	9	0
„ 11-16	...	...	...	...	...	10	6

([1]) The value of the services provided is rapidly changing. The government is at present engaged on an expansion of services (especially school meals) which already provides about 2s. per child per week and is expected eventually to provide more than 3s.

([2]) Cmd. 6922, August, 1946. These allowances usually vary with age.

(c) *The Money Value of Provision in Kind*

86. In discussions of measures to relieve the burdens of parenthood, comparisons are often drawn between allowances in cash and relief in kind. It should be remembered that any attempt to offset the value of relief in kind against the " cost " of maintaining children involves considerable difficulties. Help in kind in the form of such services as home helps and day nurseries does nothing to meet the needs which enter into the subsistence cost of children (i.e. food, clothing, fuel), or into the extra expenditure of parents as shown in the family budgets discussed in Section IV. Such services, therefore, while they ease the life of parents in many ways or improve the health of the children usually do little or nothing to reduce the money cost of bringing up children. The provision of milk and school meals is the chief exception. Even here it involves an exaggeration of the amount of assistance to parents if the full value of the goods supplied is credited as a reduction of the costs of maintaining children. The advantage of the milk schemes is not only that they reduce the burden on parents but also that they ensure that children consume more milk. The family will not normally curtail the amount of milk consumed at home to the same extent that the children take milk at school. The additional milk consumed is doubtless highly beneficial to the child, but, precisely because it does confer a very specific benefit on the child, it does not relieve the parents of a corresponding burden. Indeed, the case for help in kind to the family is that it encourages the consumption of things which we feel are very good for children and which the family cannot be relied upon to purchase if aid is given in the form of money. To the extent that this aim is achieved the aid fails to raise the general standard of living of the parents. The post-war estimates of the cost of a family to the parents are therefore underestimates.

87. In some cases, indeed, the provision of aid in kind may aggravate rather than relieve the existing costs of parenthood. This has been shown in an investigation of conditions on a Birmingham housing estate. The conclusions arrived at in the investigation are summarised in the following quotation: " While providing a much better environment, the housing estate undermines the families' resources in other respects. The family moving from the slums to a new housing estate on the edge of the city has greater costs to meet out of the same income. Rent is usually higher ; there are increased costs of transport both for business and pleasure, and often for the necessities of illness ; there is usually a need for more furniture, necessitating hire-purchase payments ; wear and tear on clothing, especially on footwear, is generally greater ; children's appetites are increased ; and food prices are higher. To accentuate these higher costs there is sometimes a reduction of income due to women losing the opportunity for part-time work in the city. The resulting strain on the family resources is commonly met by a reduced food expenditure, with consequent reduction in the nutritive value of the diet ".

" The survey illustrates, as numerous others have done, the financial inability of many working class families to maintain for their children a standard of living compatible with full growth and health. The incidence of poverty on children in large families is again evident. As an independent social reform, rehousing has its limitations. It is to be hoped that in post-war planning due provision will be made to couple with rehousing some scheme of allowances or of additional social services which would enable children to reap full benefit from the improved environment of the housing estate."[1]

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[1] *Nutrition and Size of Family*—Report on a New Housing Estate, 1939, by M. S. Soutar, E. H. Wilkins, and P. Sargant Florence.

88. Similar dangers may be inherent in the provision of other services besides better housing—e.g. making use of day nurseries may involve increased outlay on clothing and fares.

D. Further Factors

89. The preceding sections have attempted to cover the cost of maintaining a child. In addition there is the initial cost of maternity. This would not form a heavy additional burden if it could be spread over the whole life of the child ; it is chiefly important because these costs have to be borne over a short period[1]. The costs for different social groups are shown in Table XXIII.

TABLE XXIII
The Cost of Maternity[2]

		Professional and Salaried Workers	Black-coated Workers	Manual Workers	Agricultural Workers	All Married Workers
		£	£	£	£	£
Medical and Institutional Fees	First Births	17·7	9·4	6·0	5·6	7·9
	Subsequent Births	16·4	6·8	4·0	3·4	5·6
Other Confinement Costs	First Births	3·3	2·0	1·7	2·1	2·0
	Subsequent Births	6·8	2·7	2·3	2·2	2·8
Maternity Garments, Baby Clothes and Equipment	First Births	36·5	33·2	28·0	23·0	29·7
	Subsequent Births	22·5	20·6	16·3	12·0	17·4
Total Cost of Maternity	First Births	57·5	44·6	35·7	30·7	39·6
	Subsequent Births	45·7	30·1	22·6	17·6	25·8

Since the date of the enquiry on which these figures are based, the medical and institutional fees and costs of confinement have been very greatly reduced by the National Health Service Act. Some costs will doubtless still remain to be borne by the parents, especially in the case of professional and salaried workers—40 per cent. of whose children were born in nursing homes. Even in the case of manual workers 7 per cent. of their children were born in nursing homes. The cost of maternity garments, baby clothes and equipment (prams, cots, etc.) was very much greater than the maternity grant of £2 which was paid to the mother before the National Health Service Act. Under this Act the maternity grant has risen to £4 which is still very much below the expenditure incurred. It should be noted that the cost of the first child is much higher than that of subsequent children, and that this discrepancy is

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[1] The figures quoted are taken from *Maternity in Great Britain*, Oxford University Press, 1948. These figures relate to the spring of 1946, since when costs for all services other than medical have probably increased.

[2] Taken from *Maternity in Great Britain*, Oxford University Press, 1948.

proportionately greater for the poorer groups. This is largely due to the fact that clothes and equipment bought for a first child can be made to serve for subsequent children—and this is done more extensively the poorer the famliy.

90. Finally a consideration must be mentioned for which no figures can be given. Where the wife is employed, the main cost of having a child is usually that employment must be abandoned, or, if it is not, that employment must be interrupted and someone must be paid for looking after the child. Where this is the case we must treat either the mother's income or the cost of service as an additional cost of having a child. This element is, in many cases, far larger than any of the costs so far considered. It will be relevant much more often for the first child of a family than for subsequent children, and thus constitutes an additional reason for estimating the cost of a first child above that of subsequent children.

91. The cost, for the wife, of abandoning paid employment has been affected by income tax changes, culminating in the budget of 1948. In 1938, the first £35 a year of the wife's earnings was tax free and any earnings of the wife beyond this were taxed at the rate appropriate to the joint earnings of the husband and wife. Today the earnings of a married woman are taxed at the same rate as if she were a single woman and marriage reduces the taxable income of the husband by £70. The result of these changes is that it involves a bigger sacrifice for a married woman to give up employment than would have been the case if the pre-war tax law had still been in effect.

The Relations between Intelligence and Fertility

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1.   MEMORANDUM BY PROFESSOR SIR GODFREY H. THOMSON

My interest in the connection between intelligence and fertility dates from 1921, when I tested a large number of Northumberland children and, although the experiment was not planned with that end in view, noted facts which seemed to suggest such an association. Since then, usually in conjunction with colleagues or students working under my guidance or in collaboration with me, I have made several experimental inquiries planned to elucidate this problem, and I have read most of the literature.

My general conviction is that there is a negative correlation between the " intelligence " of a child of about eleven years, and the size of the family of which he or she is a member. Of this fact I have no doubt whatever and I am fairly sure that the correlation coefficient is approximately − 0.25 in magnitude. Of its cause I am much less certain, but I think it is largely due to the later marriages of intelligent people, their restraint in producing fewer children, and the inheritance of their intelligence by their offspring.

Caution is necessary because it is very difficult to disentangle, in the estimate of a child's " intelligence," that part which is his inborn potential intelligence, and that due to his education, his home, his environmental chances. For it is conceivable that children of small families have, in a general way, better home environment, better schooling, and a better social inheritance and that this may explain their better performance in tests of intelligence which, do what one will, still to some extent favour the " better educated " child. I do not myself think that environment and social inheritance explain more than a fraction, at most half, of the negative correlation actually observed, but it is difficult to test this. I shall describe below some attempts I have made to do so. First, however, let me expand my statement that (whatever may be its cause) there is a negative correlation of about − 0.25 between intelligence as measured by an intelligence test, and the size of family to which the tested child belongs.

This is not a fact obvious to casual notice. Indeed, the man in the street will usually, in my experience, deny it and vigorously proclaim the many advantages, even the intellectual advantages, of belonging to a large family. An inverse correlation of 0.25 between size of family and intelligence leaves, however, plenty of room for cases where large families are intelligent and small families dull. It only implies that about 60 per cent. of the families are in

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agreement with the tendency, leaving about 40 per cent. of cases of discrepancy. A fourfold table giving a value of $r = -0.25$ would be approximately like this:

Intelligence	Family size	
	Below average	Above average
Above average ...	30 per cent.	20 per cent.
Below average ...	20 per cent.	30 per cent.

No less than 20 per cent of the families, in spite of the prevailing tendency, would be above the average both in size and in intelligence, and 20 per cent. would be below the average in both.

To illustrate this point further I have constructed the following artificial symmetrical grid of 2,050 cases, so as to give a correlation of -0.25. It does not represent any experiment and must not be taken as giving, say, the actual range or distribution of family size. It is merely illustrative. An experimental grid would show families up to 13 and more, and the distribution of family sizes would be skew.

In this grid, in which we may suppose A, B, C, D, E, F, to be grades of intelligence and 1, 2, 3, 4, 5, 6 to be family sizes although the tendency is unmistakeable, and is expressed by the quantitative statement $r = -0.25$, there are nevertheless eighteen $(14 + 3 + 1)$ "only" children who are below average intelligence, and eighteen members of the largest families (here families of six) who are above average intelligence.

An artificial Correlation Grid of 2,050 Cases representing a negative Correlation of 0·25

	1	2	3	4	5	6
A ...	5	18	24	14	3	1
B ...	18	73	114	84	28	3
C ...	24	114	212	192	84	14
D ...	14	84	192	212	114	24
E ...	3	28	84	114	73	18
F ...	1	3	14	24	18	5

Casual observers, moreover, and even people like teachers, or journalists, or clergymen, do not see the whole population but only a selected part of it. They know secondary schoolchildren, or slum children. Their acquaintances tend to belong to a class with large (or with small) families, to a certain occupational or social stratum, and so on. That is to say, they are unacquainted with the whole of the data shown in a grid like the above, and though, of course, they do not actually make a grid, they draw conclusions *as though* from a grid which is only *part* of the above. Suppose we take such a part, say the top left hand quadrant only, where all the families are below average in size and above average in intelligence. That is the part of the data, for example, which will represent the relations, friends, and acquaintances of most of the readers of this memorandum. This truncated grid is

5	18	24
18	73	114
24	114	212

and gives on calculation a correlation of -0.07 only, so small as entirely to escape casual notice. Yet in the whole group of 2,050 the correlation is -0.25, and this is what matters.

My earliest experimental approaches to our problem were indirect, and showed a negative correlation between the tested child's intelligence and the status of the father's occupation on a scale such as the Taussig. Since it was otherwise known that there existed a differential fertility among occupational groups, a negative correlation between the child's intelligence and the number of his sibs could be anticipated.[1] In the years 1925-26 I planned a direct attack on the problem and was assisted by my student Dr. H. E. G. Sutherland.[2] Our subjects were about 2,000 elementary schoolchildren, aged about eleven years, in the Isle of Wight, about 400 boys of the Royal Grammar School, Newcastle-upon-Tyne, ranging from $10\frac{1}{2}$ to $17\frac{1}{2}$ years of age, about 400 pupils of Moray House Demonstration School, Edinburgh, ranging in age from $7\frac{1}{2}$ to 16 years, and 30 boys from Ryde Grammar School in the Isle of Wight, aged from $10\frac{1}{2}$ to 13 years. The tests used were group tests, which admittedly require a good deal of reading, an acquired ability, though one by no means unconnected with native intelligence. The size of family was ascertained by enquiry from the child tested. Only living children will, therefore, as a rule, be included. The elementary schoolchildren gave correlations of $-.154 \pm .023$ for 840 of them tested in one year, and $-.218 \pm .019$ for 1,084 of them tested in another. The 1,084 were a complete age-group except for absences from school on the day of the test, and excluding private schools. The 840 are not complete for they had been " creamed " by departures to secondary schools, hence the less pronounced correlation. The simplest and most striking way of showing these negative correlations is by the diagram on page 85 of the article quoted. A tabular statement of that diagram, here given, is less vivid.

Percentage over Average Intelligence Level

Size of family	Number of cases	Percentage	Number of cases	Percentage
1	77	61	115	66
2	135	63	212	64
3	144	52	185	56
4	133	49	152	54
5	107	51	127	49
6	82	43	103	41
7	59	36	88	34
Over 7	103	37	102	39
	840 in 1925		1,084 in 1926	

The data from the children of the grammar schools and the demonstration school gave smaller correlations—this is to be expected because of the selected nature of these samples. But they were not in discord with the general result. I may quote one table : —

	Average intelligence	Average size of family
1,924 almost unselected children	Not over 100 I.Q.	4·25
395 in a college demonstration school ...	Known to be higher	3·26
386 in a grammer school	112·5 I.Q.	3·11

[1] Duff and Thomson, *British Journal of Psychology.* 1923, xiv, 192. Macdonald, *ibid*, 1925, xvi, 123.

[2] Sutherland and Thomson, *British Journal of Psychology.* 1926, xvii, 81.

Moreover, the average family 4.25 of the Isle of Wight elementary schools is more likely to be an underestimate, due to incomplete families, than is the 3.11 of the grammar school, where the boys were some years older.

The chief blemishes in this research were (i) the use of group tests, which are more diluted by acquired verbal facility, especially reading ability, and (ii) the difficulty of the (possibly) unfinished families. This second difficulty, however, probably leads to an underestimation of the correlation. For if a child of eleven years is one of a small family it is probable that no more children will be born. But if he is a member of a large family it may be still further increased—though clearly much depends on his place in the family. Since the large families in this research are therefore more likely to be unfinished than are the small families, the negative correlations found are more likely to be underestimates than overestimates.

We were chiefly concerned to test the possible explanation that the phenomenon of negative correlation is due to family circumstances and not to inheritance. Dr. Sutherland and I next therefore measured this correlation in a socially very homogeneous group, namely, coal-miners working " at the face." The fathers of this group all belonged to the rank and file of coal hewers, everyone holding any kind of a distinguishing position, even of the lowest grade, being excluded. In 1926, 60,000 school children between the ages of 11 and 13, forming two age-groups attending elementary schools in the West Riding of Yorkshire, were given a group test of intelligence and were asked about their father's occupation and the number of their brothers and sisters. In 3,096 cases the father was a coal-miner (1,106 of the children being twelve-year-olds, and 1,990 being eleven-year-olds. The missing children among the twelve-year-olds had already gone to secondary schools. The 1,990 are a complete group except for absences on that day, probably random).[1] The correlations obtained were, in spite of the very homogeneous home-conditions, still negative $(-0.129 \pm .019$ and $-0.126 \pm .015)$ although not so pronounced as in the inquiry previously described. This, however, is to be expected for mathematical reasons, since selection reduces the quantitative measure of correlation, as was illustrated by my artificial example of 2,050 cases early in this memorandum.

It next occurred to me that I might obtain further insight into the problem if I took a group of fatherless children, in whose case the size of family was at least in part accidental, due to the father's death. I found in 1930 in Edinburgh 123 children born in 1916 or 1917 whose fathers had fallen in the war before these children were a year old. Dr. Sutherland gave a group intelligence test to these,[2] and also to a control group of 116 children with living parents, each child being matched by one of the same sex, same size of family, same age and same school—as far as this proved possible. The correlation of intelligence with size of family was in the fatherless group $-0.19 \pm .059$, in the control group $-0.26 \pm .059$. The difference is, however, not statistically significant.

If the sole cause of the usual negative correlation were the foresight shown by intelligent parents, and if in our particular group of 123 children the size of family were entirely an accident, one would expect no negative correlation in this group. As it is, though the correlation is smaller (i.e., nearer zero) compared with the control group, the diminution is not statistically significant. This experiment therefore fails to support the explanation by heredity: but there are doubts. For even in the case of these fatherless children the

[1] Sutherland, *Journal of Educational Psychology* (Baltimore). 1929, xx, 81.
[2] Sutherland, *Journal of Genetic Psychology* (Worcester, Mass.). 1930, xxxviii, 161.

intelligence of the parents may have influenced the number and the spacing of the children up to the time of the father's death, and produced the negative correlation found.

At the same time we searched our Yorkshire data and collected 724 fatherless children (though not in these cases necessarily fatherless from birth) and a control group of 581 with living parents. The correlations between size of family and intelligence were practically the same as in the Edinburgh groups, i.e., the fatherless children showed a smaller, but not significantly smaller, negative correlation; $-0.19 \pm .024$ against $-0.23 \pm .026$.

After 1931 for nearly a decade I engaged in no further researches on this question, but in 1939-40 Dr. R. R. Rusk of the Scottish Council for Research in Education called my attention to data left by the late Dr. Shepherd Dawson and suggested that one of my students might work it over. This was done by Gerard S. A. O'Hanlon.[1] His article uses more complicated statistical devices than those previously considered and hence does not lend itself to a brief summary, at which the following, however, is an attempt. Over 1,200 children between the ages of five and eight years, whose parents were moving from a slum to a new housing area, had been given an individual Binet intelligence test. For these 1,239 cases Dawson[2] had found a correlation of -0.19 (or -0.12 if only living children were included). After some years they were re-tested, by which time the number still traceable was only 293 and it is these who form the subject of O'Hanlon's paper. Other information included the size of family, room space, nutrition, income, mother's age at marriage, and years married when this child was born. The raw correlation between I.Q. and size of family (total number of births) was -0.27, or -0.137 if only living children were included. When, by the mathematical device of partial correlation, it was estimated what this correlation of -0.207 would be in a group homogeneous in all the other factors mentioned above (room space, nutrition, etc.) the value found was -0.293. These figures are for the whole group of 293. For the group of 28 mothers aged 45 and over, whose families might confidently be assumed to be completed, the raw correlation between I.Q. and the size of family was $-.413$ if we take the total number of births as the size of the family. If on the other hand we take as the size of the family the number of children then alive the correlation was $-.291$. Both these last coefficients are subject to very large probable errors because of the small number, 28, of cases. Various other calculations were made but always there was at least some negative correlation between intelligence and fertility. Among the results two are of interest to us: (1) a small positive partial correlation 0.11 between the child's I.Q. and the parents' age at marriage, probably due (if significant, which is doubtful) to the later marriage of more intelligent parents, and (2) a positive partial correlation (i.e. when other factors are made equal) of 0.27 between the child's I.Q. and the number of years its parents had been married at its birth, which is susceptible of various explanations, one being that the more intelligent mothers are married for a longer time before they have children, and have longer " spaces " between successive children.

This paper is by an author who definitely hoped at the outset that the influence of environmental factors would turn out to be stronger than the influence of heredity on intelligence. His final paragraph reads: " It was concluded that intelligence is little, if at all, affected by congestion in the home ; that better nourished children are more intelligent ; that more intelligent people in this class tend to marry later in life than the less intelligent ; and that possibly the later born children are the more intelligent. Regression

[1] O'Hanlon, *British Journal of Educational Psychology.* 1940, x, 196.
[2] Dawson, *British Journal of Psychology.* 1932, xxiii, 42.

equations tend to confirm these findings. The cumulative effect of the components of the environment makes very little difference to the negative correlation between I.Q. and size of family."

It will be noted that in this research the test used was an individual Binet test. It is therefore less open to the criticism that education, and not native intelligence, is being measured.

If we use these results, and similar results from other workers, as data from which to estimate whether the intellectual average of our race is sinking from generation to generation, an important point to remember is that in all the experiments quoted so far the families have been ascertained through a child of the family, and therefore childless marriages are omitted entirely. Nor are those potential parents who have not married included in the sample. It seems possible, and indeed somewhat probable, that these members of a generation—the childless—are on the average, of high intelligence (consider, for example, the large band of unmarried women teachers). If the tendency is for intelligence to rise as we go from large families to those with few children, with two children, with one child, it seems very possible that it will continue to families with no children ; that is to say, that the unborn children of the unmarried and the childless would have been, on the average, yet more intelligent (though we must remember that the childless group of adults, unlike the groups of parents ascertained through one of their offspring, will contain adults incapable of being parents). If this is so, then a negative correlation of -0.25 does not fully indicate the strength of the forces tending towards a deterioration of intelligence generation by generation. It is true that in a very important research Fraser Roberts, R. M. Norman, and Ruth Griffiths[1] found " only " children a little less intelligent than children with one sib, but they attribute this largely to the fact that illegitimate children were usually returned as having no full sibs. They felt sure that the decrease in average intelligence with size of family was really linear. They are further of the opinion that almost all sources of bias or of error, especially sampling error, would lead to estimates of the negative correlation that would be too low.

Their article is in my opinion the best that has been written on this subject because of the completeness of the sampling and the excellence of the statistical work. My samples were in several cases fairly complete age-groups ; but theirs can be said to be practically quite complete, all children except a mere handful, whose homes were in Bath and whose birthdays were between September 1st, 1921, and August 31st, 1925, being ascertained, 3401 in number, of whom 3,362 were actually tested, most of the missing 39 children having meanwhile left Bath and some having died. The Advanced Otis Group Test was used, but 1,271 of the children had also been given an individual Binet test, so that a check was possible. The Binet I.Q. indeed " showed a significantly higher association with sib number than did Otis I.B.". There was thus " no suggestion that the verbal group test gave too high an estimate because of a possible social bias ".

The statistical procedures adopted were excellent—they were discussed by the authors with Professor R. A. Fisher—and the conclusions are conservative. The correlation coefficient in which we are interested here was -0.224 (living children only included in the family size). Different grades or social strata of the children were separately considered but the detailed conclusions are too complex to summarise here. Pages 208 to 214 of their paper (" Discussions and Conclusions ") should be read with care by everyone interested in this question. I cannot add to what they say, with all of which I am in agreement.

[1] Roberts, Norman and Griffiths, *Annals of Eugenics.* 1938, viii, 178.

It is clear that if there is a negative correlation between size of family and intelligence, and if the explanation is that intelligence is largely an inherited quality and that intelligent people tend to produce smaller families, then the average intelligence will sink generation by generation. There is indeed some direct evidence that this is so.[1] Various calculations have been made based on correlations such as have been discussed in this memorandum, and on the correlation of parental intelligence with that of a son or daughter. The drop in average intelligence quotient has thus been estimated by Cattell[2] to be 3 points per generation, but I think he exaggerates. Fraser Roberts thinks 1½ points. Perhaps even this is an overestimate, but I find it difficult to avoid the fear that the fall may be as much as one point per generation: and this is a serious matter.

Much of course depends on the relative influences of nature and nurture in determining intelligence. There has been a great deal of quite good research done on this, but to go into it would make this memorandum too long. No one thinks that heredity has no influence: doubts arise only when one asks to what extent education can develop potential intelligence or even " create " intelligence. No doubt the Commission has had reports and bibliographies on this from others. I would only like to say that in my opinion the work of the University of Iowa Group in recent years, extolling the power of environmental factors to change intelligence, is invalidated by statistical errors in drawing their conclusions. See for example the criticisms of Dr. McNemar (a competent statistician) in the *Psychological Bulletin* for February, 1940. I think myself that at least half the scatter of intelligence in a community like the United Kingdom would remain even if all environmental handicaps were removed. This statement is, of course, not inconsistent with a belief that there are at present environmental handicaps which ought to be lightened and if possible removed, and that we have by no means reached anything like the ideal of equal educational opportunity at which we ought to aim. Equal opportunity, however, if it removed the danger of a continued fall in intelligence, would not do so by a direct effect, but by lessening the differential incentives: for if intelligent and ambitious parents were assured that their children even if numerous would certainly have every chance to reach what they consider a desirable position in life, they might, and I think they would, have larger families.

2. COMMENT BY PROFESSOR R. A. FISHER

I am in very substantial agreement [with Professor Sir Godfrey Thomson's memorandum], save for one, perhaps small, point. I think Dr. Thomson exaggerates the difference between Cattell's and Fraser Roberts' estimate of the rate of fall per generation in the average intelligent quotient. It should, of course, be made clear that the estimates mentioned by Thomson are on the Binet I.Q. scale, not on the Otis I.B. scale, which is rather more than twice as wide. Fraser Roberts' data for mean intelligence of children belonging to families of different sizes (Table IV, p. 186, *Annals of Eugenics,* Volume VIII) are on an Index of Brightness scale, and give a mean for all *children* of 99.768, compared with a mean for all *families* of at least one child of 103.906, difference 4.138, representing the average fall in intelligence in one generation, ignoring all of the last generation who have no children. If to translate this rate of change into the I.Q. scale we use the regression of Binet I.Q. on Otis I.B., namely, $b = 0.3906640$ (p. 191), the corresponding I.Q. value is 1.6167. If the

[1] For example, E. O. Lewis's investigation. See *Report of the Mental Deficiency Committee* (A. H. Wood, Chairman) H.M. Stationery Office, 1929, especially Vol. IV, and therein page 82.
[2] Cattell, R. B., *The Fight for our National Intelligence.* London, 1937.

regression of Otis I.B. on Binet I.Q. is used, $b = 2.026859$ (p. 192), the value is 2.0418 I.Q. in each generation. If, as appears to be generally agreed, the Binet I.Q. test is more accurate than the Otis I.B., the latter value will be more proper. If Fraser Roberts gives the figure 1.5 ascribed to him by Thomson (which I have not been able to verify) it is somewhat an understatement of what his data indicate. There is in any case no reason *a priori* for supposing that the rate of decline of intelligence is necessarily the same in Leicester and in Bath. For reasons which both authors give, the value of about 2 points I.Q. per generation obtained at Bath and of 3 points per generation at Leicester are doubtless both appreciably underestimates.

A repetition of the same tests with approximately the same numbers at Bath, after a generation, e.g., in 1965, would doubtless show a significant change, in the average intelligence though it would not estimate it accurately, since the standard error of the comparison would be about 0.8 units I.Q. per generation. Such a direct test would include the influence of those leaving no children. In the meanwhile tests closely conforming with that of Fraser Roberts at Bath should be carried out in a number of larger towns.

August, 1944.

3. (a) COMMENT BY PROFESSOR J. B. S. HALDANE

I have read Professor Thomson's memorandum with great interest. His main thesis seems to be fairly well established. Nevertheless there are certain facts which suggest that some of his conclusions might be modified. Where an attempt is made, within a social class, to correlate fertility with parental intelligence, positive correlations are often found. For example, Phillips[1] graded 1899 Harvard graduates of 1899-1901 according to their success and fertility, Class I being eminent, and Class V social failures. The results were as follows:—

Class	1	2	3	4	5
Mean number of children ...	2·19	1·93	1·67	1·12	0·80

The gradient was partly, but not wholly, due to differences in marriage rate. Huntington and Whitney[2] found similar results for Yale. This suggests that if the correlations noted by Thomson imply a negative correlation between parental intelligence and fertility, this may be wholly or mainly due to differences of fertility between different social classes, rather than to differences within a class.

The conclusion that the average innate intelligence of the British population is falling (in so far as a meaning can be attached to such a phrase) is also very possibly true, but does not follow from the data presented. To take an extreme example, "eversporting" stocks (*Matthiola incana*) have single flowers, but over 50 per cent. of their progeny have double flowers, and are therefore completely sterile. Nevertheless the percentage of sterile progeny does not diminish from one generation to another. This is due to a selective process among pollen grains acting in the contrary direction.

Even in existing society there is considerable selection against mental defect, defectives having a higher death rate and less fertility among those

[1] Phillips, J. C. (1927). Success and the Birthrate. *Harvard Graduates' Magazine* xxxv, 565.
[2] Huntington, E., and Whitney, L. F. (1927). *The Builders of America.* (New York).

who survive to maturity than the average. This selection is probably not sufficient to counteract the adverse tendency mentioned by Thomson, but it counteracts it to some extent.

The origin, by mutation, of genes favouring high intelligence, presumably has a similar effect. It is not generally realised that a population spontaneously becomes more variable with time unless the extreme variants are eliminated by natural selection. Thus any quantitative estimate of the decline in innate intelligence seems premature, in the present state of our knowledge.

November, 1944.

(b) POSTSCRIPT

During the five years which have elapsed since I commented on Professor Thomson's memorandum I have devoted a good deal of work to the problem of selection. I am now in complete disagreement with his conclusion as to the effect of differential fertility, which I give in his own words: " If, however, it is due to a tendency for unintelligent parents to have larger families, who inherit the lack of intelligence, it sets a serious problem of eugenics, and implies a steady fall in the national intelligence."

The matter is, of course, complicated by the fact that intelligence, as measured by any test, depends both on innate intellectual capacity and on the environment. But the conclusion would be equally false were intelligence known to be unaffected by the environment like blood group membership, and probably eye colour.

It is known that in general natural selection is conservative, weeding out extreme variants in either direction. For example, very light and very heavy babies more frequently die at birth or soon after than those of average weight. This is also the case with human intelligence. Not only are very intelligent parents less fertile than those of average intelligence or intelligence slightly below the average ; but grossly unintelligent people are even less fertile than the highly intelligent. Idiots and imbeciles have short average lives, and rarely breed. The feeble-minded, though more fertile than could be desired, are less so than the moderately dull. The most fertile group of the population probably has an I.Q. about 70-80, well below the median, but also well above the mental defectives. A simple example will show that in such a case no valid prediction can be made as to the effect on future generations.

Imagine a group of animals, say fish, all of the same shape, but of three different sizes determined wholly by heredity. Their bulks and weights will clearly vary as the cubes of their lengths. Let us suppose the population made up as follows :

25 per cent. small, length 0.8 feet, weight 5.12 lb.

50 per cent. medium, length 1.0 feet, weight 10 lb.

25 per cent. large, length 1.2 feet, weight 17.28 lb.

The average length is thus 1 foot, the average weight is $\frac{1}{4} \times 5.12 + \frac{1}{2} \times 10 + \frac{1}{4} \times 17.28$ or 10.6 pounds.

Now suppose that all the medium fish mate, 50 per cent. of the small ones, and 54 per cent. of the large ones, and that all matings are equally fertile. It follows that $\frac{1}{4} \times 0.5 + \frac{1}{2} \times 1 + \frac{1}{4} \times 0.54$ or 76 per cent. of the fish mate.

The average length of the parents is $\dfrac{\frac{1}{4} \times 0.5 \times 0.8 + \frac{1}{2} \times 1 + \frac{1}{4} \times 0.54 \times 1.2}{0.76}$

or 1.0026 feet.

Their average weight is $\dfrac{\frac{1}{4} \times 0.5 \times 5.12 + \frac{1}{2} \times 10 + \frac{1}{4} \times 0.54 \times 17.28}{0.76}$

or 10.49 pounds.

That is to say the average length of the parents is greater than that of the general population; their average weight is less.   A "eugenist" who measured lengths would conclude that the fish of the next generation would be larger, one who measured weights would conclude that they would be smaller.   Both could not be right.   In fact no conclusion could be drawn until it was known, first how size was determined genetically, and secondly what was the mating system of the fish, that is to say how far, if at all, fishes of the same size tended to mate with one another.   The example given is, of course, artificially simple.   To get a fair analogy with the human case we should need to consider at least a dozen groups of fish.   But the results are similar.

Professor Thomson stresses the need for further research on this problem. I agree.   But I do not think that research on the lines so far adopted is likely to be of value.   For it is obvious that investigations on schoolchildren will tell us nothing about those members of the community who have no children, either because they die young, because they do not marry, or for other reasons.   Such persons are completely ignored, and if it were found that they were below the average in intelligence this fact might well compensate for the selective effect in whose existence he believes.

One reason for doubting the existence of selective effect is that during the middle ages men of academic intellect could only rise socially as priests or monks, who, if they did not always keep their vows, rarely had large families.   Yet Europeans showed marked intellectual ability at the Renaissance.

To conclude, I consider that the existing data give no reason to suppose that the level of innate intellectual capacity in our population is falling.   It may be falling, rising, or stationary.   In view of the marked social changes of the last few years, I do not think that even such researches as those of the Scottish Mental Survey Committee can decide this question, and I consider that the effort devoted to such work could be better spent in other ways, for example in investigating the intellectual level of actual and potential parents as well as of children.

September, 1949.

4.   (a) COMMENT BY DR. J. A. FRASER ROBERTS

I am in agreement with almost every word of this admirable memorandum. The only criticism I have to offer relates to Professor Thomson's views on the estimated fall in intelligence per generation.   He states : " The drop in average intelligence quotient has thus been estimated by Cattell to be 3 points per generation, but I think he exaggerates.   Fraser Roberts thinks $1\frac{1}{2}$ points.   Perhaps even this is an overestimate, but I find it difficult to avoid the fear that the fall may be as much as one point per generation: and this is a serious matter."   Reviewing the available evidence a reasonable approximate estimate can be made without much difficulty, and points to a substantially higher figure than 1 point per generation.

As Cattell's results obtained at Leicester and in Devonshire and those my colleagues and I obtained at Bath appear to conflict, it seems desirable to point out how closely the basic data are in agreement.   The mean family size is 3.42 and 3.58 respectively.   Cattell's tables show that for every advance of the standard deviation in terms of the test he used, family size falls by 0.461 children.   In the Bath investigation the fall in family size for each advance of a standard deviation in Otis I.B. is 0.489 children. This similarity makes it highly probable that provided the same method is used, both sets of data must yield a closely similar estimate of the decline in intelligence per generation.

The figure of 1½ points of Binet I.Q. per generation is quoted from a semi-popular paper in which I said: "a little more than 1½ points." My workings gave 1.6. Professor R. A. Fisher has shown me, however, that in converting units of Otis I.B. into units of Binet I.Q. I had not utilized all the information available regarding the interrelationship of the two tests. The best estimate is actually 2.0 points per generation. The calculation can be made from a table showing mean intelligence test scores for each size of family. The difference between the mean of all children and the mean of all families provides the required figure. Cattell's tables give only the reverse information, i.e. the mean family size corresponding to different intelligence test scores. This allows a somewhat rough and inaccurate estimate. The inaccuracy, however, is likely to be much the same for the two sets of data. Applying this approximate method to the Bath data, the estimated fall per generation is 2.2 points of Binet I.Q. (instead of the correct figure of 2.0); Cattell's material also yields an estimate of 2.2 points.

Investigations on the relationship of intelligence and fertility depend upon testing schoolchildren and counting the number of their brothers and sisters. All authors mention one factor which must tend to lower the association as measured—the fact that some of the families are incomplete. Further information is available about the Bath group which permits an approximate allowance to be made for this factor. The families of the cleverest 4 per cent., the median 4 per cent. and the dullest 8 per cent. of children were studied in some detail and it has been shown (Roberts, *Eugenics Review* xxx: 237, 1939) that the extra children who would be born by the time that all the mothers passed the age of 50 was respectively 0.25, 0.76 and 1.31. Using the same approximate method as above and allowing for its inaccuracy as far as possible the figure for the decline per generation in Binet I.Q. is raised from 2.0 points to 2.6 points.

A number of other factors which cannot be allowed for must affect the estimate ; most of them would increase it, while some would lower it. The most important is the omission of the childless from the record. There can be no doubt that their inclusion would raise the figure for the decline. Altogether, taking all these factors into consideration the most likely figure for the decline in intelligence per generation is about 3 points of Binet I.Q. This is the figure given by Cattell, though, as he explains, it was largely a guess, as he did not deduce it in any rigid way.

The estimate of the fall is not based on any assumptions as to whether differences in intelligence are mainly determined by heredity or by environment—in other words, whether the missing children in the second generation would have owed their superiority over those actually born to superior heredity or to superior environment. Professor Thomson states : " I think myself that at least half the scatter of intelligence in a community like the United Kingdom would remain even if all environmental handicaps were removed." This is conservative. A review of the literature points to a figure of more like three-quarters of the variability as being due to heredity.

The association between intelligence and infertility could be ascribed to an indirect effect depending on the differences in fertility between different social classes or to a direct association independent of social class. Actually, of course, both are true. Professor Thomson quotes some excellent evidence which indicates that the direct association, independent of any differences in socio-economic status, is the more important. This conclusion is reinforced by the findings of J. C. Chapman and D. M. Wiggins (*Pedagogical Seminary*, xxxii: 414, 1925) and by results given in my own paper quoted

above.   Differences in fertility between persons of the same social class but of different intelligence are considerably more important than differences in fertility between persons of the same intelligence but of different social class.

May, 1945.

(b) POSTSCRIPT

This comment dealt with one point, the indirect estimate of the amount of the decline in test intelligence on the basis of the negative association between intelligence and family size.   In particular, I was anxious to show that Cattell's results and those of the Bath survey were actually in close agreement.

Reviewing the evidence after the lapse of four years and especially in the light of the results of the recent Scottish Survey (Scottish Council for Research in Education, " *The Trend of Scottish Intelligence* ", 1949) some modification, not of the estimate, but in emphasis, is necessary.   The repetition of the Scottish Survey shows a rise of mean group test score during 15 years and no change in terms of Binet I.Q.   I still think that the estimate is valid, but the anticipated fall has been cancelled by other factors.   It was stressed in the penultimate paragraph of the comment that in making the estimate no assumption was involved as to whether differences in intelligence were hereditary or environmental, and it may be that a substantial part of the association with fertility is conerned with the non-genetic components of variation.   It may also be that changes in methods of education have made the tests slightly easier for the new generation of children.   On either hypothesis the negative association between intelligence and fertility has not caused a fall, but has prevented a rise.   On the second hypothesis a true fall has been masked, but on the first hypothesis a part of the anticipated fall could be truly cancelled by social and educational improvements.   A third possibility is that some kind of compensatory mechanism has evolved, which tends to keep the population in equilibrium.   Finally, an overlapping of generations, such as exists in the parents of 11-year old children, combined with a falling-off of the association between intelligence and fertility, might lower considerably the actual amount of the estimated decline.

In the light of the Scottish Survey, fears of an immediate catastrophic fall in intelligence as measured, due to differential fertility, may be set aside. But it is clear that important problems remain, and it is highly desirable that they should be intensively studied.

September, 1949.

5.   MEMORANDUM BY DR. E. O. LEWIS

The evidence summarised in this Memorandum is based chiefly upon the findings of an investigation which I, with the assistance of several colleagues, made on behalf of the Departmental Committee appointed by the Board of Education and the Board of Control in 1925.   The investigation took four years ; the Committee published its report[1] in 1929.

This investigation was undertaken primarily to ascertain the incidence of mental deficiency in England and Wales.   What little evidence I am able to place before the Royal Commission relates to the qualitative rather than the quantitative aspect of the problem of population.   Since the trend in this country, as in many others, during the last half-century has been towards a smaller population it is important to ascertain what concomitant changes, if any, are taking place in the mental endowments of the population.

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[1] *Report of the Mental Deficiency Committee* (1929), H.M.S.O.

In the time at our disposal for this investigation it was not practicable to investigate the whole population of England and Wales. We restricted our enquiries to six areas each with a population of 100,000 approximately. Three of these areas were urban, two rural and the other partly urban, partly rural in character. The total population investigated was 623,000 ; this number constitutes about one-sixtieth of the whole population of England and Wales. Although the six areas investigated were fairly representative of the whole country, the fact that only one-sixtieth of the total population was comprised in our investigations renders it necessary to be cautious in making generalisations about the whole population of England and Wales from our findings.

The average incidence of mental deficiency in the six areas was found to be 8.57 per 1,000 population. On the basis of this figure we estimated that there were 314,000 mentally defective persons in England and Wales.

In 1906, the Royal Commission on the Care and Control of the Feeble-minded estimated on the basis of the findings of several medical investigators the total number of mental defectives in our country to be approximately 170,000. Undoubtedly the disparity between these two estimates is to be attributed largely to the fact that I and my colleagues were enabled to make a more thorough ascertainment than the medical investigators could possibly have made for the Royal Commission in the first decade of this century. After making every allowance for the different conditions in these two investigations, the Departmental Committee came to the conclusion that during the twenty-five years that had elapsed between the two investigations there had been some increase in the incidence of mental deficiency in this country.

The significance of this conclusion can only be grasped fully in the light of the modern scientific conception of the nature of mental deficiency, but it is impossible to elaborate this conception in detail in this memorandum. The feature of mental deficiency most relevant to our subject is that its incidence is an indication of the distribution of intelligence and mental endowment generally throughout the whole of that community. As the incidence even now is less than 1 per cent. of the population, the increase of mental deficiency that has occurred during this last generation cannot be said to present a serious social problem of itself. But it becomes a " danger " signal if it indicates that the level of intelligence throughout the country has fallen. It is conceivable that a decrease in the population may be desirable economically in some cases, but never if along with the decrease there is a general deterioration of the mental stature.

To some extent our own investigation enabled us to discover some of the factors that tend to lower the general level of intelligence of the native: but the chief credit for elucidating these factors is due to researches and surveys made subsequent to our investigation—more especially those in Bath, Colchester, Merseyside and Newcastle.

Undoubtedly one of the most important of these factors has been the relative fertility of various groups in the community during the last three of four generations. The birth rate in the families of professional persons and skilled workers has fallen much more than it has in the families of unskilled workmen. The fall has been most pronounced in those families that have made rapid progress socially in the course of the last two or three generations. Many of these families have progressed socially but regressed biologically—some to extinction.

During the last few decades, psychological tests have been applied extensively in several countries. The results in the main show that social and economic status is correlated with mental capacity. If this view is accepted

it is not surprising that the cumulative effect of this differential fertility should be a deterioration in the intelligence of the community as a whole. What is rather surprising, however, is that the effect has become manifest in such a comparatively short period of two or three generations. But this fact should raise our hopes and stimulate the nation to action, because if the present trend of differential fertility was reversed the mental calibre of the nation could be improved generally in a few generations.

One of the most definite findings of our investigation was that the incidence of mental defect was decidedly higher, approximately 50 per cent. in rural than in urban areas. This finding throws some interesting light upon what social changes may affect the quality of a population.

This disparity in the incidence of mental defect in town and country appears to be one of the by-products of the great and rapid trend towards urbanisation that began about a hundred years ago in this country and has not yet ceased. At the middle of the last century the total rural population of England and Wales exceeded that of the urban population ; at present the urban population is five times as large as the rural. It was but natural that the more intelligent and progressive members of the rural communities should be the first to appreciate the economic advantages offered by the industrial centres and therefore these members formed a large proportion of the migrating population. The cumulative result of this in many rural districts was to leave a residual population of poor mentality in these districts. In such communities it is inevitable that the incidence of mental defect should become high and that the mental endowments of the majority of the children should be below the average for the country as a whole. It is well to emphasise that whatever increase there has been in the incidence of mental deficiency has occurred mostly in rural districts and not in towns, and that it has been due to the operation of selective genetical factors and not to deleterious industrial conditions.

In parentheses, I may add that our findings give a denial to any sweeping generalisation that rusticity is synonymous with mental inferiority. The level of intelligence in some villages, judged by the results obtained with group tests given to the schoolchildren, compared very favourably with that of urban populations. In these rural districts it seems that the more intelligent members have resisted the attractions of the towns and that the less intelligent and efficient members have been forced to seek occupation elsewhere.

In each of the six areas we investigated we found that the mentally defective were very unevenly distributed. In the rural areas many small villages had several defectives whilst in others there were none. In the towns the large majority of defectives resided in slum areas. Our experience agrees with that of American investigators in this field of work, namely, that the mentally defective are to be found in small "pockets" which are unevenly distributed throughout the country.

A detailed study of some of these "pockets" enabled my colleagues and myself to appreciate the significance of mental deficiency as a social problem. We found that, with few exceptions, the other members of the families with mental defectives were persons with poor mental endowments. For every single mental defective there were usually three or more other members of the family who could be described as "dull". In a discussion on the quality of a population attention should be focused not so much upon the mentally defective, but on this much larger borderline group. From the genetic standpoint the marriage of the "dull" girl with the "dull" lad is the crux of the problem.

Our enquiries revealed also that in the families that constitute these " pockets " there is a high concentration of those individuals that give rise to chronic social problems. These families comprise a high proportion of the insane, epileptics, chronic sick and paupers, recidivists, casual labourers and unemployables, habitual slum dwellers, prostitutes and other social inefficients. This section of the community has been appropriately called " The Social Problem Group ".

Our knowledge of the relative part played by inherited and environmental factors in the production of such a complex group is very meagre. Even in the production of mental deficiency. Dr. Penrose's researches have revealed that in only 29 per cent. of cases can the condition be attributed solely to morbid inheritance, in 9 per cent. to environmental factors, and in the large majority of cases, 62 per cent., both heredity and environment play some part. Probably in the causation of some of the other evils associated with the " social problem " group environmental factors are still more important. But the point that needs to be emphasised in the discussion of the quality of population is that the fundamental handicap of the members of the social problem group is their poor mental endowment. Their economic and social inefficiency is due to the fact that they are greatly handicapped in competing with others, and their anti-social behaviour is often simply a natural reaction to their realisation of this fact. In envisaging future legislation for the increase and betterment of our population it would be inadvisable to ignore the existence of the " social problem " group.

January, 1945.

6. THE EFFECT OF THE DIFFERENTIAL BIRTHRATE ON INBORN MENTAL CHARACTERISTICS[1]

MEMORANDUM BY PROFESSOR SIR CYRIL BURT

The Argument

On the questions raised, the most reliable evidence available consists of data collected during surveys of school populations by means of tests of intelligence. By intelligence is meant inborn, general, intellectual ability. During the past forty years work with standardized tests has conclusively established (i) that a general factor underlying all forms of mental efficiency may plausibly be assumed, (ii) that this factor can be assessed with reasonable accuracy by both group and individual testing, (iii) that the differences in intelligence as thus defined and measured are due largely to the individual's inherited constitution.

So far as the evidence goes, (*a*) it seems almost certain that there is in this country a negative correlation between innate intelligence and size of family, and that the size of the correlation (about -0.20) is large enough to demand urgent practical attention ; (*b*) it seems highly probable that the average level of intelligence among the general population may be declining at a rate which might produce serious cumulative effects if at all sustained ; (*c*) finally, it seems more probable than not that, with characteristics other than intelligence (e.g., temperamental or moral qualities such as relative freedom from neurotic or delinquent tendencies, and physical characteristics such as health and strength), the effects of the differential birth rate are smaller, but, if anything, unfavourable rather than favourable.

The evidence, however, is by no means conclusive. In psychology methods of measurement are subject to so many disturbing factors that the empirical verification or disproof of such inferences is a far more difficult matter than

[1] This memorandum has, with permission, been published as a pamphlet by the Eugenics Society and Hamish Hamilton Medical Books. (London, 1946.)

in the less complex sciences. Even as regards intelligence, there is as yet little direct confirmation irrefutably demonstrating an actual decline. And our theoretical knowledge of the inheritance of human mental characteristics is at present far too meagre for indirect deductions to be completely trusted.

The calculated figures suggest a drop of nearly 2.0 I.Q. points per generation (that is, expressed in terms of mental age, about a third of one year's mental development). On the other hand, a comparison of the actual figures for recent years with figures obtained a generation ago reveals changes in the number of the bright or the dull children decidedly smaller than this rate of decline would imply. Thus, while both lines of evidence suggest the existence of a decline, they differ in the amount indicated.

The figures obtained in different parts of the country by different investigators show a striking agreement. Yet, for the reasons given, the only conclusions which, I believe, every psychologist would accept as beyond all reasonable doubt are the following: (1) there is an overwhelming case for a carefully planned inquiry on a large and systematic scale to test the inferences set out above; (2) the inquiries already carried out show that the psychological and statistical techniques are now sufficiently developed to make a full-scale inquiry well worth while, provided it is planned and carried out by investigators adequately trained.

(1)

Early Investigations on Selected Groups

The earliest systematic inquiries on the inheritance of mental characteristics in the general population were those undertaken by Karl Pearson and his fellow-workers, largely under the inspiration of Sir Francis Galton. These were of great value in demonstrating the need to substitute a scientific procedure for casual observation and subjective impression. But they were still largely vitiated, as has often been pointed out, by reliance on impressionistic ratings of popularly conceived intellectual and moral qualities. Galton, indeed, had suggested the possibility of inventing psychological tests; but his suggestions were mainly confined to tests requiring simple sensory discrimination or speed of reaction.[1]

1. At Oxford

The first attempt to attack the problem by means of formal tests of well-defined psychological characteristics was, I believe, a research[2] carried out at Oxford by J. C. Flugel and myself in 1907 at the suggestion of William McDougall.[3] Galton's proposal for an anthropometric survey of the whole country, including mental as well as physical characteristics, was then very much to the fore. My own view was that, so far as intellectual characteristics were concerned, the easiest plan would be to begin with surveys of the child population in the schools. Accordingly, the primary aim of the Oxford experiment was to discover a set of psychological tests, sufficiently reliable and sufficiently practicable for inclusion in such surveys. The first set of tests were tests of cognitive (i.e., simple intellectual and practical) capacities; and ranged from the lowest and most elementary sensory and motor capacities up to more complex processes on higher mental levels, such as memory, attention, reasoning, and the like.

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[1] Cf. J. C. Flugel, *A Hundred Years of Psychology*, pp. 126–33.
[2] Burt, C., " Experimental Tests of General Intelligence ", *Brit. J. of Psychol.*, iii, 1909, pp. 94–178, and other papers.
[3] Cf. McDougall, W., " Psychology in the Service of Eugenics ", *Eugenics Review*, vi, 1914. Cf. also *id.*, *National Welfare and National Decay* (Methuen, 1921).

One of Karl Pearson's fellow-workers, David Heron,([1]) had recently published considerable evidence indicating that the birth rate differed widely with differences of social level, that of the professional classes being less than half that of the so-called working classes. It was therefore arranged that two groups of children, representing these two contrasted social classes, should be examined. Complete age-groups (12.0-13.0 years) were chosen (i) from a well-known preparatory school (the Dragon School), where the pupils were sons of men eminent in the intellectual professions (bishops, professors, scientists, civil servants, etc.), and (ii) from an elementary school, where the parents were local tradespeople and working men, not so ill-paid, however, as to lead to serious handicaps from poverty or poor health.

Every child was tested individually ; and each test was applied twice by two independent investigators (Flugel and myself : the coefficient of agreement averaged about 0.8). In our first inquiry, owing to the large number of tests included, only small groups could be examined—30 boys at the elementary school, and 13 at the preparatory. In spite of the small numbers, the essential differences were significant. It was argued that " the tests chosen do not involve to any appreciable degree acquired skill or knowledge : they consist of simple mental tasks unlike anything the children had ever previously practised. Hence there is reason to believe that the differences revealed are mainly innate ". With two minor exceptions (the two lower senses, touch and weight) the average performances of the preparatory boys were in all cases superior to those of the elementary boys, indeed, in most cases superior even to those of the best elementary boys.

Moreover, the class-difference was greatest in those tests which appeared to be most highly correlated with " intelligence ". A detailed analysis of the results led to the final conclusion that " at least one mental character of the highest ' civic worth ', namely, intelligence, can be reliably measured and appears to be inherited ". Supplementary investigations, which included similar studies with mentally defective children attending special schools, appeared to strengthen these inferences, and " to support the growing apprehension that the elimination of unfit stocks is being gradually suspended, and that the dull and defective are multiplying more rapidly than the bright ".([2])

Conclusions. The following conclusions were drawn from these early investigations : (i) As Galton, Binet, Spearman, and others had maintained, and contrary to the view then held by Thorndike and his followers, it is perfectly legitimate to speak of a " general ability " entering into all intellectual functions. (ii) This " general ability " can best be assessed, not by impressionistic ratings (Pearson and others), nor by a test of simple sensory discrimination (Galton and Spearman), but by a combination of tests involving higher and more complex mental functions. (iii) " General ability " as thus assessed appears to be largely inheritable and therefore innate. This led

([1]) Heron, D., *The Relation of Fertility in Man to Social Status* (1906). In an analysis of birth rates for London boroughs Heron showed that the correlation of high birth rate with lower social class had almost doubled between 1851 and 1901. The relation emerged still more clearly in later analyses of the data obtained in the census of 1911 and of 1921 : for the educational implications, cf. E. J. G. Bradford, " Can Present Scholastic Standards be Maintained?", *Forum of Education*, iii, 1925, pp. 186 f. Pearson and his collaborators found no correlation between fertility (size of family) and intelligence (Pearson, K., and Moule, M., *Ann. Eug.*, i, 1925) ; their data, however, were obtained from a somewhat selected population, viz. pupils attending the Jews' Free School, Aldgate : the assessments for intelligence were merely ratings allotted according to the biometric laboratory's scale.

([2]) The experiment was repeated at Oxford a few years later by another of McDougall's pupils, with slightly different tests but with the same essential result (cf. H. B. English, " Mental Capacity of Schoolchildren correlated with Social Status ", *Yale Psychological Studies*, 1917).

to the definition of " intelligence " as " innate general intellectual efficiency " (I now prefer to substitute " cognitive " for " intellectual ", since " intellectual " may suggest that " practical " efficiency is excluded).   (iv) The average general ability is higher in children of the professional classes than in children of the working classes, though the differences between individuals appear far greater than the differences between classes.   (v) If intelligence is innate, then the declining fertility of the less intelligent must raise a serious social problem.

2. *At Liverpool*

In order to apply test methods to larger numbers, Mr. R. C. Moore and I carried out experiments with " group tests ": these are tests based on roneoed or printed question-sheets, similar to the examination papers commonly set by teachers and others in testing ordinary school knowledge : they differ (i) by depending as little as possible on differences in acquired knowledge or skill ; (ii) by including 50 to 100 short questions instead of a small number of long questions ; (iii) by requiring the children to answer with single words only, or simply to underline alternative answers ; (iv) in later versions, by presenting the problems in non-verbal form.   It was found that for higher mental processes, particularly general intelligence, and with older pupils, the group method of testing was nearly if not quite as reliable as individual testing.   Further, unlike the tests involving special apparatus, they could be applied and marked by any teacher with experience in the ordinary technique of school examination.[1]   With these newer tests, limited primarily to the assessment of " general intelligence ", investigations on a more extensive scale were carried out at Liverpool and in one or two rural areas.   In all these inquiries much the same class-differences invariably appeared ; and increasing evidence was obtained for considering general intelligence, as thus measured, to be largely if not mainly innate.   At the same time, no appreciable differences could be discovered in innate general intelligence, as distinct from acquired attainments and certain special capacities, between the two sexes.[2]

The following correlations were obtained : intelligence of parents and of children, 0.34, of sibs, 0.48, intelligence of children and social class, 0.31, intelligence of children and number in family, −0.23.   At that date, however, little was known about the distribution of intelligence in the general population.   Hence the selection of samples could not be properly controlled ; and probably tended slightly to magnify the apparent size of the correlation coefficients.   Nevertheless, subsequent work[3] both in this country and America would seem on the whole to have confirmed these early estimates.

In a supplementary inquiry, attempts were made to assess other intellectual, practical, emotional and moral qualities.   The chief conclusions were : (i) that surveys of such qualities were of less importance theoretically and difficult to carry out in practice, and (ii) that emotional and moral qualities were far more amenable to environmental influences than intellectual capacity. It was therefore argued that " a community, which allowed low grades of

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[1] Burt, C., "Tests of Higher Mental Processes and their Relation to General Intelligence" *J. Exp. Ped.*, i, 1911, pp. 93–112.

[2] Burt, C., and Moore, R. C., *J. Exp. Ped.*, i. pp. 273 f.

[3] The chief investigations carried out in this country are cited below.   In America, the inverse correlation between fertility and intelligence would seem to be, if anything, larger than in this country.   The more important American investigations are reported in Yoakum and Yerkes, *Mental Tests in the American Army*, 1920, pp. 198 f.;   Haggerty and Nash, *J. Educ. Psych.*, xv, 1924, pp. 559 f.;   Sandiford, *School and Society*, xxiii, 1926, pp. 117 f.; Phillips, " Success and the Birth rate ", *Harvard Graduates Mag.* (1927), xxxv, pp. 566 f.; Huntington and Whitney, *Builders of America* (1927);   Freeman, Burks, *et al.*, *27th Yearbook*, 1928.

intelligence to multiply and then tried to train them, and which neglected the training of emotional and moral qualities, was pursuing an extremely unwise policy ".[1]   The eugenic corollaries which apparently followed from these various results were discussed in a paper read before the Eugenics Society and in two or three semi-popular articles published in the *Eugenics Review* and elsewhere[2] ; but at that date the entire hypothesis of a " general factor " of intelligence came under sharp criticism from Dr. William Brown and Prof. Godfrey Thomson in this country and from Prof. E. L. Thorndike in America.[3]

(2)
Later Investigations on Unselected Groups

From 1913 to 1932, as Psychologist to the London County Council, I was able to make far more extensive investigations bearing upon this problem, in the course of my regular work in the elementary and secondary schools of the County.   Among the official duties of the psychologist, the following were given first place : (i) to devise and apply tests of innate ability for selecting mentally deficient children for special schools—tests, that is, which should not be affected by home or school handicaps, and should thus avoid the injustice often done when such cases were selected solely by the impressionistic judgments of teachers or school doctors ; (ii) to devise and apply tests of innate ability for selecting scholarship children—tests once again which, unlike the ordinary examinations in English and arithmetic, should not be influenced by the superior home or school facilities of better-off families ; (iii) to determine from time to time whether the average level of educational attainment throughout the Council's schools was improving or declining owing to change in teaching-methods or other causes.[4]

In pursuance of these aims, part of the general plan of work was to carry out, at convenient intervals and with the aid of teachers, care committee workers, and others, (i) broad surveys of London schools as a whole, (ii) more detailed surveys of the schools in a single representative borough, and (iii) still more specialized studies of particular groups—the mentally defective, the dull and backward, the super-normal, the neurotic, and the delinquent—side by side with control-groups of normal pupils.   In the most thorough of these surveys an endeavour was made to obtain as complete a picture as possible for the school population of a typical borough.   The device of " representative sampling " was adopted ; and 3,510 children were tested with an English adaptation of the Binet-Simon scale.   Later surveys were carried out in the same area with a revision of the Terman version ; and, since the majority of the tests in the two versions were identical, an exact comparison could be made.   So far as possible, doubtful cases were checked by perceptual tests (usually the Porteus mazes, the London version of the Pintner-Paterson performance tests, or non-verbal forms of the analogy, completion, and classification tests).

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[1] It may be remembered that at this date the aim of the special m. d. school was to improve the feeble-minded children, so that they could be de-certified; and little or no systematic effort was made at treating juvenile delinquents or (outside the public schools and a few older grammar schools) at any kind of character-training.

[2] E.g. Burt, C., "The Inheritance of Mental Characteristics ", *Eugenics Review*, iv (1912), pp. 1–33; " The Experimental Study of Intelligence ", *Child Study*, iv (1911), pp. 14–44; v (1912), pp. 1–33.   Cf. also Edgar Schuster, *Eugenics* (Collins, 1912), pp. 153, 219 *et seq.*

[3] Cf. Brown, W., and Thomson, G., *Essentials of Mental Measurement*, Chap. IX, Sect. 3 and refs.   In view of the opinions now held by all three critics, we may, I think, take it that their criticisms were directed, not so much against the theory itself, as against the weakness of the evidence then available.

[4] Cf. L.C.C., *Annual Report of the Psychologist*, 1915.

Distribution of Intelligence among the General Population

The earliest of these surveys showed conclusively that variability in intellectual and educational characteristics " appears to be of much the same order as physical variability "[1] ; and this was amply confirmed by later inquiries.   Like the distribution of stature, the distribution both of educational attainments and of innate intelligence was found to conform, at least to a first approximation, with the so-called normal curve.   And like the standard deviation for stature and weight, the standard deviation for intelligence proved to be, at the middle of the school career (age 10), roughly equivalent to about $1\frac{1}{2}$ years' growth.   On the other hand, the standard deviation for attainments was equivalent to only one year's progress at the age of 10.   Thus education tends to diminish, not (as is sometimes argued) to increase, the variability revealed by intelligence tests.[2]

Three features of these distributions deserve emphasis: (i) The range of intelligence appeared far wider than had previously been supposed: thus, with a typical sample of 100, the mental ages of elementary schoolchildren aged 10 by the calendar range from about 6 years up to nearly 14 years, and show a standard deviation of about 15 points on the I.Q. scale. (ii) Between the lowest type of mental defective and the highest type of intellectual genius the gradations are continuous: there is apparently no gap or gulf ; in a sufficiently large sample every intervening grade of intelligence will be represented.   (iii) So far as innate intelligence is concerned, the average level of the adult population is not much higher than that of an average child of 14.

It is important to note that the form (especially the symmetry), as well as the standard deviation, of the distributions may be appreciably affected (a) by exclusion or inclusion of children not attending ordinary elementary schools, and (b) by the particular test-scale employed, especially by the unit of measurement.   A larger standard deviation is furnished by newer test-scales, as contrasted with the old, and by group tests as contrasted with individual tests.

To obtain a satisfactory picture of the distribution of intelligence among adults is not so easy.   After the war of 1914-18, I was asked by the Civil Service Commission to carry out tests of intelligence on ex-service candidates ;

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[1] L.C.C. Report No. 1868 (1917), p. 86.

[2] L.C.C. Report No. 2052 on *Mental and Scholastic Tests*, 1921, p. 176, and Fig. 24 facing p. 162 (based on 3,600 children).   Cf. also L.C.C. Report No. 1868, on *The Distribution and Relation of Educational Abilities*, 1917, Fig. 6 facing p. 33.   The sizes of the school samples were large enough to show that the distribution departed significantly, though not considerably, from perfect normality.   In fact, the curve found was rather like that which would be expected if we supposed that the distribution of intelligence is determined, not by an indefinitely large number of indefinitely small causes, but by a large but definite number of dominant and recessive genes.   However, much of the amount and direction of the skewness is, in my view, likely to be an effect mainly of the mode of measurement: if, as in the early Binet scale, the upper end of the scale is limited, the skewness is likely to be negative; if it is unlimited, the skewness is likely to be positive, (a) because a child of 8 cannot deviate more than 8 years *below* the average, whereas he may quite possibly deviate more than 8 years *above* the average, and (b) because the intervals between age-norms above 12 or 13 are apt to be compressed, owing to the retardation of mental growth.

Most psychologists have accepted the view that intelligence is distributed normally.   E.g. Terman about the same time published data indicating that the distribution of intelligence quotients obtained with his version of the Binet tests in America approximated to the normal curve, though no statistical test of normality was actually applied (*The Intelligence of Schoolchildren*, 1921, pp. 34, 50, 78).   He suggested that the standard deviation with his revision was about 13 points, but later seems to accept 15 points (*Genetics of Genius*, iii, p. 29).   A fuller examination of the normality of the distribution is to be found in Thorndike, *The Measurement of Intelligence*, 1928, Chap. viii: he reaches much the same conclusions, " a very little positive skewness, increasing year by year; and a slight swelling of the lower tail, due to pathological cases of mental deficiency ".

and I then found that the distribution of intelligence among over 3,000 adults agreed, both in form and in general range, with that already observed among schoolchildren.[1]   More recently, as a member of the War Office Advisory Committee on Personnel Selection, I have had occasion to analyse much of the material collected during the recent war from psychological tests used in the fighting services.   Here, too, much the same conclusions appear to emerge.   However, for publishable evidence from this source it will be necessary to await the release of official reports on the statistical results.

Distribution of Intelligence according to Occupational Class

From time to time an endeavour was made to assess the average intelligence of children and adults classified according to occupations.   The table[2] below gives the most recent results as being the most reliable.

The correlation between children's intelligence and economic status amounts to 0.32.   Other investigators,[3] both in this country and in America, have reached a figure of much the same order.   The only exceptions of importance are the correlations reported by Raymond Cattell, who gives figures of 0.89 and 0.92.

TABLE I

Intelligence of Parents and Children classified according to Occupations

	Occupational Category	Average Intelligence Quotient	
		Children	Adults
Class I ...	Higher professional: Administrative ...	120·3	153·2
Class II ...	Lower professional: Technical executive ...	114·6	132·4
Class III ...	Highly skilled: Clerical	109·7	117·1
Class IV ...	Skilled	104·5	108·6
Class V ...	Semi-skilled	98·2	97·5
Class VI ...	Unskilled	92·0	86·8
Class VII ...	Casual...	89·1	81·6
Class VIII ...	Institutional	67·2	57·3

[1] *Ann. Rep. Brit. Ass. Adv. Sci.* (1923), Section J (Psychology Pres. Add.) pp. 215 f.

[2] Taken from " Ability and Income ", *Brit. J. Educ. Psychol.*, Vol. xiii, 1943, p. 84.   The data for children refer to pupils attending London schools only.   The data for adults were largely obtained during investigations carried out for the National Institute of Industrial Psychology: cf. Burt, *et al.*, " *A Study in Vocational Guidance* " (Medical Research Council Report No. 33), H.M. Stationery Office, 1926.

[3] For a brief summary cf. *Brit. J. Educ. Psych.*, *loc. cit.*, p. 84.   It has been alleged that, since the psychologist is himself a member of the professional class, he will naturally wish to demonstrate by his tests that his own class is superior in intelligence, and hence that the very tests he invents will be biased by his own class-notion of what intelligence is.   With regard to the interpretations of intelligence, I may refer to the appendix, where it will be seen that the psychologist understands by this word a factor defined technically and objectively by the results of his work.   In reply to the alleged unfairness in the academic or verbal bias of the tests, it may be emphasized that precisely the same conclusions are reached with non-verbal tests of a practical, mechanical, or performance type.   So far from favouring children from the professional or better-off classes, the inclusion of a psychologist among the examiners for junior county scholarships almost invariably increases the proportion of scholarship winners coming from the poorer or the working classes.   May I quote from a book by one of the most eminent of educational psychologists?   " When I was 13 years of age and finishing an elementary school education, I won a scholarship to a secondary school. . . . I have ever since been greatly impressed by the influence that event had on my life; and have spent a great deal of time in endeavouring to improve the methods of selecting pupils at that stage."   The vast majority of the psychologists now working in the educational field could, I fancy, echo that statement.

A correlation of only 0.32 implies a large amount of overlapping between the various social classes. As was stated in my report, " the average intelligence of different social groups certainly differs, but the difference between the averages is far smaller than the difference between the individuals ". The group-differences shown in the table may therefore be a little misleading unless we bear in mind what has already been said about the wide range of individual ability. Children from the " higher professional class " include individuals from every one of the six intelligence-grades set out below (Table III), including the feeble-minded. Similarly, children from the " unskilled " and " casual " classes include central school pupils and even scholarship winners: indeed, owing to their greater numbers the humbler social classes produce far more pupils of genuine scholarship ability than do either or both of the professional classes.

During the last 30 years, the correlation between economic status and children's intelligence has, if anything, slightly increased. It would seem that the effect of educational and vocational guidance has been rather to enhance the tendency to a class-segregation according to intelligence. An exceptionally bright boy of working-class parents may now be fairly sure of a scholarship to a secondary school and university ; and, with or without the assistance of a vocational psychologist, he is likely to be in effect removed from the working class and transferred to the professional class.[1]

(3)

Relation between Intelligence and Size of Family

In the borough chosen as fairly typical of conditions in London as a whole, and made the subject of a more intensive survey, details were regularly obtained in regard to size of family (among other items). For these we relied mainly on the statements of the children themselves: but, where it seemed desirable, the data were checked so far as possible by the teachers or the organiser of children's care. At the poorest school in the borough, the average number of children in the family was 5.2 ; at the best school only 2.9. The average intelligence quotients were 98 and 113 respectively. Thus the children from the poorest social classes not only have an intelligence that is nearly two years below that of the children from the better social classes, but are drawn from families that are nearly twice as large.[2] Similar tendencies appear if we contrast the exceptionally bright with the exceptionally dull: for example, as stated in my report, " the average number of children in families containing at least one backward child is 4.6 ; in families containing at least one scholarship winner it is 3.2 . . . Seventeen per cent. of the scholarship winners are only children ; but only 8 per cent. of the dull and backward ". For the ordinary elementary school population taken as a whole, " the correlation between the intelligence of a child and the size of the family to which he belongs is − 0.19 ; the correlation between educational attainments and size of family is − 0.22 ". If, in

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[1] Since the last war, there have been some slight signs of a reaction against these ambitions. The words of one working-class father indicate the views of a good many: " I would rather see my boy stop on at the elementary school and be top of his class than go to the secondary school and drop to the middle of his form; if he has brains, I would rather see him leader among those of his own set than a nobody among a group of bank clerks or teachers."

[2] Cf. *L.C.C. Report No. 2052* (1921), pp. 190–1. I may add that very much the same facts were noted in a survey which I was asked to carry out for the Birmingham Education Authority. (*Report of an Investigation on Backward Children*, City of Birmingham Stationery Department, 1920, pp. 15 f.) and an informal study in several Warwickshire villages.

addition, a due proportion of children from special m.d. schools and from secondary and other schools of a higher type are included, the correlation between intelligence and size of family rises to -0.24.

But in considering surveys carried out by testing children at school we have to bear in mind two limitations. First, many of the families must be still incomplete at the time of the survey. Moreover, on an average, the parents of the brighter children are somewhat older ; hence their families are more likely to be complete, while the families that include the duller children may still go on increasing. Secondly, unmarried and childless adults are of necessity unrepresented ; and these include a disproportionate number of persons whose intelligence is above the average level. If due allowance be made for both these limitations, then the final figure for the correlation would be higher still. It may be added that, although the frequency distribution for family-size is asymmetrical, the regressions (except where the lowest defectives are concerned) appear to be remarkably steady and linear (they imply an increase of nearly $\frac{1}{2}$ a child for a decrease of 1 S.D. in the intelligence scale, or about 1.4 I.Q. decrease for the increase of 1 child in the family). Thus the restrict or non-restriction of births is not a phenomenon peculiar to one social class or one intellectual level.

Several social writers, however, have argued that, since (as I pointed out) " the difference between average intelligence of the social class is far smaller than the difference between individuals within the same social group ", it is quite possible that the inverse correlation between size of family and intelligence may after all be due simply to differences of reproductivity between the different social classes, and not associated with differences of intelligence as such (indeed, within the higher professional class some writers have actually reported a positive correlation between reproductivity and intelligence). But any generalisation of this kind seems fully refuted by two lines of evidence. First, we can calculate the correlations obtaining within schools where the pupils are all recruited from a fairly homogeneous social and occupational class. We find that the correlations are still significant, ranging from -0.11 to -0.18. This is so even in the poorer areas. The conclusion to be stressed, therefore, is not so much that the smaller, well-to-do or professional classes are producing few children, but that among the far more numerous working classes it is still the most intelligent families who contribute fewest to the next generation. Secondly, we may verify this inference on a wider scale by the device of " partial correlation ". Taking a conservative estimate for the correlation between family-size and intelligence, viz. -0.19, and an average estimate for the correlation between the family-size and occupational class, viz. -0.21, then, within a group of the same occupational level, the partial correlation between family-size and intelligence is still -0.14—a fully significant figure and probably an underestimate.

At present, no doubt, social class, which so largely determines the aims of the parent for his child, may be a factor almost as important as intelligence —except perhaps in the highest intellectual group of all : it is when the bright child from the poorer classes has won his way to a high social stratum, and has himself turned into a parent, that the desire to limit family-size becomes so marked ; he himself perhaps was one of five or six children, but he produces only two or three. Nevertheless, with the rise in the standard of living and pleasure throughout the whole community, the class correlation will, I feel sure, grow smaller ; and the partial correlation with intelligence will soon outweigh the partial correlation with occupational category or

economic group. It has been perhaps a little unfortunate that the correlation with class, being the easiest to determine, came so early into the picture, and thus side-tracked the argument. Social origin and economic level, as such, may soon prove wholly irrelevant to the argument,

(4)

Geographical Distribution of Intelligence and Family Size

The correlations just cited were obtained in the course of a detailed survey of one large, typical borough. When we turn to London as a whole, a somewhat different line of approach suggests itself. Instead of procuring figures giving the intelligence and the size of family for individual pupils, we may obtain them for the constituent districts. In several of my earlier reports, maps were drawn up showing the incidence of backwardness, mental deficiency, and scholarship ability, and related social conditions (such as birth rate, size of family, and average economic level) for each of the electoral areas into which the county is divided.[1] These reveal, in graphic form, much the same correspondences as we have already noted for one particular district. Calculated by boroughs, the correlation between average size of family and percentage of backward and mentally defective pupils was found to be 0.35, and the correlation between average size of family and percentage of junior county scholarships – 0.21. By themselves, of course, such figures could not prove that the sole or even the chief cause of the variations were differences in innate mental characteristics ; but they do imply that the correlations observed in the borough, which was more intensively surveyed, also hold good throughout the county as a whole.

(5)

Estimating the Amount of Apparent Decline

Nevertheless, as was emphasised in my report, " some caution must be observed in drawing deductions from all these figures ". Certainly, with the correlations in front of us, it might seem " almost impossible to avoid the conclusion that, owing to differential fertility, the average level of intelligence throughout the whole community has already begun to decline ". Yet, when we seek to estimate the amount or rate of that decline, we are met by unexpected difficulties. All the methods of estimation agree in suggesting *some* degree of decline ; but they differ appreciably in the amount indicated. In the absence of systematic inquiries on a precise and extensive scale, our only course must be the rather tedious process of comparing all the main lines of evidence, and noting the upper and the lower limits to which their joint results appear to point.

There are two principal ways in which we may attempt to assess for a given community the rate at which its average inheritable intelligence is changing—an indirect and a direct. (1) Given the average I.Q. for families of different sizes (or the differential fertilities for families of different I.Q.'s) we may attempt to predict the I.Q. level of one generation as compared with that of another. (2) Assuming the composition of the community to have been stable over an interval of time (or making due allowance for changes in apparent composition) we may measure the average I.Q. level at the

[1] *Psychologist's Report on Junior County Scholarship Examinations* (1924). The map giving the distribution of backwardness was reprinted in *The Backward Child*, p. 97, and the corresponding table of educational and social statistics (with correlations) on pp. 100–1. As stated in the footnote (p. 99), the local distribution of the figures changed comparatively little between 1913 and 1932, but the correlations tended very slightly to diminish. Cf. also the map and table published in *The Young Delinquent*, pp. 73 and 77.

beginning and the end of the interval by two separate surveys. In practice, both methods of approach are attended with numerous difficulties that may introduce considerable error. I shall consider first the results of investigations carried out in London, and then, more briefly, those obtained in other parts of the country.

The following estimates are based on figures secured by both procedures from L.C.C. schools (special, ordinary elementary, and secondary) for the same borough as before. Since the I.Q. varies considerably according to the type of test used, I have adopted the practice of expressing all figures in terms of a standard scale: the best scale for this purpose would seem to be the London Revision of the Stanford-Binet tests.[1]

(1) *Indirect Estimation.* (a) With only a single generation available for testing, the natural procedure is to count up the number of families having 1, 2, 3, . . . children, and determine the average intelligence for each type of family. We can then calculate (i) what would be the average mental age (or intelligence quotient), if every family were of the same size, (ii) what is the actual average mental age (or intelligence quotient) with each family weighted according to its size. By this method we estimated that, for the borough in question, and during a single generation, there would be a drop of 2 mental months at the age of 10.0-11.0, or of about 1.8 points on the I.Q. scale (the figure is raised to about 1.9 points if an allowance is made for married and unmarried adults of parental age having no children).

However, when working in the schools instead of making a house-to-house survey, the figures obtained for the size of each family, and the frequency of each size, particularly in the case of the largest families of all, are apt to be somewhat untrustworthy. Hence it seemed desirable to check this estimate by an alternative method, working with average figures for family size. Though less accurate in theory, this procedure is probably more accurate in practice.

(b) For this complementary approach we require to estimate both (i) the proportionate number of children, and (ii) the proportionate number of families, having a mental age or I.Q. of a given level. Compressing the results into a table with wide intervals, we obtain the following figures:—

TABLE II

Distribution of School Population over the I.Q. Scale

Approximate Type	I.Q.	Proportionate No. of Children	Average No. per Family	Proportionate No. of Families
1. Scholarship	over 130	1·8	2·3	2·7
2. Central School	115–130	12·2	2·7	15·3
3. Good average	100–115	35·1	3·3	36·0
4. Poor average	85–100	37·5	3·6	35·3
5. Dull and backward	70–85	11·9	4·2	9·6
6. Feebleminded	under 70	1·5	4·7	1·1
Total ...		100·0		100·0

[1] This is the scale most frequently used by educational psychologists and child guidance clinics in this country. It was also adopted in the surveys carried out by the Joint Committee on Mental Deficiency (a description will be found appended to the Committee's *Report*, 1929, Pt. II, pp. 218–20). Owing to the limitations of the Binet scale towards the upper end, the higher mental ages are artificial norms based on group-tests, the size of the yearly intervals being determined by extrapolation. With this extended scale the standard deviation for the complete London population would appear to be rather over 15 I.Q.—about 16 for the upper half and rather less for the lower. Within the L.C.C. schools only, the standard deviations are reduced by the omission of ineducable imbeciles and idiots at one end, and at the other end of bright fee-paying pupils attending private or public schools. These omissions reduce the standard deviation to 14·5 —14·8 I.Q. for the upper half and 14·2 for the lower.

The table may be interpreted as follows. Out of (say) 1,000 ten-year-olds the number having an I.Q. between 115 and 130 is 122; the number having an I.Q. between 70 and 85 is almost exactly the same, viz., 119. But in the former group the average size of the family is only 2.7, whereas in the latter it is 4.2. Therefore the latter must have been drawn from a far smaller number of families and so from a far smaller number of parents. In fact, with certain simplifying assumptions, we can infer that the actual number of families must be proportionate to $122 \div 2.7$ and $119 \div 4.2$, that is, to 45.2 and 28.3 respectively. Adding the figures obtained in this way, we reach a total of 295.1 families (this may be roughly thought of as the number of married couples in the previous generation required to produce the 1,000 children in the filial generation with which we are now concerned—though that interpretation cannot be pressed too strictly). Accordingly, to translate the proportions into percentages we must divide each figure by this total and then multiply by 100. Thus the proportionate number of families in the two I.Q. groups mentioned must be

$$45 \cdot 2 \times \frac{100 \cdot 0}{295 \cdot 1} = 15 \cdot 3 \text{ per cent.}$$

and

$$28 \cdot 3 \times \frac{100 \cdot 0}{295 \cdot 1} = 9 \cdot 6 \text{ per cent.}$$

Similarly for the rest of the figures in the table.[1]

Now, if we calculate the average I.Q. for the whole group of children from the first column of percentages, we shall find that the general level of intelligence is 100.0 I.Q.: this figure follows of necessity if the entire group was a fair sample of the population on whom the tests had actually been standardized. But now let us suppose that the families in the area, instead of varying in size from 2.3 to 4.7 according to intellectual level, had each averaged precisely the same number in every one of the six groups. Then the average I.Q. (calculated now from the last column of percentages instead of from the first) would have been 101.9 instead of 100.0. Since the latter is the figure actually found, we are plainly faced with a drop or loss of 1.9 points on the I.Q. scale.[2]

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[1] Actually the absolute numbers of children and of families were obtained first and the percentages and averages derived from these.

[2] Most investigators have sought to deduce the average intelligence of the previous generation from the data obtained from the child-generation that is actually tested. That means that the intelligence of each parent (or mid-parent) must first be estimated from the data in the sample. There are (as implied above) two ways of doing this. We may either (a) calculate the average I.Q. of each family, or (b) calculate the average size of each family grouped according to the I.Q. level of the children: the former seems the more appropriate. A critic, however, will object that such deductions must surely be somewhat precarious, since after all, we have tested no members of the parent-generation. For instance, in assuming (as some investigators have done) that the intelligence of the mid-parent in a given group is identical with that of the children in that group we ignore the fact of regression. To my mind the simplest reply is this. What we are here primarily calculating is the *loss* of I.Q. resulting from unequal fertility; what we are contrasting is the actual level and the possible level of the same generation, not the actual levels of two different generatons.

Moreover, as noted in my original report, there is a further reason why it may be rather rash to deduce the relative intelligence of the parents from that of the children tested. There would seem to be a negative correlation between intelligence and order of birth. With my own cases it amounts to only $-0 \cdot 12$; it appears to vary considerably in different social classes, and to have diminished during the last 25 years. Nor is it altogether simple or linear: on the average, the brightest children are apparently, not the first-born, but the second; the third and fourth have slightly lower I.Q.'s, after which the decline is more marked: the best-established instances are those of Mongolian defectives, who often appear at the tail of a rather large family. Since we are testing fairly young children, it would follow that, whenever we are dealing with members of a large family, we must usually be testing those who are late in order of birth; and (if the foregoing evidence is accepted) these will be the duller representatives of the family. However, so far as my data go, the differences associated with order of birth are decidedly small—only a fraction of an I.Q. Hence it may be doubted whether any serious errors have arisen from the fact that this point has been so often overlooked.

Once again, allowance should be made for the facts that many adults have remained childless, and that many of the families, particularly in the lower grades, were doubtless not complete at the time of the survey. Such allowances would increase the estimate by several decimal points. On the other hand, in spite of the care taken in constructing the tests and in re-examining doubtful cases, it would certainly be unfair to attribute the whole of the difference thus revealed to differences in innate or hereditary constitution (see Appendix) ; and a due allowance for this defect would probably knock off the decimal points we have just added. In fact, after giving full weight to both these opposing factors, we should, I think, eventually conclude that, when based on the foregoing figures, the most plausible estimate would still be in the neighbourhood of about 1.9 I.Q.

(2) *Direct Estimation.*—Now experience shows that, where many of the factors are obscure or unknown, it is always wise to secure direct confirmation, so far as possible, for any conclusion indirectly deduced. And an educational psychologist, familiar with the watchfulness of teachers, would expect that, if a decline of this size had been going on for at least a generation, many of the older head-teachers and officials would assuredly have noticed some of the incidental effects—a decrease in scholarship ability or an increase in the dull and mentally defective. Further, in those areas where the same schools have been re-tested after an appreciable interval, there should be discernible indications of the change in the test-results. We might expect this more direct method to yield a larger figure than the more indirect ; for the results of the later survey would include the effects of the childlessness of so many superior adults. At the same time, we must remember that the probable error of the assessments is bound to be high : for example, even if complete samples of 4,000 children could be tested on two separate occasions, the probable error of the difference between the two means could hardly be less than 0.25 I.Q.

Between 1913 and 1939 I endeavoured to assess the average level and variability of the London school population on three occasions—namely, when standardizing, first the original Binet scale, secondly the Stanford revision, and thirdly the more recent version by Terman and Merrill. The third inquiry was unfortunately cut short by the war, but has now been resumed. The best of the Binet tests are retained in all three versions. Hence by basing the I.Q.'s on these tests alone we can obtain comparable figures. These have been further checked by repeating the same group tests.

(*a*) On taking the average I.Q. for fairly large and representative samples, and averaging the differences obtained from comparable groups, I find an average rate of decline amounting to 0.87 points in 20 years, or about 1.3 points in one generation. None of the reliable differences exceeds 1 point in 20 years, or about 1.5 points in a generation.

(*b*) Slightly more extensive data are available for estimating the proportions of pupils who at the ages of 10-11 fall outside a borderline of 70 I.Q. and 125 I.Q. respectively. These borderlines fall within the zone of doubtful cases for certifiable deficiency and for junior county scholarships respectively, cases for which individual examinations and tests are fairly frequent. So far as the estimates can be trusted, it would seem that within the space of 20 years (1912-32) the number over an I.Q. of 125 dropped from 5.93 per cent. to 5.12 per cent. ; while the number below an I.Q. of 70 rose from 1.54 per cent. to 1.71 per cent. If we ignore the possibility of extraneous influences, a drop of the former type might be expected from a decline in the mean I.Q. from 100.0 to 98.9 ; a rise of the latter type from a decline from 100.0 to 99.5 ; i.e. in 30 years a decline of about 1.65 and 1.00 points respectively.

A wide margin of error must be allowed for imperfections in sampling, testing, and smoothing gradients. And even if we ignore these sources of error, it would still be somewhat rash to accept such estimated changes as due solely to differential fertility. After an interval of 20 years the families residing within a given London borough are no longer the same. In all except the poorest boroughs about 30 per cent. of the population have been born outside the county. On the other hand, many of the families, particularly among the better classes, have moved beyond the boundary. While in some areas slums have been cleared, in others good houses have deteriorated, and have been let as apartments for poorer new-comers. On striking a balance, it would seem that, on the whole, such migrations must themselves have led to a slight decline. This seems confirmed when we restrict the comparisons to families who have remained in the borough most carefully studied throughout the whole period: however, this mode of comparison involves dropping rather more families of a better type, so that the figures must still be somewhat affected by selection of the same type. On attempting to make due allowances I reach a figure between 1.0 and 1.5.

It will be noted that, particularly when we attempt to allow for these irrelevant factors, there is an appreciable discrepancy between the estimates reached with indirect and direct methods respectively. The indirect method suggests a decline of about 1.9 points, possibly more; the direct method suggests a decline of 1.5 points at the outside, probably much less. Of the two figures, the higher seems the more questionable. Were we to accept at their face value the proportions reached by the indirect method and set out in Table I, we should infer that the rate of change in the proportions of bright and defective children had been decidedly rapid. Taking the proportionate number of parents of a " scholarship type "[1] or a " mentally defective type " respectively as given in that table, we should conclude that, in the preceding interval of about 30 years, the number of the former had dropped from 2.7 to 1.8 per cent., and the number of the latter had risen from 1.1 per cent. to 1.5 per cent. I find it very difficult to believe that changes so large and so rapid as this have actually been taking place. They would imply a decrease or an increase of nearly 50 per cent. in the number of children awarded junior county scholarships or certified as mentally deficient. Changes so great as this, even if spread over 30 years, could hardly fail to excite spontaneous comment from teachers, medical officers, and officials of the Education Department.

A critic may perhaps object that, since all London children are subjected to much the same type of elementary education, its effects may easily obscure the actual amount of decline when we try to assess it by mental tests. But the objection seems sufficiently answered by the fact that changes resulting from migration are not obscured. They remain plainly discernible in the test-results: e.g. in certain smaller districts, from which slum populations have been removed, and in other districts into which such a slum

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[1] The designation " scholarship type " was originally based on the award of junior county scholarships in London at the beginning of my work. In 1912–13, out of 82,000 children aged 11, 1,655 children obtained such scholarships—a proportion of just over $2 \cdot 0$ per cent. This suggests a borderline of $+2 \cdot 05$ S.D.; that is, with an S.D. of about 15 I.Q., a borderline of 130 I.Q. After that date the proportion rapidly increased; and today the phrase " junior county scholarship type " would be almost devoid of meaning. However, the borderline roughly coincides with the lower level of those who secure entrance scholarships to universities and obtain an honours degree. Consequently, the term may perhaps be permitted to stand as a convenient label for the top category. By " mentally defective " is meant children certified as fit for " special schools for the mentally defective ". Here the borderlines are 70 to 50 I.Q. The lower figure excludes ineducable imbeciles and idiots, who would bring the proportion to just under $2 \cdot 0$ per cent.

population has been transferred, a comparison of the test-results obtained before and after the transferences (in several cases, 5 to 8 years afterwards) has revealed a well-marked shift in average mental level—sometimes as much as 6 points. Indeed, not only in London, but in industrial and rural areas outside the county, the greatest and most readily established changes in the average I.Q. seem traceable to migration rather than to alterations in the native endowment of the stationary elements of the population.

However, the possible effects of environmental influences may be considered from another point of view. During the last 20 years teaching methods for dull and backward pupils have greatly improved ; better health facilities, both before and during school years, must have appreciably increased their physical fitness. Consequently, those who hold that such conditions must have a discernible influence on test-results might argue with some plausibility that the apparent amount of decline must form an underestimate. Personally I should attach little importance to this argument. An experienced psychologist, diagnosing mental deficiency in borderline cases, never accepts the results of a given test, just as they stand, without considering the possible effects of educational or physical handicaps. Hence, at any rate in the figures for mental defectives, no further allowance seems necessary.

But there is yet a third possibility, which perhaps deserves consideration. It is tempting to speculate whether the commoner methods of forecasting changes in mental level indirectly from the I.Q.s of families of different sizes may not assume an over-simplified mechanism for human heredity. It is conceivable, for example, that some kind of reversional or regressional effect may operate, which is not allowed for by the usual methods of calculation, and which tends to keep the mean of the population (as well as the variability of the population) rather more constant than the usual methods of computation would imply. Statisticians have repeatedly drawn attention to the fact that certain statistical characteristics of human populations show an unexpected constancy—as if, once a biological equilibrium had been reached, the population tends to preserve it, in spite of disturbing changes.[1] Most of the evidence adduced for this notion is admittedly inadequate ; yet it is enough to make the theorist pause before prophesying an inevitable change on the basis of apparent trends. In genetics the classical experiments on " pure lines " remind us that to predict an alteration in traits from a knowledge simply of the selective factors apparently at work may be altogether rash in the absence of any supplementary knowledge about the way those traits are genetically determined. On the other hand, the dysgenic effects that might be anticipated from the selective incidence of the death rate during wars have been more often falsified than confirmed by subsequent attempts to verify the predicted changes (compare, for example, Gini's examination of the effects of the last war on the population of Italy).

For all these reasons I am convinced that far more extensive studies are required before we can venture to specify a definite figure for the actual

[1] The most familiar instance is the widespread belief that, when a tribe or nation loses a large proportion of its males in war, Nature at once redresses the balance by temporarily increasing the ratio of male to female births. The theory of statistical stability has its best-known advocates in Quetelet (*Corresp. Math. et Phys.*, vii, 1832, pp. 321–46) and Lexis (" Über die Theorie der Stabilität Statistischer Reihen ", *Jahrbuch f. Nat. Ökon. u. Statist.*, xxxii, 1879, pp. 604–23). Weak as they now seem, some of their arguments at least merit re-investigation. It is unfortunate that nearly all psychological discussions on the effects of differential fertility are still couched in terms of pre-Mendelian notions of heredity. For the views of the modern geneticist on the problem, I may venture to refer to Prof. J. B. S. Haldane's book on *Heredity and Politics* (1938); he suggests practically the same figures as I have reached in my own reports (" 1 or 2 points per generation in the mean I.Q. of the country ", p. 117).

amount of decline in any given area. If required to make a guess at the most probable figure for London, I should be disposed to put it as nearer 1.5 I.Q. points per generation than 3.0 points.([1]) I should be surprised if it was much lower than 1.0 point or much higher than 2.0 points.

(6)

Rate of Decline in the Country as a Whole

From investigations made elsewhere, either personally or with the aid of research students, I am inclined to conclude that, in other industrial towns, the rate of change cannot differ greatly from that obtaining in London, but that in rural areas it is, in all probability, appreciably larger.([2]) On an average, I suggest 1.5 points (or slightly less) for urban areas and 2.0 points for rural areas.

The estimates which appear to diverge most from my own estimates are those subsequently obtained by one of my former students, Dr. Raymond Cattell, in Leicester and Devonshire.([3]) His double survey is one of the largest hitherto made ; and covers 3,734 schoolchildren. His figures indicate a decline of 3.1 I.Q. in the urban area and 3.3 I.Q. in the rural area. He finds that, during one generation, there has been " approximately a 30 per cent. increase of mental deficiency " and that (at any rate in the country) " the very able children have been cut down by almost a half ". He explains the divergent estimates by saying that " London is scarcely typical of urban life ". Even so, however, I feel sure that such a " galloping plunge towards intellectual bankruptcy " (as he describes it) would have aroused spontaneous comment from the school teachers and education officials. In my own view the divergence is more probably due, not to difference of locality, but differences (i) in tests and (ii) in sampling.

(i) As my own figures had been criticized on the ground that the tests used were dependent on educational and social facilities, he decided to use a non-verbal group test. As he explains in his preface, we discussed together the general methods to be adopted in his test-survey ; so that, in general, the procedures used should be comparable. Now, as his diagrams show, his test yields an S.D. of 19.4 I.Q. for the lower half of the distribution and 24.2 I.Q. for the upper half. Thus 3 points on his scale would correspond with only 2 points on mine. In spite of this change in the S.D., he retains my borderline of 70 I.Q. for mental defectives. As a result, 5 per cent. of the Leicester elementary school children are classed mentally defective (4.2 per cent. of the sample).

(ii) In his Leicester sample over 20 per cent. of the children were drawn from preparatory, public, or private schools. An inclusion of so large a proportion with an exceptionally low birth rate would of itself tend to exaggerate the amount of the apparent decline. If due allowance were made for these features, Cattell's figures would approach much nearer to my own.

All other investigators report figures suggestive of a somewhat smaller rate of decline. In Sheffield, Bradford([4]) tested 393 boys and girls with the Otis test, and found a correlation of − 0.25 between intelligence and size of family : the average size of family decreased from 4.4 to 2.6, with an

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([1]) This higher figure is Cattell's: see below.

([2]) As mentioned elsewhere, the other areas which I myself investigated were Liverpool, Birmingham, and certain Warwickshire villages.

([3]) *The Fight for Our National Intelligence*, P. S. King, 1937.

([4]) Bradford, E. J. G., *Forum of Education*, iii, 1925, pp. 186–94.

increase in test-score from 5 to 45. On the London revision of the Binet scale, this would (I estimate) amount to a decline of about 1.9 I.Q

Some of the most instructive studies in this field are those initiated by Prof. Godfrey Thomson. I venture to think his conclusions all the more convincing, because he was himself at one time so strong a critic of any theory which treated "intelligence" as more than a purely statistical "factor", i.e. a simple average of a person's performances in a number of different tests. In conjunction with Dr. H. G. Sutherland he tested in two successive years nearly 2,000 pupils at elementary schools in the Isle of Wight, and over 800 boys at three institutions of the grammar school type. At the former the correlations with size of family were − 0.15 for one year and − 0.22 for the next ; at the latter the correlations were naturally lower, but, in view of the selection, quite consistent with those from the unselected samples.[1] The tests used, however, were group tests, requiring ability to read ; and the "I.Q. categories" were given in terms of letters, not of numerical quotients. However, from the diagrams given, it seems possible to calculate an equivalent I.Q. on the Binet scale. Adopting the same methods of computation as for London children, I find a decline of 1.9 I.Q.—almost exactly the same figure as before.[2]

The most recent and most thorough survey would seem to be that carried out by Dr. Fraser Roberts and his collaborators in Bath.[3] Here every endeavour was made to secure a sample of school children representing a *complete* cross-section of the population. The group comprised all who were born between 1st September, 1921, and 31st August, 1925, and whose homes lay within the boundaries of the city on 27th July, 1934. These numbered 3,401 ; and full data were obtained for all but 96. All were tested by the Otis group tests (advanced scale) ; and 1,271 were also tested in addition by the Binet tests. The latter enabled the results from the Otis tests (which are expressed in terms of an "Index of Brightness") to be converted into terms of the more familiar Binet I.Q. ; and incidentally showed that the use of a verbal group test had apparently "introduced no extra association, but, on the contrary, being a less efficient measure of intelligence, if anything minimized it".

The correlation between intelligence and size of family, measured by the number of each child's "living full sibs", proved to be − 0.224. The average size of family increased from 2.0, for an Index of Brightness of 210, to 4.8, for an Index of Brightness of 30 ; dropping, however, to 4.0, for an Index of 10. In terms of the Otis scale, the mean intelligence for all *children* was 99.8 ; the mean intelligence for all *families* (i.e. the mean which would be obtained if all families were of equal size) was 103.9. This indicates an average decline of 4.1 points per generation on the Otis scale. If we translate this into terms of the Binet scale, we obtain a decline of 1.6 or 2.0 I.Q points, according as we employ the regression of the Binet

[1] Sutherland, H. E. G., and Thomson, G., *Brit. J. Psych.*, xvii, 1926, pp. 81–92. Later investigations with specially chosen homogeneous populations (children of Yorkshire coal-miners, and children whose parents had been killed in the war) were undertaken with a view to demonstrating that the negative correlations were attributable primarily to hereditary ability rather than to home environment: see Sutherland, *J. Educ. Psych.*, xx, 1929, pp. 81 *et seq.*; *id.*, *J. Genet. Psych.*, xxxviii, 1930, pp. 161 *et seq.*

[2] Professor Thomson (in personal correspondence) has been good enough to express agreement with the mode of calculation adopted.

[3] Fraser Roberts, J. A., Norman, R. M., and Griffiths, Ruth, "Studies on a Child Population, III", *Annals of Eugenics*, viii, 1938, pp. 178–215: cf. "Intelligence and Family Size", *Eugenics Review*, xxx, 1939, pp. 237–48. The survey was carried out under the auspices of the Burden Mental Research Trust, which owes its existence to the generosity of Mrs. Burden, of Clevedon Hall, Somerset.

scale on the Otis or the Otis on the Binet ; and once again we reach an average figure remarkably close to those furnished by previous investigations.

Three special groups were selected from the whole sample. These were composed of the brightest, the dullest, and the average. Among both the average and the dullest there was a clear association (-0.21 and -0.24) between father's occupation and size of family. Here, therefore, even within a fixed level of intelligence, there is still a definite correlation between social class and fertility. Among the brightest, however, no such correlation was discernible. Consequently, assuming the small sample of 140 to be typical, we may reasonably infer that intelligent families from the poorer or lowlier classes must be just as infertile as among the higher social classes. However, as Dr. Fraser Roberts points out, these further analyses serve mainly to indicate how extremely complex the whole problem of differential fertility really is.

(7)

Alleged Increase of Mental Deficiency

The foregoing estimates have been reached by what I have called the indirect method. For the country as a whole the nearest approach to direct evidence is to be obtained from a comparison of the figures for mental deficiency reported by the Royal Commission on the Care and Control of the Feeble-minded in 1907 and by the Joint Committee on Mental Deficiency in 1929. As a member of the latter committee, I may be allowed to comment on some of the data. I was asked to draft the standards and borderlines used in the committee's investigations ; and the scale of intelligence tests adopted (my own revision of the Terman-Binet scale) was the same as that employed in London.([1]) Hence both the borderlines used and the figures obtained may be assumed to be comparable with those adopted for the school surveys in London described above. From his inquiries in 3 urban and 3 rural areas, Dr. Lewis (medical investigator for the committee) calculated that over the whole of England and Wales the incidence of mental deficiency in 1925 amounted to 8 per 1,000—6.7 in urban and 10.5 in rural areas (loc cit., p. 82). From inquiries carried out in 1904-7, the Royal Commission on the Care and Control of the Feeble-minded had reported an incidence of only 4.6 per 1,000. It was the unanimous view of the members of the committee, and of Dr. Lewis himself, that, as he puts it, " the greater thoroughness of the ascertainment accounts for a large, if not the greater, part of the increase ".

When appointed Psychologist to the London County Council in 1912, one of my first tasks was to study the methods at that time available for ascertaining cases of mental deficiency and to consider possible methods of improvement. The figures I then obtained make it possible to hazard a guess at the additional number that might have been detected had later methods of assessment been available. I estimate that, with methods like those adopted for the Joint Committee's investigation, the Royal Commission's figure would have been increased to about 5.1 per 1,000. But it must also be remembered that the increasing care given, especially during infancy, to the mentally deficient, must have favoured the survival of a larger proportion at the time of the later survey: a comparison of mortality rates suggests that, with the later rate of survival, the Commission's figures would have been raised to something like 6 per 1,000 ; and, taking areas corresponding to Dr. Lewis's, I calculate that the comparable figures would have been (very roughly) about 5.5 per 1,000 in urban and about 7.5 per

([1]) Report, Pt. II, Chap. 2, pp. 37 f. and Appendix B.

1,000 in rural areas. This implies a rate of increase amounting in (say) 20 years to about 20 per cent. in urban and 40 per cent. in rural areas. The difference between the urban and the rural rates is, as Dr. Lewis suggests, probably due in part to differences in fertility, but mainly due to the migration of better stocks to the towns during the period in question. The allowances and estimates are, of course, little more than plausible guesses. An increase of 20 per cent. in 20 years would have raised the figure for feeble-minded children in London from 1.54 per cent. to about 1.85 per cent. Actually, as we have seen, it apparently rose to only 1.71 per cent. But, if we consider that the increase was doubtless greater among the ineducable grades, the two calculations agree reasonably well.

Influence of Qualities other than Intelligence

No psychologist would maintain that innate intelligence is the sole factor making for civic or industrial efficiency. Some may therefore be tempted to argue that the more fertile classes, though less intelligent, might possess other qualities of equal or even greater important—e.g. superior physique, superior manual or practical aptitude, superior moral qualities, like courage, candour, or freedom from nervous breakdown. In reply three points may be briefly noted. (i) The popular notion that children and adults of super-normal intelligence (the so-called " geniuses ") are by nature more neurotic or degenerate—lacking in physical health, emotional stability, or moral firm-ness—has been completely disproved by numerous psychological studies. (ii) Moral and emotional qualities, whether superior or inferior, appear to be far less dependent on innate constitution and heredity than on post-natal and environmental influences. (iii) If class differences in innate specialised abilities exist, they must unquestionably be far smaller in amount and import-ance than the differences in intelligence, as above defined ; what is popularly regarded as a specialised talent or aptitude is really a resultant of both high general intelligence and some more specialised ability or interest.

In any case, it may be safely argued that innate intelligence is the main factor *limiting* efficiency in practically every sphere of modern life: if not a " sufficient " cause of success, it is at least a " necessary " cause, i.e. a *sine qua non.*

(8)
Final Conclusion

So far as the available evidence can afford any guide, therefore, I am inclined to hazard the guess that, during the past generation, the decline in the I.Q. has varied about 1.5 points in urban areas and about 2.0 points in rural areas. 1.5 points on the I.Q. scale would be equivalent to about two mental months at the age of 10—or three mental months for adults ; 2.0 points would be equivalent to four mental months for adults. But, even with these conservative estimates, a decline of this order would have grave effects on the mental status of the population if at all prolonged.

This perhaps can be best illustrated if we suppose the same rate to continue until the end of the century—not because I imagine the rate will remain constant, but because the rate is more clearly expressed if referred to a longer interval. Accordingly, I have tabulated the approximate results for children of the special, ordinary and secondary school class. This restriction omits ineducable defectives at one end of the scale and pupils of a public school type from the other. However, the former are largely pathological cases ; and estimates for these would be somewhat precarious, especially as they often come from families which are far smaller than those of the feeble-minded. For other reasons, it is almost as difficult to obtain plausible

estimates for both numbers and I.Q.s of public school pupils. Rural areas differ still more widely in their average level. Some are above, most below, the level found in urban areas ; but the data are again exceedingly inadequate. Hence for simplicity I have started with a single initial distribution, namely, that for the London area, which appears to be the best established.

TABLE III

Estimated Distribution of School Population with Declining I.Q.

Assumed Rate of Decline per Generation		1·5	2·0	1·5	2·0
Approximate Type	I.Q.	1920	1950	1950	2000	2000
Scholarship	over 130	1·8	1·4	1·3	0·8	0·6
Central School	115–130	12·2	10·3	9·8	7·6	6·7
Good average	100–115	35·1	33·4	32·4	29·9	27·2
Poor average	85–100	37·5	38·6	39·3	40·5	41·3
Dull and backward	70–85	11·9	14·2	14·9	17·9	20·1
Feeble-minded	under 70	1·5	2·1	2·3	3·3	4·1

It will be seen that, if the rate assumed continues, then in little over 50 years the number of pupils of " scholarship " ability would be approximately halved and the number of feebleminded almost doubled. These results to my mind form a far more serious consequence than the lowering of the general average by about five I.Q. points.

But, as the reader will have perceived, at almost every stage of the discussion the argument has been gravely hampered by serious weaknesses in the data. I venture to urge, therefore, that systematically planned inquiries should be carried out by trained psychologists, and that in the planning, as well as in the final analysis, they should be assisted by statisticians familiar with the requirements of modern statistical procedures. In areas where fairly complete surveys have been already carried out, the inquiries might be repeated with the same tests and (so far as possible) with the same families. In addition to the surveys made in London, Bath, and Scotland, many education authorities have used intelligence tests on an increasing scale ; and the samples thus available for comparison must now be fairly numerous. But fresh surveys with newer modes of testing are urgently needed on other grounds: as a nation we should know our resources in mind-power as accurately as we do in man-power, iron, or coal ; and if the numbers included in such a census were sufficiently large, it would not be necessary to wait a whole generation before the survey was repeated.

APPENDIX
ON THE MEANING OF INTELLIGENCE

Intelligence as a Technical Term. The fact that children of more intellectual parents do better in " tests of intelligence " than children of duller parents does not of itself prove that the differences so disclosed are due to inheritance rather than to differences of environment or opportunity. It is therefore essential to ask what it is that so-called " tests of intelligence " really measure.

Most of the current controversies[1] about the inheritability of " intelligence " arise from a confusion over the different meanings attached to the word. As a rule, those who have attempted to show that intelligence is not affected by inheritance to any great extent take the word to mean either intelligence in some broad and popular sense, or else intelligence as actually measured by tests of intelligence, which are admittedly imperfect instruments. In this paper, on the other hand, the term has been used with a more limited and technical connotation.

[1] That the views I have attributed in the text to the " majority of present-day psychologists " are not shared by every psychologist without exception is sufficiently shown by the criticisms contained in a book published earlier in the present year (J. Blackburn, *Psychology and the Social Pattern*, Kegan Paul, 1945; see esp. pp. 7–8, 61–78, and 86). Since similar doubts are still felt by certain social writers, it seems necessary to devote a few pages to their examination.

The word "intelligence" and its synonym "general ability" owe their currency among psychologists largely to Galton and Binet. Nor can there be any doubt that what these two pioneers had chiefly in mind, and were seeking to assess, was inborn or "natural" ability. Since subsequent research has so fully confirmed their main assumptions, it seems reasonable to employ the word as they employed it.

Intelligence as a General Factor. Earlier investigators, it is true, questioned the existence of anything that could be called *general* intellectual ability, on the ground that the correlations between tests of intellectual abilities were so low.[1] This, however, as is now universally agreed, was due chiefly to the fact that the groups tested had, as a rule, already been selected for general intellectual ability. All recent investigators find fairly large correlations, running up to 0.6 or more between assessments of cognitive ability of every kind. It follows that a test-measurement for intelligence is not merely an average (or a weighted average) of independent test-performances; it is an average of *closely related* test-performances. In this sense it is a "common factor". Nevertheless, a mere analysis of correlations cannot demonstrate that such a "factor" is anything more than an abstract, statistical concept.

Intelligence as an Inheritable Factor. There is now, however, overwhelming evidence to show that, of the individual differences revealed by tests of this "general factor", the greater amount is due to the individual's innate or inherited constitution. The main lines of argument may be briefly summarized as follows:[2] (1) the commoner forms of "mental deficiency" consist essentially of a deficiency in general intelligence, and these forms are demonstrably innate. (2) With the exception of the rarer clinical types, certifiable "mental deficiency" differs only in degree, not in kind, from the still commoner instances of irremediable "dullness"; and this also appears to be handed on by inheritance, often in the same families as are producing the definitely defective. (3) At the other end of the scale, supernormal ability appears disproportionately common in members of certain families (not necessarily in the same homes). (4) The correlation between the tested intelligence of members of the same family is of the same order as the correlations between their heights or weights, and increases with the closeness of the family relationship (e.g. between identical twins it is as high as 0.86; between siblings it averages about 0.50—rather less, viz. 0.35 to 0.45, when the apparent effects of similar cultural environment is partialled out; between first cousins, 0.30; between second cousins, 0.24). (5) The mental differences between individuals of the same economic class are far wider than the differences between the mental averages for different economic classes: in particular, children brought up in the most unfavourable conditions may show extremely high I.Q.s; while children brought up under the best of conditions may be dull or even mentally defective. (6) Children of highly intellectual parents obtain proportionately high scores even in tests of a laboratory type, such as cannot possibly be affected by environmental advantages.[3] (7) Changes in environmental conditions, and changes in health or emotional attitude, make very little difference to the I.Q. when properly assessed: the most marked environmental changes rarely alter it by more than 5 to 8 points.[4] (8) To study cases where the environment is virtually the same for all, we can test children brought up from earliest infancy in residential institutions or foster-homes: under these conditions the children still show wide differences in tested intelligence, and its amount proves to be correlated with that of their relatives, the correlation itself varying with the closeness of the relation: a striking case is the high intelligence often shown by illegitimate children of dull or poverty-stricken mothers, when the father (possibly a casual acquaintance) was of high intelligence. (9) To study cases where heredity is practically the same, we can test identical twins: the amount of resemblance between the intelligence of identical twins is 0.86

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[1] On these grounds, Thorndike, originally the chief opponent to the "general factor theory", held that the mind was merely a "host of highly particularized and independent faculties" (*Educational Psychology*, 1903, p. 39). He has, however, since abandoned his opposition (*The Measurement of Intelligence*, p. 421).

[2] The majority of textbooks confine themselves to evidence obtained by psychological investigators in America: this is admirably reviewed in Sandiford's *Foundations of Educational Psychology* (1938; cf. pp. 71–129 and refs.). But such evidence is naturally not altogether convincing to British critics. Accordingly, a review of relevant investigations in this country was included in a recent paper on "Ability and Income", *Brit. J. Educ. Psych.*, xiiit 1943, pp. 83–92.

[3] This was the approach adopted in the investigation carried out at Oxford (*Brit. J. Psych.*, iii, 1909, esp. pp. 169–76). Its primary object was to show that intelligence was *both* a "general" factor *and* an "innate" factor. Critics of that early effort, however, like Dr. William Brown, concentrated rather on the first point, feeling no doubt that, if there was no cogent evidence for a general factor, then the question of its innateness did not arise. However, Dr. Brown has now entirely withdrawn his objections to the general factor theory (*Brit. J. Psych.*, xxiii, pp. 352–66). As regards the second point, therefore, I venture to suggest that the line of approach adopted in my original paper is still the most conclusive, though perhaps the least striking: it is applicable to *all* degrees of intelligence, whereas the more usual lines of argument (from the mental defectives, geniuses, twins, etc.), if standing alone, might fail to convince, because (it could be held) they are concerned with somewhat exceptional types.

[4] Cf. Burt, *Mental and Scholastic Tests*, pp. 152–7; Sandiford, *loc. cit.*, pp. 91–4 and refs.

(almost as high as the correlation between two successive testings of the *same* individual). Even when the twins have been reared separately from early years, the correlation is still 0.77—far higher than that between brothers or sisters brought up in the same home.

In these and other respects the inheritability of tested intelligence is thus remarkably like that of stature. The measurable height of a child may be reduced by illness or malnutrition, particularly during infancy; but that does not obscure the fact that the main determining influence, especially when all are brought up in favourable conditions, is still the individual's inborn constitution. And the same holds good of the measurements obtained with intelligence-tests.

Definition of Intelligence. Accordingly, I think it safe to say that the vast majority of psychologists would now agree that, of the variance exhibited by measurements of the hypothetical factor underlying all cognitive tests, one half *at the very least* is attributable to " nature " as distinct from " nurture ". Hence, in view of its evident importance, we need a special term to describe the " native " part of the " common factor ". Since this native component corresponds precisely with what the testers of intelligence originally set out to measure, it seems appropriate in psychological discussions to keep their term intelligence for this particular component, and so to define intelligence as *innate, general, cognitive ability.*

As thus defined, intelligence is merely a distinguishable influence, not something that can be separated in actual fact, or measured in isolation. Our knowledge of it is therefore bound to be imperfect. But I would add that, even if we adopt the view of the more cautious writers, and insist that intelligence may be no more than a statistical construct, the foregoing arguments about the decline of the average level of this common factor would still hold good. However, I personally believe that there is further evidence of a non-statistical kind which enables us to give a more concrete interpretation to the term.

A Physiological Interpretation. The mental processes essentially required by intelligence tests involve the integration of a variety of perceptual and motor activities into a systematic whole: the more the processes tested depend on this integration, the closer they correlate with intelligence. Now the essential characteristic of the central nervous system is, in Sherrington's phrase, its " integrative action ". Hence it is natural to suggest that the individual differences in integrative capacity revealed by the tests may be primarily due to differences in the neuronic architecture of the central nervous system. The histological study of the cortex shows that in feeble-minded persons the neurons are (i) comparatively few·in number, (ii) have comparatively few branches, (iii) are less systematically arranged. These are precisely the kind of sturctural differences that we should expect if the foregoing suggestions were true. We may plausibly suppose that, in normal members of the population, somewhat similar if less conspicuous variations in the cortical architecture are also present. Further, since any given kind of bodily tissue tends to be of much the same general quality in the same individual wherever it is found (e.g. muscle, hair, skin, etc.), we may expect that the nervous tissue would also have the same structural qualities throughout the individual's nervous system, or at any rate throughout his cerebral cortex, though, of course, with minor regional differences. Finally, being structural, these differences may readily be conceived as being largely, if not mainly, dependent on genetic factors, i.e. in popular language, as being inherited or at least innate.[1]

Alternative Definitions. (1) The best-known statement of the case against the hereditarian view is that of Bagley, who represents the self-styled school of " rational equalitarians ". His first paper,[2] which virtually started the psychological controversy, left his critics with the impression that, in his opinion, " human mentality alone among all biological traits is not subject to biological variation "; and that differences alike in everyday efficiency and in efficiency at intelligence tests were due mainly, if not solely, to the physical, social, and educational advantages or disadvantages of the individual tested. Similar contentions are still frequently brought forward by medical and social writers who distrust the evidence of intelligence tests.

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[1] I believe this expresses the tacit assumption of most psychologists, though it is seldom stated explicitly. The nearest approach is to be found in Thorndike's recent " quantitative hypothesis ", viz. the hypothesis that " quality of intellect depends on quantity of neural connections " (*The Measurement of Intelligence*, Chap. xv). As an adherent of the old associationist school, Thorndike identifies the qualitative superiority of intelligence with a superiority in " the number of possible associations the individual mind can make ", and attributes this to the " number of possible contacts in the associative neurones ". He refers in passing to the view that higher forms of intellectual activity may be dependent on " integration, that is, capacity for having the neurones act with reference to one another ";but considers it an open question whether such a capacity (if it exists at all) may not be independent of intelligence as he conceives it.

[2] Bagley, W. C., "*Democracy and the I.Q.*", incorporated as Chapter I in the volume cited below.

In his later replies,[1] however, Bagley points out that his original arguments were misunderstood. He makes it clear that he was adopting a very broad interpretation of the word intelligence and defines it as " the ability to control behaviour in the light of experience ". His real view is (he says) that " general intelligence depends in part on physiological functions, and must therefore *in part* (his italics) be determined by original endowment or physical heredity " ; but at the same time social conditions (e.g. " systematic schooling ") are so overwhelming in their influence that they can " counteract " the minor differences resulting from original nature, and " level up ", the inborn disadvantages. What he chiefly protests against is the notion that innate endowment " sets a limit to a child's educability ". But, as a more recent critic has observed, " if education were as powerful as Bagley implies, how is it that dull and defective children in good homes—e.g. a feeble-minded boy, born to a medically qualified university professor—are not levelled up by these social advantages to the performances of their brothers and sisters, who may perhaps win first-class honours? "[2]

(2) A second group of American critics, chiefly members of the " behaviourist school ", have endeavoured to abolish all hypothetical concepts which cannot be " operationally " defined. These writers prefer to re-define intelligence as " what intelligence tests measure ".[3] It is then not difficult to show that intelligence as thus defined may be appreciably affected by health, fatigue, social environment, and educational facilities. The main argument for the operational type of definition is drawn from the practice of physical science. Yet no physicist, I imagine, would press this principle to such extreme lengths. Suppose we have a machine originally devised to measure energy supplied from some source, and that the energy so supplied (W_0 say) cannot be measured directly ; " operationally " we can only measure the energy delivered by the machine (W_1 say), and estimate the wastage due to friction (F). Would any physicist hesitate to estimate the amount of supplied energy by the equation $W_0 = W_1 - F_1$, or complain that this would entail an undesirable " hypothetical concept "?

It seems clear, then, that the arguments against the influence of heredity are largely due to a confusion between three things: (i) so-called " intelligence " as manifested in daily life ; I would prefer to call this " general intellectual efficiency " ; (ii) " intelligence " as measured by some one test (without adjustment for irrelevant factors); this I would call " tested intelligence " ; (iii) the innate component in these manifestations, i.e. innate general intellectual efficiency: and I suggest that the term " intelligence ", when used without qualification, should be understood to refer to this and to this alone. That, after all, corresponds with the usage of most psychologists.

It will be noted that the position which the two schools just mentioned set out to attack is the alleged identification of (ii) and (iii). This position, they assert, is that of " recognised psychologists who naïvely assume that the tests actually measure pure native ability unadulterated by the products of schooling ".[4] But, to the best of my knowledge, no " recognised psychologist " has ever maintained that tests " actually " measure " pure " ability. Every psychologist admits that the I.Q.s furnished by intelligence tests, particularly when automatically accepted without check or correction, may be influenced in *some* degree by schooling and other environmental differences— influences which (if he is estimating intelligence in the sense of *native* ability) he regards as errors to be eliminated as carefully as possible before a child is classified as mentally defective.[5] The difference between two opposing parties therefore really reduces to a question of relative importance or degree.

[1] Bagley, W. C., *Determinism in Education: Papers on the Relative Influence of Inherited and Acquired Traits in Determining Intelligence* (1925). Bagley cites my own investigations on the Binet scale as " the only thorough-going attempt to determine what schooling contributes to intelligence as determined by tests "; and repeatedly quotes my figures as showing that " not less than 54 per cent. of whatever it is that is measured as native intelligence turns out to be the result of experience and training " (*loc. cit.*, pp. 18, 75 f., 133 f.). What I claimed to show was that something like 54 per cent. of the variance revealed by the *original* Binet scale (as published in 1911) appeared to be attributable to differences in home-environment or schooling (in the original scale many of the tests, since dropped, were tests of reading, writing, arithmetic, familiarity with money-matters, and the like): even so, 33 per cent. was attributable to " native intelligence ".

[2] In America the controversy between the hereditarian and the environmental schools was revived for a time by the publication of work on the improvability of I.Q.s among very young children by a group of investigators working at Iowa under the lead of Dr. Stoddard. Their results, however, have not been confirmed by other American investigators; and nearly all who have discussed the inferences drawn have pointed out the obvious fallacies in the arguments (see 40*th Yearbook*; I have reviewed Dr. Stoddard's work at greater length in *Occup. Psych.*, xix, 1945, pp. 39—42). Accordingly, although the results reported may be most valuable in suggesting what benefits may accrue from the change in early environment, they can scarcely be regarded as affording valid evidence on the limitations set by innate constitution.

[3] Similarly, Blackburn claims that " all that has been shown is that intelligence tests measure the ability to answer intelligence test questions " (*loc. cit.*, p. 68).

[4] Bagley, *loc. cit.*, p. 133. Similarly, Blackburn protests against the view that " intelligence tests measure innate intelligence *and nothing more* " (p. 68)—a view which has never for one moment been entertained by any competent psychologist.

[5] Dr. Blackburn appears to forget this routine principle when he declares that, as a result of the psychologist's reliance on verbal tests, " an illiterate mechanical genius may find himself incarcerated in a home for mental defectives " (*loc. cit.*, p. 8).

The Contribution of Environmental Influences to the Crude Test-Results. In this country, the doubts expressed by most psychological critics have taken a slightly different line. The majority appear to have accepted the definition of intelligence as an innate general factor ; but a number have doubted the possibility of relying on tests or similar methods for measuring this innate or inheritable component. Two arguments are generally adduced, both, I believe, sufficiently disposed of by more recent evidence.

(1) Most tests of intelligence are verbal tests ; such tests necessarily depend on knowledge of words, and knowledge of words must depend on the education received at home and at school: hence the differences revealed by intelligence tests must in the main be differences dependent on education. In this form the argument can be met by pointing out (*a*) that non-verbal tests of intelligence, though slower and less reliable, nevertheless lead to the same general conclusions ; (*b*) that in dealing with individual cases no practical psychologist would rely on the uncorrected result of a verbal test for his final assessment of a child's intelligence, if he felt that lack of verbal knowledge was a handicap.

In answer to this the critics still maintain that, in whatever form the test is cast, verbal or non-verbal, every test that can be devised must still depend on some kind of acquired knowledge or skill. This ignores the fact that, although we can never entirely eliminate the element of acquisition, we can in most cases equalise it: e.g. the words chosen may be so simple that they are equally familiar to all the testees.

(2) Many critics have maintained that, even if we can equalise the effects of education, nevertheless ill-health, poor feeding, and the fatiguability of the poorer classes must impair their performances in tests of intelligence. This argument is fully refuted by the work of Shepherd Dawson among children in hospitals. He found (and his conclusion has been amply confirmed by other experimenters) that, provided neither the central nervous system nor the ductless glands have been affected, even chronic disease does not perceptibly handicap the children in tests of intelligence, as distinct from tests of education attainments or skill.[1]

(3) The most serious reservation is one which has not, I think been generally noticed. Serious illness or prolonged ill-health occurring in very early infancy might, I believe, permanently impair the development of the central nervous system, and so produce much the same effects as are observable in undoubted cases of inherited dullness. Such causes are likely to be most frequent among the poorer families and lower social classes where infant mortality is high. At the same time, a study of case-histories drawn from such families makes me doubt whether the effects are common or serious enough to introduce any large distortion in the results of the systematic surveys described above.

Further, it may be noted that, even if accepted, criticisms of this kind would not necessarily tell solely in the direction which the critics assume: for on their hypothesis school-feeding, infantile welfare, and better methods of instructing the dull and backward should during the past generation have improved the ability of the less intelligent to answer the tests of intelligence ; in spite of that, the number of failures have increased. Consequently, a more natural inference would be that the amount of decline revealed by repeated testing actually underestimates the amount of decline in innate intelligence. However, it is plain that further research is needed to settle all such questions.

On the main issue, I fancy that most psychologists, both in this country and in America, would now probably agree with the oft-quoted conclusion reached by Barbara Burks, after an impartial analysis of all the available evidence: " Home environment contributes about 17 per cent. of the variance in I.Q. (as actually tested) ; parental intelligence accounts for about 33 per cent. ; and the total contribution of innate and heritable factors is probably not far from 75 or 80 per cent."[2] Sandiford sums up the matter in a sentence: " With intelligence as measured by intelligence tests, the contribution of heredity is about four times as potent as that of environment."[3]

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[1] " Intelligence and Disease ", *Medical Research Council Special Reports*, No. 162 (1931), pp. 4, 51. In improperly constructed or improperly applied tests of intelligence such factors may undoubtedly affect the child. The most obvious instances are to be found in group tests, where the child's score depends largely upon speed: in a properly constructed group-test the problems increase steadily in difficulty so that low marks are due, not to low speed, but to the relative difficulty of the later problems. Emotional or neurotic conditions may affect performances in individual tests, especially if the test is verbal. But the critics who emphasize this point overlook the fact that indications of emotional or fatigued conditions can generally be detected even in group-tests (e.g. the child answers a difficult problem but makes stupid mistakes with easier problems) and the trained psychologist would be alert to allow for or discard such results.

[2] *27th Yearbook*, 1928, p. 309.

[3] *Foundations of Educational Psychology*, 1938, p. 95.

7. THE TREND OF INTELLIGENCE AMONG SCOTTISH CHILDREN

MEMORANDUM BY PROFESSOR SIR GODFREY H. THOMSON[1]

From time to time fears are expressed that as a result of the differential birth rate our national intelligence may be falling. It has long been known that children who have many brothers and sisters tend to make lower scores in intelligence tests (at any rate in group tests of a verbal nature) than do children who belong to small families. There are, of course, many exceptions, but the tendency is a fact beyond question. Its cause is, however, a matter of doubt or even of controversy. If it is due to the financial and educational advantages enjoyed by small, and the handicaps suffered by large families, it is a social problem demanding a social remedy. If, however, it is due to a tendency for unintelligent parents to have larger families, who inherit their lack of intelligence, it sets a serious problem of eugenics, and implies a steady fall in the average national intelligence.

In my Galton Lecture of February, 1946, I spoke of my fear that " the educational system of the country acts as a sieve to sift out the more intelligent and destroy their posterity. It is a selection, I said, which ensures that their like shall not endure ". For the more highly educated marry later, so that the generations are further apart ; and they have fewer children.

In that lecture, after giving some details of experiments from which indirect estimates of such a possible fall in intelligence could be made, I pleaded for a direct experiment. For the man in the street is sceptical and, as I said, "He demands a straightforward measurement of two succeeding generations, and I sympathise ". Such a straightforward experiment has now been made, if not on two succeeding generations, at least after an interval of 15 years.

In Scotland in 1932 a group intelligence test was given to 87,498 children whose eleventh birthday fell somewhere in that year ; almost the complete year-group, which the Registrar-General estimated at 100,300. The missing children were mainly those absent from school on the day of the test. It occurred to some of those interested in the problem that the feared decline in the national intelligence might be investigated by giving exactly the same test to a new year-group, and a suggestion to this effect was made by the Population Investigation Committee to the Scottish Council for Research in Education, which had conducted the 1932 survey. The new survey was carried out (by a committee containing representatives of both these bodies, as well as many others) in 1947, and was financed by generous grants from the Nuffield Foundation and the Eugenics Society ; 70,805 children were successfully tested whose eleventh birthdays fell in that year, out of an estimated year-group of 80,300, the missing cases being again almost entirely absentees on the day of the test, for again most private schools co-operated.

On this occasion much more information was obtained about each child on a sociological schedule (of which 75,211 were completed). On these schedules the teachers recorded the size of the school, whether the area was urban or rural, the child's class in school, the place of his or her birth, the position in the family and its size (e.g., third in a family of six), regularity of attendance, number of changes of school, and particulars of any previous tests. Twins were also noted. Still more information was obtained by a visit by district nurses to the homes of those born on the first three days of each month of 1936, forming a random sample of the whole—the " Thirty-six day Sample ". For these the record shows whether the child

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had been evacuated, and for how long ; the occupation of the father, and the date of the mother's birth ; particulars about the home and the number of occupants ; height, weight and health of the child, etc. Only very few parents raised any objection to these facts being recorded (in complete confidence, needless to say, for only mass statistics will be published). Those born on the first day of alternate months of the year (1st February, 1st April, and so on) were given an individual Binet Test.

All of this meant an extraordinary amount of team work, for all directors of education and their staffs, teachers in all schools, all medical officers of health, all district nurses, students and lecturers in the training colleges, many retired teachers, several university professors, and still others had a share in the project, and, of course, the children and their parents too deserve our warm thanks.

The body of accumulated data will be the subject of analysis and calculation for years, the results of which will be published in a series of volumes, of which the first will appear in the spring. Meanwhile some of the mass results may be given.

The phenomenon of decreasing average score with increasing size of family is fully confirmed beyond all possible doubt. Out of a possible 76 points obtainable on the test, the 7,824 *only* children averaged 42.0 points, and 15,971 children of families of two averaged nearly as much. But thereafter the average score dropped, rapidly at first, then more slowly. For families of four the average score was 35.3, for those of eight the average score was 28.8, and the drop continued. There were families of every size up to 19, the representatives of families of 18 and 19 scoring seven and zero respectively.

Nor does it seem that the drop is due to later children in a family being less intelligent than their elder brothers and sisters, as had been suggested. With our large number of cases the influence of position in the family could be ascertained separately for different family sizes. No influence from this cause was found which could explain the lower scores in large families. For example, in families of six the average scores of the different children, beginning with the first-born, were 31.2, 30.1, 31.0, 30.1, 30.8, 31.9. But admittedly further inquiry is necessary here, for an 11-year-old who is the first of a family of six may ultimately belong to a larger family, while one who is sixth in a family of six belongs to a family which is probably finished. In the Thirty-six day Sample the ages of the mothers are known, and further analysis along these lines may throw more light on this question. All that can be said here is that in every size of family the different positions appear, on a first inspection, to be about equally favourable.

But although this negative association of size of family with intelligence test score was found as strong as ever, the mean score of all the 70,805 children in 1947 was *higher* than the mean score of the 87,498 children tested in 1932, 15 years previously ; 34.5 then has *risen* to 36.7 now, boys having increased 1.3 points and girls no less than 3.2 points of score.

This, at least as a first deduction, seems to show that at any rate no decline in intelligence is going on, whatever may be the cause of the lower intelligence test scores in larger families. And although this naive conclusion may not be justified, and although it may be unwise to say at once that all is well, it is at any rate clear that if adverse selection is indeed going on, it has been counterbalanced, or possibly only masked, by an improvement due to some other cause. The most plausible explanation of the rise is that, whereas in 1932 the schools of Scotland were in large measure quite unfamiliar with tests, they had become very familiar with them by 1947 and did better

in consequence. Such a " false " rise would, of course, bring us no consolation. It might only hide a fall due to selection, which might win in the long run. Or improved nutrition, or better teaching, may be cited as causes of the rise. It is our hope that the separate analysis of results from different districts, from city and country, from reception and evacuation areas, from counties more, or less, accustomed to tests, may help to clear up the paradox.

If, as is possible, the explanation is that all is due to environmental causes and nothing to heredity (the rise in average score being due to general social improvements, the persisting low scores of large families being due nevertheless to their comparative handicaps) then the phenomena are still of great importance, and the negative correlation of family size and " intelligence " may be ironed out in time. If, however, selection is going on, we must beware of being lulled into a sense of security by an improvement which may be apparent only.

The individual Binet tests of samples of 1,000 in 1932 and 1,118 in 1947 may ultimately prove decisive, but at present no firm conclusion can be drawn, for unfortunately the two tests were not identical. The newer Terman-Merrill form of Binet test used in 1947 has different standards from the older Terman test used in 1932. It would clearly have been best to use again the earlier form of the test. But neither the necessary material, nor a sufficient number of workers trained in the older form, were available. The committee has already some data enabling a comparison to be made, but until more data comparing the two forms are accumulated, it would be unwise to make any statement without at the same time giving all the evidence, as will be done in the book.

October, 1948.

Memoranda

SUBMITTED BY MR. R. F. HARROD

CONTENTS

FRONTISPIECE

Endowments payable per child for every child after the
second ; half rates also payable for the second child

(For certain selected income situations)

(For parents who pay insurance contributions of 1s. per £ of income)

Annual income of father(¹)		Benefit in each of the first seven years of the child's life (0–7)	Benefit in each of the next six years of the child's life (7–13)	Benefit in each of the next five years of the child's life (13–18)
		£	£	£
At whatever age of father(¹) child is born	1. 1,000 constant ...	67	134	201
	2. 800 ,, ...	56	112	168
	3. 600 ,, ...	46	92	138
	4. 400 ,, ...	35	70	105
	5. 300 ,, ...	30	60	90
Assuming child is born when father(¹) is 29½ years old	6. 300 in 22nd year rising by 100 at 3-yearly intervals to 1,000 after 21 years	39 rising to 46	92 rising to 106	159 rising to 174
	7. 300 in 22nd year rising by 80 at 3-yearly intervals to 860 after 21 years	37 rising to 43	86 rising to 98	147 rising to 156
	8. 300 in 22nd year rising by 50 at 3-yearly intervals to 650 after 21 years.	34 rising to 37	74 rising to 82	123 rising to 126

(¹)Or mother if *either* her unearned income in the year before the child's birth *or* her earned plus unearned income in the last year before marriage is higher than the income of the father in the year before the child's birth.

INTRODUCTORY NOTE

CONTENTS

PRESENT SITUATION

Preamble

1. The proposal which I have the honour to submit herewith pre-supposes that the present situation is critical and gives ground for alarm. With this basic assumption it would be wanting in sense of proportion to recommend an antidote that would strike an ordinary man as of trivial importance. The decision to have or not to have more children is governed by strong emotional forces; it is not taken without heart-searching; we cannot hope to influence that decision in a great number of cases without making an adjustment in the prospects of parents which they will readily judge to be of appreciable significance. I am accordingly making a proposal which is more far-reaching than the measures recently adopted on the continent of Europe or than the flat rate of allowance of 8s. per week for each child after the first proposed by Sir William Beveridge. But it is not so far-reaching as to be inconsistent with the main features of our economic structure.

Present situation serious

2. I submit no evidence in support of the "basic assumption" that the position is serious, as the relevant figures will no doubt have been provided by experts in vital statistics. We should be most impressed by the persistence of the downward trend in this country during the sixty years before 1933, the magnitude of the decline in the gross reproduction rate from 2.3 to 0.9, and the spread of the habit of low reproduction outwards from the original source of "infection", that is, from the higher income grades to the whole population and from France and England to most of the other countries. It should be observed that the gross reproduction rate of 2.3, estimated by Dr. Kuczynski for mid-Victorian England (1870-2), is not an abnormally high one, either by comparison with our own rates in earlier periods, in so far as these can be computed, or with rates in other countries in that period. It seems to me probable that a natural historian who observed the reproduction rate of a species fall to less than two-fifths of its normal level, would infer that some lethal factor had been introduced into its environment dooming it to fade out of existence. If a way is sought to bring the gravity of the situation home to the general public, the following calculation strikes me as effective. If the difference between the actual births in the period after 1933 and the births which would have occurred had the gross reproduction rate been at the mid-Victorian level (2.3) be regarded as a "loss of life", the loss of life to the country owing to low reproduction was about as great as the loss which would have occurred had we been waging five wars, with fatal casualties in each as high as those in the war of 1914-18, simultaneously and without end.

3. Not much consolation can be drawn from the comparative stationariness in the gross and net reproduction rates in the decade after 1933, first because the gross rate was too low to secure survival even if mortality below the age of 45 could be eliminated entirely, and secondly because the average age of marriage was declining. The net reproduction rate is a valuable measure of what a population is doing to replace itself but not in every case a perfect one. If the average age of marriage falls there is a windfall once-over accrual of births, separate from and additional to any increase which may be due to younger marriages yielding larger families.

Consequently during a period of declining average age of marriage the recorded net reproduction rate requires correcting to obtain a " true " net reproduction rate ; and if during such a period the recorded net reproduction rate is stationary the true rate must be falling. Moreover in a society such as ours which is tending evermore to uniformity of social habits as between different income levels, one must have doubts whether the trend to lower reproduction has reached its limit so long as the lower income groups show a higher rate.

4. Nor can consolation be drawn from the very recent improvement, since a small degree of avoidance of calling-up orders would be sufficient to account for it. It is indeed possible that some evidence may be forthcoming of a " change of feeling " on the part of representative parents. Hopes may be built on this change proceeding further and producing a considerable revival after the inhibitory influences of the war are removed. It may be argued from this that we should wait a little longer and give the alleged new trend of feeling a spell of peace in which to assert itself, before adopting radical measures. I offer two arguments against further delay.

We cannot afford delay

5. If we are to avoid great losses in numbers the rise in the net reproduction rate must come quickly. We have leeway to make up, since it has been below the survival level for some twenty years. The comparative stationariness that has been predicted for our population during the next thirty years, should reproduction remain at the same level and the downward trend in mortality be continued, masks a decline of about one-quarter in the under-45 section of the population which is due to occur on those hypotheses. Thus even if the net reproduction rate rose suddenly to unity at the end of thirty years a loss of many millions would occur thereafter. But it is not likely to rise suddenly to unity in a given year and so the subsequent losses would probably be greater still. If we are to avoid large losses, it must reach unity in much less than one generation from now, and it is hardly likely to do that unless the rise begins immediately. These propositions take no account of the loss of young manhood in the present war, which will seriously aggravate the situation. In these circumstances we cannot afford to allow ourselves a further period in which to wait and see.

6. Secondly, the proposal I put forward may be recommended by its inherent justice as well as its tendency to encourage reproduction. Consequently even if we could be sure, as we certainly cannot be, that the alleged change of feeling would be sufficiently potent to secure survival, there would still be a case for adopting the plan. The fact of the matter is that parents as a class and mothers in particular have had less than justice in our economic arrangements. Parents of larger families have been under greater economic pressure than other members of the community. This has always been unjust in itself, but justice often has to give way to expediency, and in this case the tendency of the race to reproduce itself too rapidly, especially after the decline in mortality in the late eighteenth century, had to be kept in check to prevent over-population. Now that the tendency no longer exists we may redress the balance without peril in favour of parenthood.

RETURN TO OLD BIRTH-RATE NOT DESIRABLE

7. It may be worth stating at the outset that we cannot contemplate a return to the old level of gross reproduction. Malthus was quite right in supposing that it is impossible to combine the low mortality rates which obtain in civilised conditions, with the birth-rate which would result from giving free rein to reproductive instincts. The geometric increase would soon lead to grotesque over-crowding. Birth control in its widest sense is a pre-condition of continued civilisation. Thus it would be wrong as well as fruitless to tilt against the modern idea of deliberately planning the size of the family. It is not required that normal parents should think in terms of a family of six or eight, but rather of four or five, although the more philoprogenitive parents may be encouraged to contribute more than their fair share to the next generation, subject to humane regard for the health of the mother.

TWO GOVERNING PRINCIPLES

8. In devising remedies to meet the serious situation I submit that two principles should be applied, namely, (i) they should be adequate in scale and (ii) they should be national in scope.

(i) *Remedy must be adequate in scale*

9. If we take a broad survey of history and pre-history, we find a great variety of social and economic arrangements some of which were favourable, others unfavourable to reproduction. It is very probable that there was a causal connexion between the type of social system in operation and the contemporary tendency to over- or under-population; Malthus' work failed to stimulate as much enquiry into these problems, as their interest and importance deserve; there is an almost virgin field here for the anthropologist with a biological and mathematical training. Examples are infanticide, and the system of serfdom, under which children were unable to escape from the hereditary plot of land, so that, it being impossible to enlarge the productive resources available to the family, there was a strong prudential motive to limit its size. In historic times it may well be that the Christian condemnation of infanticide was responsible for the increase of serfdom which followed it and provided an alternative check to the undue growth of numbers. On the other hand systems have from time to time prevailed which were especially favourable to reproduction. Thus where there was a strong clan nexus and flexible territorial arrangements, the more reproductive families would by their superior power be able to gain not merely elbow-room for their larger numbers but a larger quantity of land per head. It is against the background of these great variations in fundamental institutions affecting reproduction that one should think of the proper scale of remedy to meet the present situation.

10. It is most improbable that these various customs and institutions were consciously devised in order to stimulate or retard population growth. They probably came about by natural or social selection in reaction to a change in the environment favourable or unfavourable to population growth. Such changes might be climatic or bacteriological or due to new methods of cultivation, providing greater means of subsistence—or smaller means, when disturbing the ecological balance—or the change might be due to the mere lapse of time, as when a group having increased for a number of generations began

for the first time to press upon the means of subsistence. In the new situation if one community had a variant in its social system, favourable to larger or smaller numbers as the case required, it might survive and replace its neighbours by ordinary natural selection, or through its superior power and prestige causing its neighbours to copy the favourable variant. It is possible that human survival will once again be secured by one or other of these selective processes. But this is not a solution that we can view with satisfaction, if the more favourable arrangements originate elsewhere. Consequently the task before us is a new one, namely, to bring about with conscious intent and by deliberate planning the kind of fundamental social adjustment that has probably hitherto in human history been brought about by a selective process. It may seem a formidable task, but is also, I submit, an inspiring one, and must fill us with a supreme sense of responsibility.

11. The idea that it would not be satisfactory to wait for other peoples to give the lead in reviving births does not rest only on a narrow nationalist prejudice. Not that we should altogether despise such prejudice—the events of 1940 have demonstrated the strength and revived the prestige of nationalism in this country, in the sense of a determination to remain masters in our own house. But there is an argument to meet even those who refuse to be impressed with the importance of the mere maintenance of British stock and independence. New institutions favourable to reproduction may well come to birth not in isolation but as part of a wider ideology. For example, it is by no means proved that the Nazi ideology is favourable to reproduction in the long run. But if it is favourable, and if free countries do not of their own volition adapt their social system to the need for higher reproduction, then, despite its defeat in this war, Nazi ideology, or something similar, will triumph in the end. It would be a sad story if our mighty efforts in war were rendered of no avail by the mere failure to reproduce our kind. The free democratic system relies largely on the power of reason and discussion to secure necessary reforms. This population question is the acid test of its power. Unless the free societies which seek to solve their problems by reason are able to maintain their stock, they will in due course be effaced or dominated by others. This might mean another dark interlude in human history.

(ii) *Remedy must be national in scope*

12. The incentive to larger families should be national in scope. We need a revival among all British men and women whatever their party, creed or walk in life. Our plans should be of universal application, and neutral as between conflicting views about the ideal economic organization of society. Thus we should seek a re-distribution of national income favourable to the parents of larger families and the plan should be put into effect whether or not another re-distribution as between rich and poor is proceeding at the same time. The issues are quite distinct in idea and should be kept distinct in practice. Sir William Beveridge's plan for an allowance of 8s. a week for each child in excess of one is excellent in itself, but is not a solution of our problem. It will not appeal to the ordinary man as adequate in scale when assessed against the background of ideas set out in paras. 9-11. And since it was conceived in accordance with his terms of reference as a protection against " want ", it is unlikely to solve the problems of those who would not in its absence experience want ; thus its operative effect would be sectional, not national, in scope.

TWO POINTS CONCERNING CAUSES OF LOW REPRODUCTION

13. I do not propose to enter into the very deep question of the causes of the fall in the birth-rate, save to make two points, one negative and one positive, which are immediately relevant to my proposal.

(i) *Fall in reproduction not due to hard conditions*

14. It is often urged that parents have been caused to reduce the size of their families by the *facts* of insufficient livelihood, social insecurity and the fear of war. This is not a plausible explanation. Whether we compare birth-rates in different countries, different periods or different income strata, it does not appear that a hard lot in life is inimical to reproduction. Rather the other way. This is a very important point. If one accepted the hard luck story, one might build one's hopes for a revival in births on the general improvement in living standards, employment prospects and international security which we are determined to achieve when this war is over. But if an easier and more secure lot in life is not in itself favourable to reproduction, then we must resolutely discard the hope that an improvement in general conditions will encourage births and we must seek other means. This con-clusion is not inconsistent with the view that the *ideas* of insufficient livelihood and insecurity are coming to have a more important influence on parents. The fact of the matter seems to be that as man's actual condition improves, his idea of what is due to him and necessary to his existence rises more rapidly; his ambition always tends to outstrip his achievement. It is a paradox, but well borne out in everyday experience, that the better off people become the more they complain of not having enough money. In regard to the fear of war, it should be observed that this was not very widespread in Great Britain either before 1914 or between 1919 and 1933, the periods of great decline. It is no good bewailing the tendency of man's requirements ever to outstrip his means of satisfying them. We are not likely to succeed in extirpating this trait in human nature, nor should we wish to do so, for it is the motive power of progress. If our people ever became content with their lot, that would be a sure symptom of imminent decadence.

A widespread fallacy

15. At this point notice must be taken of a widespread fallacy. It is often argued that if being better off does not induce people to have more children, family endowment will not do so. The fallacy is crude but prevalent. It is perfectly consistent to hold that an improvement in the average *absolute* standard of living will not encourage births and at the same time to argue that an improvement in the *relative* condition of parents of larger families will do so. If it is seen that the parents of larger families are more prosperous and more secure than the less reproductive members of the community, that will be an inducement to people to achieve that privileged status.

(ii) *" Social security" favourable to spread of low reproduction*

16. There is one change in social conditions to which we may safely—in so far as any statement in this field is safe—ascribe the wide diffusion of a low reproduction rate, namely, the public provision of " social security ". Among the mass of people in the past children have been the principal or sole means of insurance against want. For instance, if there were six children, two might fail to make good in life, another two might be stony-hearted and indifferent to their parents, but it would be very bad luck if two out of the six were not found with means and affection sufficient to keep their parents out of the work-house. The parents of but two children would be in a much more precarious position. As one cause of want after another, industrial accident,

old age, sickness, unemployment, have come under the care of the public, the need to insure oneself by having children has faded out. Not only were parents of large families in fact better placed to face the vicissitudes of life, but also were seen to be, and thus became objects of envy to their neighbours. Now so much is the situation changed that they have become objects of pity and even sometimes, it is to be feared, of contempt, for being simpletons.

17. The argument that "social security" is a cause of infertility is not designed to cast any slur upon social security. On the contrary, the case for that reform is unshakable and it would be a slur on any nation, which had achieved the general standard of living of our own, if it did not provide in full measure for the needy. After all, insurance by having children was a rough and ready method which left those who could not have large families in an exposed position. We have reached a level of well-being at which we must regard such a method as intolerable. But the point is that if one introduces a very far-reaching change (like social security) in the balance of forces which maintain society in being, one must be on the look-out for the necessity of compensating changes. The physiologist well knows what a delicate balance of forces is the human organism ; the ecologist understands the intimate inter-connexion of animal life, plant life, methods of cultivation and the water-table and that a disturbance in the balance may have most far-reaching consequences ; it would be foolish to suppose that the balance of forces in the social organism is any less delicate, but unhappily sociology has not yet found its feet as a scientific study. Still, we may venture as far as the elementary proposition that if the primary self-regarding motive for having children is removed, there is danger to survival if a substitute is not found.

18. In touching on the causes of the fall in reproduction, I have confined myself to two points, one negative and one positive, which seem to bear directly on the plan which I have to submit. The general question of the causation is a vast subject and to enter on it would prolong this introduction beyond reasonable limits. But while I have not referred to numerous other casual factors, it must not be supposed that I have not had them in mind nor given them weight in considering remedies.

SPIRITUAL VERSUS MATERIAL REMEDY

19. The question is sometimes raised whether we should put more emphasis on a spiritual remedy or a material remedy for the present state of affairs. Those who stress the spiritual side sometimes argue that without a prior change of heart the material remedy will be of no avail and therefore should not be pursued or at least should be postponed until we see the effect of a spiritual change. I do not share this conclusion for the following reasons. In the first place the intrinsic desire for children must be so deeply-rooted in the constitution of our species and has played such an important role through countless vicissitudes, that it must surely be regarded as an abiding element. Some hold that the fall in reproduction is due to the growth of selfishness and the decline of parental love. On biological principles it is most unlikely that there has been a loss of strength in the fundamental parental instincts in the last two generations. Self-righteous persons in every age have railed against the growth of selfishness in their own ; but their testimony is unreliable and taken in the aggregate self-contradictory. The fall in reproduction may be accounted for by the great changes in the environment which have occurred, and there is no need to resort to the improbable hypothesis of a change in human nature. But if it is needlessly cynical to suppose a decline in parental love, it is unscientifically optimistic to imagine

that it can be whipped up above its normal level by spiritual exhortation. Parental love is a force of great but not infinite potency. If excessive material obstacles are put in its way it may be overcome. What we need, to secure survival, is that parental love and more self-regarding motives should work together in harmony to encourage parenthood, as they have done in the past. It is wrong to put too much strain on the altruistic elements in human nature ; society should be so arranged that self-regarding motives play some part in getting fulfilment of the two basic tasks of doing an honest job of work for society and providing the next generation. The better that is arranged, the more can the fund of altruism be released for works of supererogation, kindness to the needy and suffering, the pursuit of new ideas and new adventures, and all the other good works on which we depend for the progressive amelioration and refinement of the human race.

20. Secondly even if a spiritual aufklärung were capable of having a marked effect on reproduction, it would not be within the power of the public authority to bring it about. Official propaganda would be of little use: indeed it is probable that most British citizens would greatly resent any official exhortation on these very personal matters. It is true that a man of genius, a Dickens or a Mr. H. G. Wells, may have a profound influence on the way in which people regard their own private affairs, and their attitude to life. But we do not know if there are such men of genius among the coming generation and it is most unlikely that, if there are, they would be willing to employ that genius to a given purpose on an official suggestion.

21. Thirdly, I suggest that far the most effective method open to the state to bring about a spiritual change is by applying a material remedy. The average citizen will not be impressed by propaganda, but he will be impressed by action. If a Royal Commission recommended and a British Parliament enacted a far-reaching measure to provide a basis for family life, that would be an event likely to strike the imagination. It would lead to heart searching and intimate discussion. Once serious thought is provoked, we may rely on the conscience and reason of each individual to secure some revision of our scale of values. Whatever his religious convictions or moral code, the case for handing on the torch is so strong that he will recognize it, if he has any principles at all. I submit that the natural order of events is as follows. Public discussion, such as is now taking place, is necessary to get sufficient public opinion behind a Parliamentary measure ; but this discussion is likely to have little influence on private conduct. The primary purpose of the measure must be to provide a material remedy, but if the measure provokes thought at a deeper level it may have some influence on the individual's notion of his duty. Whether this spiritual bye-product will be important or not, it is difficult to judge. I submit that it is the only way in which the state could bring about a spiritual change, and, if this is so, it means that the need for a change of heart reinforces the case for early Parliamentary action on the material plane.

PROPOSAL

22. I am only submitting one main economic remedy. Action on a number of subsidiary lines—e.g. housing, household appliances, domestic help, town-planning—is also desirable and I shall make brief reference to them later in this introductory note. But I do not think that all these measures added together would be either adequate in scale or likely to produce the moral impression referred to in the last paragraph. At the centre of the array of measures we need a straightforward provision of family endowment.

(i) *Universal endowment at flat rate*

23. I propose an endowment to be paid to all out of public funds, to consist of a flat rate for every child after the first. I do not intend to argue in favour of this, assuming that it is already widely accepted. Sir William Beveridge, having regard to what is necessary to stave off want, proposed 8s. a week for each child after the first. In considering the population problem we are more concerned with giving an adequate status to motherhood and securing that the mother's condition is not too much less eligible than that of the unmarried woman worker. From this point of view I should prefer 10s. as a minimum. On such a scale a mother with three or four children in addition to the first and her husband contributing his fair share to the household expenses might not be far below the unmarried worker in her standard of living. But in the scales set out in my " submission " I have assumed 8s. not 10s., so as to secure my results without imposing a greater strain on public funds than that proposed by Sir William Beveridge.

(ii) *Compulsory insurance for incomes over £250*

24. Compulsory insurance payments should be charged on all incomes in excess of £250 p.a. at the rate of 1s. per £ of income with a maximum contribution of £50 p.a. I propose that the endowment payable in respect of children should be in proportion to contributions in such wise that a man of average life and with an average number of children in excess of 1 (reckoning the second as a half: cp. next sentence) would receive an amount precisely equal to what he paid in contributions (the details are explained in the " submission "). I propose that a full rate of endowment be paid in respect of every child after the second and a half rate be paid for the second. I propose that this endowment should be supplementary to the flat rate of allowances proposed in the last paragraph.

Adequate in scale

25. Is this adequate in scale? When we consider the great variations of economic system revealed by the anthropologist and the economic historian and the catastrophic nature of the recent fall in reproduction, we may think ourselves lucky if we can secure survival by such a modest impost as 1s. in the £. The case rests on the table given in the submission which shows what endowments could be provided. I think they would strike the average man as a reasonable assistance to parenthood and as sufficient to influence the decision of parents doubtful of their financial ability to add to their family. The matter could only be tested by experience. If the endowment proved insufficient the scale of contributions and endowments could be raised within the framework of the scheme.

National in scope

26. I submit that only by compulsory insurance is it possible to have an acceptable plan that is *national in scope*. The purpose of the plan is to reduce the disparity between the living conditions of larger families and those of smaller families (including childless persons). Since incomes are unequal a flat rate of endowment which might go some way to reducing the disparity of those with incomes below, say, £250 p.a. would do much less to reduce disparities among those substantially above £250 p.a. No flat rate can have an appreciable effect that is national in scope. Endowments must be proportional to income. But Parliament is unlikely to be willing to vote such proportional endowments out of public funds. The future incidence of the burden would depend on the varying public policy in regard to taxation and

it could be represented that such parliamentary endowment might in certain circumstances involve a transfer from the poor to the rich. It is most important that a national scheme to encourage larger families should be neutral as between different income grades, professions, trades, etc.; it should be equally effective whether we proceed far on the road to greater equality of incomes or not; it should not raise party or class conflicts. Under my scheme what the class of people with incomes of £400 a year get, over and above the flat rate available for all, is paid by the class of people with £400 p.a.; similarly in the case of those with £500 p.a., £600 p.a., etc. Each income grade is self-financing. There is no question of one grade financing another, no interference with the income structure as it is at present or as it may be subsequently re-shaped. It neither aids nor hinders any re-shaping of the structure that may be desired.

Case for imposing a limit of £1,000 p.a.

27. I propose that no one should pay a contribution in excess of £50 and that endowments to parents with more than £1,000 a year should not exceed those to parents with £1,000 a year. £1,000 is of course an arbitrary figure and some other figure may be preferred. There are two arguments in favour of this proposal. (i) While for a wide range of incomes the amount of money which parents feel it incumbent on them to spend on their children rises (for reasons stated in para. 34 below) roughly in proportion to the income of the parents, this rise does not proceed without limit. Very rich people are not likely to spend as large a fraction of their income on their children as those in the moderate range. I submit for consideration that the endowment shown in the Table for a man with £1,000 a year would be sufficient to constitute a reasonable offset to the expenses incurred in respect of children by richer people, that, if money was the consideration holding richer parents back from adding to their family, the endowment proposed would suffice to remove that deterrent, and that, consequently, the limit of £1,000 may be accepted without infringing the principle that the scheme must be *national in scope*.

28. (ii) While there is no question, under my insurance proposals, of the public financing the endowment of richer parents and each income group finances its own endowment, those keenly wedded to the egalitarian principle might object even to taking that indirect official cognisance of the existence of larger incomes which a compulsory insurance scheme enforcing proportionate family endowment might be deemed to imply. By fixing the limit of £1,000 such a scruple may be overcome. Remembering that the endowment project is an urgent one, which must bear fruit in the next thirty years, if the population is to be saved, we have to consider the social structure that is likely to prevail in that period. As I understand it, the British Labour Party would not wish to narrow the range of incomes more closely than from £250 p.a. to £1,000 p.a. in the immediate future. It is doubtful if even Communists are intolerant of such a range. Consequently, taking a hypothesis most favourable to the wishes of egalitarians, that a Parliament was elected after the war prepared to take immediate action to secure a radical redistribution of incomes, narrowing the range of incomes to £250-£1,000 p.a., my proposal would still be necessary if the endowment scheme was to be national in scope.

Income Tax reliefs cannot be a solution

29. The question has been canvassed whether endowment could be provided by extending the existing system of Income Tax reliefs in respect of children. I have examined this carefully and regretfully conclude that an adequate endowment could not be provided by this method. The main point

is that there is no escape from the dilemma that *either* the amount yielded by the relief will be quite inadequate in scale, as at present, *or* only rich parents will get any benefit at all in respect of the later children. As one enlarges the amount of relief per child, one raises the level of income at which there is any relief in respect of the third, fourth and fifth etc. children. This result would be true even with Income Tax as it is at present. In making calculations one should, however, assume some amelioration. For example, one might take (pessimistically) the standard rate at 7s. 6d., £160 personal allowance for a married man, £165 at half rate and an earned income allowance of one fifth. An allowance per child of £100 instead of the present £50 would only provide £37 10s. a year, an inadequate amount; it would be necessary to have more than £575 a year to get any relief at all for the fourth child and to have £906 5s. a year to get the full relief of £37 10s. To make the allowance more adequate one might increase the relief per child to £200; but then a man would have to have more than £950 p.a. to get any relief for the fourth child and he would have to have £1,406 5s. a year to get the full relief. He would have to have £1,656 5s. a year to get the full relief for a fifth child. Not a very democratic system! The fact of the matter is that to make a substantial reduction of the present disparity it is necessary that the endowment for parents with a family of four or five children should be more than they are likely, unless rich, to pay in income tax; consequently Parliament would not only have to relieve a man of all his income tax but to vote positive sums in payment to him; and this, for reasons already stated, it is not likely to be willing to do on a proportional scale to persons with middling incomes.

Insurance system especially suitable

30. The same cause that makes the Income Tax relief method an unsuitable one for dealing with this problem makes it especially eligible for the Insurance method. The burden of a large dependent family is heavy, but it only lasts for a comparatively small period in a man's whole earning life. Consequently the premiums may be spread and the endowment concentrated; this enables the latter to be generous by comparison with the former; it is in relation to such a pattern of events that insurance has always had greatest success.

Need for compulsion

31. There is one feature of this proposal, however, which is uncharacteristic of insurance. A man would have to continue to pay contributions after ceasing to have any expectation of drawing benefits from the scheme. This is one reason why the insurance should be compulsory. A voluntary organization would find collection excessively difficult in those circumstances. My proposal is that a man should be liable to pay contributions until his sixty-sixth birthday. This extension of the liability beyond the normal age of reproduction is necessary to get a good spread, it is equitable and it is also necessary to avoid discouraging early marriage. If an endowment fund had to be accumulated in advance of fatherly responsibilities, young men would have to contribute not one but many shillings in the pound at a time when their incomes were still slender. And in order to get a good endowment they would have to postpone fatherhood; this would be inimical to an increase in reproduction. Another reason for compulsion is to get the necessary spread of numbers contributing. A man should certainly be free from all pressure to become a father, if he does not wish to (see also para. 51 below); but he should not be free to opt out of making his contribution to the costs of raising the next generation.

PROPORTIONAL ENDOWMENT NOT UNDEMOCRATIC

Preamble

32. After these preliminary remarks I should have preferred to present my scheme and let it speak for itself. I am conscious, however, of a class of objections that may be raised and ought to be forestalled. They turn on the idea that a proportionate endowment might offend the egalitarian sentiment of the present age. I hope that not much weight will be attached to this. I have subjected myself to cross-examination in many audiences containing all types and classes of people and this type of objection was seldom raised in the body of the hall. It seems to come from a minority whose interest in these questions is doctrinaire rather than practical.

Summary statement of objections

33. The objections to be met may be classified as follows:—

(i) Parents with larger incomes ought not to spend more on their children; their problem should be met on the lines of enabling them to dispense with such expenditure.

(ii) If, none the less, these parents refuse to have more children unless they can afford to give them extra amenities, we should neglect this class altogether and rely exclusively on those with modest means, since their numbers are sufficient to secure the survival of the race.

(iii) Proportionate endowment is inconsistent with the idea of equal opportunity, involves perpetuating the inequality of the social structure and is therefore inadmissible.

(i) *Expense of children for middling incomes necessarily higher*

34. Too much stress is often laid on the cost of schooling. This is a vast subject on which I do not propose to enter. But I submit that *quite apart from this cost* the expense of children is within a certain range proportional to income. One has only to examine how a man with £500 or £1,000 a year spends his additional money compared with a man with £250 per annum. A few of the obvious items are size of house, location of house, domestic help, a car, holidays, recreations, books, pictures and other cultural amenities. Under each and every head there is a corresponding item for the children. The two-seater must be replaced by the family car, the small house by a larger house. Of course a man may seek a larger house in a cheaper neighbourhood, but this would mean introducing that very disparity between his own circumstances and those of a man with the same pay doing exactly the same professional service for the community that we wish to avoid. What is not possible is to arrange for the man to enjoy the same amenities as his colleague himself while spending no more than one of lower income on his children—not possible at least on lines which British citizens would tolerate. Of course it would be possible to regard the home as a mere breeding ground and hand the children over to state institutions which would do the rest, treating all children as equal. Such a solution is entirely unacceptable. So long as parents are allowed to have unequal incomes (within a certain range) they will want, and it is right that they should want, to share the resulting amenities with their children. The idea that the father should have one standard of living for himself and a much lower one for his children (so as to secure equal opportunity for all) is atrocious. It would not be endorsed by any section of the British public, whatever its aspirations for a new social order. That order must be achieved by some other method than the gross callousness and selfishness of parents and a break-up of the united life of family homes. It is not possible to solve the problem on the lines of dispensing parents with larger incomes from the need to spend proportionately more money on their children.

(ii) *Middling income groups must not be allowed to be relatively infertile*

35. The critic might grant that we cannot and ought not to prevent better-to-do parents from sharing their amenities with their children, but argue that, this being so, we must acquiesce in their having smaller families, leaving it to the group with £250 p.a., or less, which is in a numerical majority, to increase their families and secure race survival. There are three weighty arguments, each alone strong enough to rule this solution out of court. (*a*) It will lead to race decline if our better stocks are relatively infertile (argument from stock). (*b*) It will lead to a general lowering of standards and of efficiency if the parents who are best equipped in experience, knowledge and culture are relatively infertile (argument from environment). (*c*) If members of the community doing relatively more responsible work—scientists, statesmen, administrators, doctors, technicians, business managers, foremen, teachers, etc.—do not decide to have larger families, the other members of the community will not do so either (argument from social example). I will expand each of these in turn briefly.

(a) *Argument from Stock*

36. The argument from stock is supposed to be controversial. Not that there is any reasonable doubt that valuable qualities are hereditary or that the various families which compose the nation possess these qualities in unequal measure. Where the doubt comes in is as to whether the families who at present enjoy a relatively favoured position do in fact embody the best qualities, some arguing that they owe their position to feudal pillage or capitalist exploitation in the past. This is an extreme view. Not many British people are so Marxist in outlook as to deny virtue to the middle class families who in the nineteenth century—to go back no further—have made such immense contributions in science, industry, commerce and statesmanship and have left us the permanent possession of their poetry and novels. Not many would argue that their anti-social qualities, which no doubt they had, outweighed their contribution to progress which has made possible the higher standards of living that all now enjoy. Not many would think it a good thing that the progeny of these people should fade out altogether. But it is not necessary to our purpose to engage in this controversy. We must think of the future. Our society is becoming more fluid and democratic and we are planning to accelerate this tendency. The idea of equal opportunity is that the individuals who, whatever their birth, have ability and valuable social qualities, should be able to rise and occupy positions of responsibility, not only those at the very top, but all down the scale. That is the plan for the future ; what happened in the past is irrelevant. Then it becomes of vital importance that the people in such positions should not be sterilized. It is planned in each generation to comb out of all classes and sections of the nation the best endowed individuals and give them work commensurate with their capacities. If in each generation these same individuals are sterilized, it is obvious that very soon all that is best in the nation will be lost. The national sponge will be squeezed dry of all ability and the precious fluid thrown down the sink. In fine, the more flexible our society, the better we realize the ideal of equal opportunity, the broader we make our educational ladders, the more important it is to have proportional family endowment. This is the argument from stock ; so far from implying any favour to privilege and status, it only obtains its maximum strength in a fully democratic system. Family endowment is a corollary of equal opportunity and if we neglect it we may expect a rapid decadence in the innate qualities of our race.

(b) *Argument from environment*

37. The argument from environment is more popular but not always well based. It strikes the ordinary man as hard on the next generation that the more comfortable home should be comparatively empty while children abound in homes where means are scanty. This is a natural humane view, attaching importance to the amenities which the more affluent homes provide. It has an element of truth, although it is doubtful if these amenities contribute much in the long run to the good citizen. There is a much more important aspect. It is the question of education, not in the sense of schooling, but of education in the home. Civilisation consists in an accumulation of wisdom, knowledge and culture. We wish to diffuse this as widely as possible. But it is inevitable that the actual people who are plying the arts and sciences or occupying responsible positions, involving experience and skill in human relations, should be in a special sense the repositories of our accumulated wisdom, knowledge and culture. This is quite independent of the economic system and would be as true under communism as under free enterprise. These people are not and cannot be schoolmasters. The main channel by which the accumulation can be handed down is education in the home. Otherwise it will be lost and we shall deteriorate. The accumulation is not a corpus of doctrine which can be written down or imparted in a class room ; its continued life depends on the sustenance provided by the actual experience of the people who are playing their various parts, exalted or comparatively humble, in the community. It is imparted by parents to children not in instruction but by hints and examples thrown out in the ordinary course of family life over a term of years. This home education is valuable not only for the doctrines and maxims imparted but also as a preparation for schooling. It is a natural and healthy instinct for children to hate their lessons ; but if they do so they will fail, even if they pass certain examinations, to get full value from them. Home education prepares them to be receptive ; it is often only when the school lesson gets linked up in the mind of the pupil with some line of thought which has been started in his home, and is therefore connected with his *amour propre*, that his interest is engaged and his real education begun. By exception, no doubt, a boy of genius may owe nothing to his home. For a greater number the background of home culture is a valuable fertiliser. The conclusion is that, if our standards are to be maintained, those who by reason of their actual vocation in life are in a special sense the repositories of current wisdom and culture should contribute at least their fair share of children to the next generation.

(c) *Argument from social example*

38. Finally I submit that the proposed solution (leaving it to the lower income groups to do the main part of the breeding) just will not work. The habit of the small family has spread from the more affluent groups to the main body of the population by social example. We are not likely to get a revival by the reverse process. I do not know if the manual workers, who undertake heavy drudgery for the community, would regard it as a compliment to be asked also to take on the main part of having and rearing the next generation. There is something fantastical in the idea. It must be remembered that our whole social structure is graded from top to bottom not only by income—those differences could in principle be ironed out—but also by the responsibility and intrinsic importance and social prestige of the jobs undertaken by the various members. The example of those one grade higher in responsibility or prestige, whether they be objects of respect, admiration or malicious envy, is bound to carry weight. They are the relatively successful people, they have more freedom of action and they are presumed to know

what is what. If they for the most part think a very small family the right and proper thing, this will impress the minds of those less fortunate. This is a matter in which women have some say ; and they are notoriously influenced by fashion. This is no reflexion upon them ; they have their own part to play in guarding the fortunes of the family and their secret wisdom makes them wary of taking action which will bring upon the family some measure of social contempt. There was a time when it appeared that the main mass of people might resist the example of the small family ; they have not done so. It is one thing to resist a new habit which violates inherited standards ; it is quite another to embark on a new line of action, contrary to the direction of social example. I conclude that family allowances which have no effect on the size of the families of parents with incomes over £250 p.a. will have little effect on the size of families at all.

(iii) *Equal opportunity does not mean starting fresh in each generation*

39. Forced to admit that better-to-do parents will not and ought not to be asked to have one standard for themselves and a lower one for their children, that with the present financial arrangements these will confine themselves to small families, that the sterilization of higher income groups will lead to decadence in a fluid society and that if these groups maintain the habit of small families, we are not likely to get a revival elsewhere, the critic might still entrench himself in the position that proportionate endowment was inadmissible, because it perpetuated the existing inequalities. He would argue that this principle is clear while the alleged consequences are only conjectural. I submit that this implies much too narrow a view of equality of opportunity, which would not be endorsed by the majority. There is widespread discontent with the system by which certain families can maintain a favoured position generation after generation whether they contribute anything valuable to the community or not. This does not mean that we have to go to the opposite extreme and line all children up on a touch line so that they can start the race from the same place. This is altogether too atomistic a view of social process ; it is doctrinaire and would not be widely supported. The fact is that it takes more than one generation to equip a man for the more responsible positions. A man of exceptional genius, the occasional freak of nature, may, it is true, make the whole way himself. The experience and wisdom that are necessary for many positions are more than can be acquired by most people, able and talented though they be, in a single life-time. This is a matter of the commonest experience. How many there are, who have done valuable work, with the sense that they could have done much more, it only they had had a better start, not in the form of more algebra at school, but more wisdom and guidance. This difficulty of crowding enough lessons into one lifetime cannot be overcome by altering our social system, because one cannot make the social system simpler. On the contrary, it becomes ever more complicated and is likely to continue to do so. We cannot provide citizens capable of coping with it, if we seek to expunge the wisdom acquired by one generation from the consciousness of the next. We cannot afford to have our society run by half-baked people. There must be some continuity of experience. Therefore the atomistic idea of making all children start life with identical advantages is unpractical. There must be equal opportunity ; but interpretation of this principle must not be narrowed down to the life of a single generation.

40. There is another point of view from which such an atomistic arrangement may be seen to be undesirable. Socially it is in the interest of society that the best use should be made of the talents and capacities of all her members. To this end the individual must co-operate. Full realization of

a man's gifts cannot be achieved without some sacrifice of comfort and the common pleasures of life, even of the claims of friendship and domesticity. These counter-claims are healthy and will always make a strong appeal to the majority, including men of ability. Against them society has to offer the inducements of prestige, power and monetary reward. Hitherto we have had an inducement to exertion, which in the case of the normal individual is probably stronger than any of these, the desire to give one's children a good start in life. If it ever happened that under the influence of a doctrinaire interpretation of equal opportunity we removed this inducement, only the selfish inducements would remain. Only vulgar careerists would be candidates for positions of responsibility. This would not only be displeasing in itself, but would involve evil social consequences. The purely egoistic man is not likely to discharge his duties in the best social interest. Then would indeed be realized that régime of ruthless self-seeking which extreme Marxists have unkindly attributed to the bourgeois civilizations of the past. There is truth in the wisdom of Confucius that only a good father can make a good states-man. The dictum applies, of course, not only to the great positions of state, but to the small entrepreneur, the foreman, in fact, to all the minor positions of responsibility. We must apply the dictum of equal opportunity so as not to prevent a man from creating by his exertions a favourable setting for his family in the next generation. What is required by the dictum is that the favoured position should not continue for more than two or three generations save in return for good services rendered. From this point of view it might be desirable to consider reducing death duties on money passing for the first time, while applying progressive rates of tax, on the lines of the well-known proposals of Rignano, rising perhaps to 100 per cent., on money passing for the second, third and fourth times.

41. By great confusion of thought, it is sometimes argued that family endowment would weaken what may be called the dynastic motive for exertion. This might be true in circumstances in which birth control (in the widest sense of that expression) was altogether impossible; the number of children being an unalterable datum in a man's situation, he would be driven to work to provide them with necessities and any external assistance would enable him to relax. But if the size of the family can be adjusted at will, this argument does not apply. Family endowment does not in any way interfere with the system by which the more a man betters his position the more he can give his children. Paras. 34-41 of this note have been composed to rebut the objections set out in para. 33.

POSITION OF WOMEN

Two special problems regarding women

42. Before concluding this note, I wish to make a few observations on the position of women, which must obviously be carefully considered in any problem connected with population; I wish to refer to two matters in particular, namely, (i) domestic help and (ii) the status of women who rise high on the educational ladder.

(i) Domestic help

43. The relative rise in the price of domestic help compared with other purchasable goods and services may be one of the causes—I have not attempted to explore the broad field of causation in this note—of the decline in births. This relative rise is the natural consequence of the increased pro-ductivity of labour in the general field. In that field wages rise roughly in

proportion to the increase in output per head, but the price the consumer has to pay does not rise because the higher wage is offset by the reduced quantity of labour that is required per unit of output. Wages for domestic help also rise in proportion to the general increase in labour productivity owing to the competition of the wages offered in other occupations ; but in the case of domestic help there is no offsetting factor corresponding to the increased output per unit of labour employed. Naturally as all or most other purchasable conveniences become relatively cheaper consumers tend to direct their expenditure to them. Fifty years ago few would have thought of having a carriage who did not have four or five domestic servants ; now many who have no full-time domestic servant run a car. This means a relative decline in the amenities of the home ; and the decline in the birthrate is a bye-product.

44. Domestic help must not only be thought of in relation to the well-to-do. It should be available to mothers of all income grades. No woman should be expected to keep the house decent and at the same time look after four or five children. That is a corollary of our higher standard of living (due to the higher productivity of labour) and the wider diffusion of education. The creche may be of some service, for instance, to release mothers from the home in the evening, but any development of this kind should be encouraged with extreme caution, since it is desirable to make the home itself the main centre of interests and pleasures during the period when children are young. In the case of parents with more than £250 it is a public interest they should spend as much as possible of this on domestic help ; the more that is so spent, the more the home becomes the centre of gravity in life. All means should be explored for securing that good value is received for money so spent.

45. Of primary importance is the status of domestic service. If the status is bad, employers have to pay not only in proportion to the labour involved in the task but something extra as an inducement to enter an unfashionable occupation. Domestic service ought to rank above factory work, shop assistance, service in restaurants or typewriting. How can this revolution of ideas be achieved? Public recognition might be given to the status involved, for instance, by diplomas in domestic science available for all who do certain courses before leaving school. There might be a financial inducement, e.g., by the granting of additional public pension rights (not available in respect of the employments referred to above) per year spent in domestic service. Even more important probably is a regulation and clarification of the duties involved. It is the suspicion that behind the four walls of a house the servant may be ordered about in an arbitrary way, be humiliated, partake in unsavoury scenes and live in squalid conditions that lowers her prestige in the eyes of her acquaintances. From many points of view it might seem a pity to introduce Trade Union rules into an occupation where relations between employer and employed are so personal. On balance, it would, however, probably be an advantage to do so. It is certainly an occupation in which the bad employer is prominent. Bad conditions in a number of cases lower the status of the whole occupation. The badness may more often be due not to malice or oppressiveness but to lack of experience in handling and lack of clarity as to mutual rights and duties. Inherently the occupation has attractions. The work is diversified and skilled and by comparison with similarly or better paid occupations interesting. It should be possible to eliminate the frictions which make the occupation unpopular and the employer ill-satisfied with the results of his outlay, by giving the service a status which would ensure mutual respect, and by defining duties with some precision. As in the case of the domestic industries, it is difficult for a

Trade Union to grow naturally, and it may be desirable to start with a Trade Board which would encourage the foundation of a Union and then be wound up or not as the circumstances suggested.

Domestic help—sleeping in

46. There has for some time been a tendency towards the system of sleeping out. But from the point of view of employers getting the best value for money, this is not good. Owing to the spread of overheads the employer can provide lodging, board, light, heat, etc., at a smaller cash cost than would be required to bring the wages of the employee up to a level to provide all these things for herself. Here again a code of standard rules might revive the popularity of a sleeping in job. Thus, for instance, a latch key should be accorded as a matter of course and no instructions to be in by such and such a time should be allowed. Subject to the efficient discharge of recognised duties the employer should feel no more entitled to supervise the private life of the domestic servant than would a manager in charge of factory workers. The servant should have the right to receive one or two guests (without interrogation by the mistress) outside the standard working hours. She should be emancipated from the caprices of her mistress, whether due to misguided benevolence or an interfering temperament. To many these points may seem obvious ; but the prestige of the occupation is injured by the less enlightened employers.

Domestic help—possibility of subsidy

47. Finally the possibility should be considered of a subsidy from public funds. Some years ago this idea might have seemed fantastical ; in the interval there have been deep heartsearchings, old values have been discredited and people are ready for new ideas. In quite another sphere of thought, the idea of using subsidies to maintain certain industries or to provide additional employment is no longer taboo. Once it is recognised that there are few women and will soon, with rising standards, be no women willing to look after three or four children and do all the housework without help, domestic service becomes the most vital occupation there is, since without it survival is impossible. To some the maintenance of the fertility of our soil seems a proper charge upon the tax-payer ; but by comparison with the maintenance of a stock of live human beings, the agricultural objective is clearly of trivial importance. Domestic help may without exaggeration be regarded as the industry which produces the nation itself. Again, from quite another point of view, this occupation is particularly worthy of support in any plan to provide full employment ; employment is given and the consumer enjoys the benefit without the necessity of any additional import of raw materials, and the whole of the money provided by the public goes into the pocket of the employee without any profit rake-off. The subsidy should be available in the case of an employer with more than two dependent children towards the wages of one full-time employee, or, alternatively towards those of a number of part-time employees. It might be objected that the family endowment should be sufficient to cover this charge, the parents being free to lay the money out according to their own estimate of needs. There is force in this objection, and I submit that we should generally eschew all plans for paying part of the endowment in kind as leading to a servile state. Only if subsidies are to be provided anyhow out of public funds for the purpose of raising the quantity of employment, then domestic service should be first on the priority list. As a means of attracting labour into the domestic service market, a public subsidy might have some advantage over the use by individuals of their endowments to attract such labour, because the public recognition, implicit in such a subsidy, that this occupation is of essential national importance might help to raise its status.

Domestic help—household appliances

48. Domestic help should be regarded as complementary, not alternative, to the provision of modern labour-saving devices in all homes. Modern gadgets are essential not only to assist the housewife herself, but also to raise the status of domestic help. A home must be mechanised like the factory, if the occupation is to be regarded as a clean and attractive one. Again we may bring in an argument from another sphere of thought to reinforce this conclusion. A central economic problem is to find sufficient investment opportunity to utilise British savings at their high current level and thus avert unemployment. An increase of consumers' durable goods financed by the instalment purchase system may be an important contribution. This is a perfectly logical and natural development of our existing system ; hitherto savings have been largely used to provide producers' capital goods, but when they become redundant for this purpose, what more reasonable than that the money which one lot of people are setting aside for life insurance, company reserves, etc., should be used by others to buy durable consumers' goods in advance of their ability to pay for them? The system is perfectly sound provided that the aggregate amount of outstanding indebtedness on instalment purchase account grows at a moderate and steady rate. The convergence of two arguments, drawn respectively from the two most important domestic national problems, the population problem and the employment problem, upon the desirability of increasing labour-saving devices in the home, surely provides a reason for the state to take some interest in the matter. Unlike many spheres in which "planning" is recommended, the objectives—rearrangement of the social system in a sense favourable to reproduction and a balance between the aggregate supply and demand of savings—are beyond the powers of private initiative to achieve. I suggest three lines along which the state might give assistance: (i) arrangement for the provision of credit for instalment purchase at rates within a narrow margin of the gilt-edged rate of interest, (ii) a system for the regular reduction of instalment payments during periods when the purchaser qualified, by reason of inability to earn, for social security benefits, and (iii) arrangement for the supply of "utility" gadgets at prices equal to cost plus profit, thereby breaking price-rings or prices held at an enhanced level by the exploitation of patents.

(ii) *Highly educated women*

49. Many women now seek a college education, often with a view to pursuing occupations in life for which this education qualifies them. While it must be recognised that there is a minority of women temperamentally unfitted for family life many of whom are highly qualified to do most valuable work as spinsters, it would be most undesirable if the majority of women who go to college were deflected from the tasks of motherhood. To some extent already they comprise the most gifted women in the nation and will come to do so more, as the educational ladder is broadened. The arguments from stock and environment (paras. 36 and 37) alike require that these women should in due course become mothers. Already on average they have to make a sacrifice in their standard of living to do so. The position will be worse if the system of "equal pay" is more widely adopted. Although this system may displace some women from their occupations, for others, presumably the more gifted, the sacrifice entailed by renouncing their profession in favour of motherhood will be still greater. It is feared that the scheme which I have the honour to submit would not completely redress the balance. As a further easement I suggest that in organized professions, opportunities should be given to women to return later in life. For instance, a young woman, having begun a career as a teacher, might get married after

four or five years. Then after she had spent some twenty years on family duties, it should be open to her to return, say in the late forties, with suitable increments of pay and status. This project might wean away some who love their professional work and are reluctant to leave it, and at the same time might improve the lives of older women, who are apt to feel that, with their children already adolescent, the world has no more use for them. Although they would lack the experience of what we hope would be a minority who remained in the profession, they would have gained another kind of experience perhaps not less valuable. Refresher courses could be provided. It should be assured that these women during the course of the period they devote to their own children have sufficient leisure to carry on the education begun at college.

50. This brings us to an important dilemma. On the one hand it is essential that the majority of gifted women should go through a period in which they devote themselves to bringing up their families. On the other, it is now established, with justice, that the educational ladder is to be open to women. But education is only begun at college ; it is continued through life. In the case of the man, his own work in science, the arts or a position of responsibility involving intricate social relations is often itself educative and it is organized in a way which allows him some leisure for further reading and study. But it must be confessed that the woman who devotes herself from morning till night to housework and children may fail to continue the process of education altogether. In that case her spell at college may have been a mere waste of time, absorbing part of our severely limited supply of teaching capacity for no good purpose either for the woman herself or the the community. With our ambitious plans for extending education we cannot afford such a waste of teaching resources. Consequently it should be clearly recognised that the lives of the majority of women, who have shown themselves worthy of a college education but afterwards devote themselves, as we wish they should, to motherhood, ought to have sufficient leisure for them to continue to improve their minds. This brings us back to the problem of domestic help. No woman, who has had the benefit of a higher education, should feel it her duty to devote the whole day to household work. On the contrary it is a prior duty to continue to cultivate her mind, and so justify the expenditure of precious national resources on her higher education. This self-regarding insistence on her own culture will be of value to the community if she returns to a profession ; part-time work (e.g. three or four mornings or afternoons a week) should also be made available in the organised professions like teaching. But there is a still more important way in which this extended culture may bear fruit. In para. 37, stress was laid on the vital importance of home education if national standards are not to deteriorate ; the mother can play a valuable part in this, if she keeps her mind active by continuing the education begun at college. Thus her own college education which launched her on the journey to higher things may find its chief outward effect in enabling her to give the minds of her children that fertilization without which they are likely to derive little advantage from their own schooling. This is another illustration of the continuity through generations of the social process and the falsity of the atomistic theory that each generation can start from scratch.

INDIVIDUALS TEMPERAMENTALLY UNSUITED TO FAMILY LIFE

51. Reference was made in paragraph 49 to the minority of women whose true vocation in life may be altogether outside family duties. There are men also, who are temperamentally unfitted for family life. These kinds of people, both men and women, are often especially gifted and of exceptional

value to the community. It is important that they should not be harried by the movement of public opinion in favour of family responsibilities. Let each do according to his capacities. If those who do love children were relieved from pressure and enabled to have as many as they would ideally wish, it is probable that the population could be maintained without forcing into service those to whom it is temperamentally uncongenial. Our community will only prosper if the fullest toleration is shown to the diversity of types. The solution of our problem is to make parenthood less burdensome, not to dragoon unwilling citizens into parenthood. If the insurance scheme is adequate a man (or woman) will have done his duty to society when he pays his contribution ; the fund will enable child lovers to do their part in grateful willingness.

PRESENT STATE OF PUBLIC OPINION

52. I venture to surmise that the attitude of public opinion to proposals for family endowment is as follows : —

    i. The public is still in some doubt whether the alleged population crisis is real or a scare raised by statistical faddists.

    ii. It is likely to be convinced by an announcement by a Royal Commission that the danger is real.

    iii. When so convinced, it will certainly desire a remedy that is adequate in scale and national in scope.

    iv. The average man is not likely to regard 1s. in the £ as a disproportionately large contribution ; on the contrary he would probably regard a smaller sum as indicating unwillingness to face up to the problem. I propose that this insurance scheme should be supplementary to the flat rate of 8s. for every child after the first, as proposed by Sir William Beveridge.

SUBMISSION

1. There should be a compulsory insurance contribution of one shilling in the pound on all incomes in excess of £250 p.a.

2. The maximum contribution should be £50 p.a., which would be due on an income of £1,000 p.a. All persons with incomes in excess of £1,000 p.a. should be treated as though their income were £1,000 p.a.

3. In the case of persons with incomes in excess of £250, the first £250 of their income should not be exempted from contribution. If such exemption were allowed, it would not be possible to provide adequate endowment for incomes much below £1,000. But to prevent individuals suffering loss on increments of income immediately above £250, the contribution should be tapered from, say, one farthing in the pound on £251, one halfpenny in the pound on £252, etc., to one shilling in the pound on £298.

4. The contribution should be payable by all income receivers between their twenty-first and sixty-sixth birthdays.

5. For the purpose of establishing the contribution, the income of husband and wife should be aggregated, but during the period from the end of the first year of marriage to the end of the twenty-first the earned income of the wife should be treated separately if it exceeds £250 p.a. The aggregation is necessary in equity since the endowment will be scaled, for reasons stated in para. 14 below, to the income of the richer party only and not to the joint income.(1) The exception is desirable so as to exact contributions from women who choose to remain in full time paid occupations after marriage during the period of potential motherhood.(2) In such cases joint contributions up to £100 p.a. would be payable (where each partner earned £1,000 or more), but endowments would never rise higher than in proportion to a contribution of £50.

6. In a scheme which I published in 1943, I proposed to exempt women completely from the contribution, on the ground that, since women generally receive lower pay in consideration of their lack of family responsibilities, it would be unfair to make their incomes contribute to family endowment. If public opinion crystallized against the idea of " equal pay for equal work " it would be proper to exempt women. But the opposite seems more likely. If women receive equal pay for equal work they must certainly make their contribution to endowment. It may be thought that there is likely to be strong resistance to " equal pay " in industry ; but, as the scheme relates particularly to middling incomes (of which, in the case of women, teaching is a very important constituent) and low incomes are exempt from contribution, the inclusion or exclusion of women should be decided by reference to what is likely to happen in the middling sphere.

7. To the endowment financed from the contributions there should be added a flat rate of 8s. per week(3) per child, for every child after the first, paid out of the Exchequer. Where the parental income did not exceed £250, this Exchequer payment would constitute the whole endowment.

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(1) i.e. Aggregation is *more* equitable than separate levies on the two incomes. It cannot be claimed to be entirely equitable. For a completely equitable scheme see variant of present proposal in " Supplementary Submission " below.

(2) An exception to the rule might be allowed in the case of women marrying after a certain age.

(3) As explained in para. 23 of the Introductory Note, I should prefer a somewhat larger sum; but in this submission I confine it to 8s. in order to show what considerable endowment can be obtained by the Insurance method without further burdens on the Exchequer.

8. The principle which governs the scale of endowment is that the contributor who has an average number of children in excess of one (reckoning the second child as a half) receives back in endowment sums in total equal to 8s. a week for every child in excess of one plus what he has contributed or is expected to contribute should he live to enjoy an average period of income receipt (in accordance with the Life Tables) up to his sixty-sixth birthday. Thus, apart from the flat rate of allowance available to all, each income group receives back precisely what it pays in and there is no question of one income group subventing another. The incidence of the 8s. a week depends on the general system of taxation in force from time to time.

9. The " full " rate of endowment, as shown in the table, should be paid for every child born to a woman after her second and a half rate should be paid in respect of the second child.

10. When the total endowment payable per child has been computed, it should be divided into 34 parts (called " endowment units "), of which one each should be paid annually during the first seven years of the child's life, two each annually during the next six years and three each annually during the next five. This corresponds to the rising need and power of the child, to share in the consumption of goods and services on which the family income is expended (see para. 34 of introductory note). Also the relatively high figure receivable during the adolescent period may serve as a greater psychological inducement to parents to have an additional child than the same sum of money more evenly spread over the years.

11. The endowment payable in respect of each income level should be published, so as to have its proper effect. As some of the assumptions on which the scales are calculated are necessarily subject to verification, there would have to be a periodic revision. (For details of this, see notes appended to the table.) But parents would be entitled during the eighteen years of the beneficiary period to the full scales in force at the time of the birth of the child.

12. To secure the greatest possible advertisement effect, endowment arising from the Exchequer contribution of 8s. a week or £20 16s. 0d. a year should be aggregated with that provided by the insurance fund in the published scales. If endowment is provided in bits and pieces parents will be slow to appreciate the total benefit available.

13. Owing to the plan for making the benefits rise with the child's advancing years and for giving only a half rate for the second child, persons with incomes less than £500 a year would actually receive under the scheme less than £20 16s. 0d. a year in respect of the second child during its first seven years. This would be undesirable ; no one should receive less than £20 16s. 0d. in respect of the second child ; by a small adjustment the full amount of £20 16s. 0d. should be paid for the second child during its first seven years and a corresponding amount deducted from payments in its next six years.

14. The scale of endowment should be governed by the income of the richer parent. If the joint income was taken there would be a strong inducement to the wife to postpone motherhood in the hope of accumulating a larger endowment. This would be undesirable ; it is important to encourage early motherhood. On the other hand we should not go to the opposite extreme and scale the endowment to the income of the father in every case. It is only just that a gifted woman, who wished to cast her lot in life with a bad earner, should be able to secure an endowment related to the income position she had been able to build up for herself. I have discussed the disposal of contributions received from women in note 12 appended to the table.

15. In order to compute the appropriate scale of benefit, it is necessary to assess the father's probable length of life up to his sixty-sixth birthday. This is a comparatively simple matter. The Life Tables published in 1931 show the male expectation of life on the twenty-first birthday, assuming that everyone is deemed to die on his sixty-sixth, as 39.43 years. Since then there has been a notable reduction in mortality, and it is safe to take the expectation of life as defined as 40 years.

16. A more difficult matter is the assessment of what a man is likely to contribute per annum after the period when the endowment begins to be paid. I suggest that it should be assumed that his income as assessed in the last preceding year continues until his sixty-first birthday (viz., till the end of 40 years after his 21st). Some incomes will in fact fall while others rise. It would not be considered fair that a man should pay 1s. in the £ on all increments of income accruing after the receipts of the last instalment of endowment he was likely to enjoy. Nor would it probably be necessary since average income has an upward tendency with advancing years. It would probably be sufficient, in order to offset declines in income after the endowment had been paid, to require a man to pay contributions on any subsequent increments of income up to but not exceeding, say, 20 per cent. of the income accruing at the end of the endowment period. The end of the endowment period may be defined as the date on which a child reaches its eighteenth birthday, provided that there are no younger children then in existence.

17. The amount of endowment payable to the individual parent should be re-assessed annually, having regard to his last recorded income level. As it will be assumed that this level will be maintained subsequently until the sixty-first birthday, an increment would make a substantial difference to the amount of endowment due. Where a man has a very variable income, it could be arranged, at his option, that the endowment should be related to the average income in the last preceeding five years rather than to the income of the last year.

18. This annual re-assessment is very important. A man may still be earning a very modest income at the time of contemplating marriage or after the birth of his second child, but may have a reasonable expectation of advancement during the next fifteen years, whether by regular increments of salary or by normal progress in his profession. The greater part of the endowment comes at a fairly late stage, namely, in the second decade of the lives of the third and subsequent children. The amount of the endowment then accruing is strongly affected, as may be seen by comparing lines 5 and 6 of the Table, by advances of income which accrue in middle age. If a man has a reasonable expectation of such advances he should be able to rely on corresponding increases to endowment and to know from published tables what these will be when he takes stock of his position at the time of deciding on marriage or on having additional children.

19. It should also be explained in the published tables that a man who has three children gets more than all his contributions back (in addition to the state subvention) and that a man who has four children can double his money (also in addition to the state subvention). (See Note 5 appended to table.) If it were generally known what handsome results can be obtained by an insurance scheme, there would surely be a wide demand for it.

20. It may be worth observing that in published tables the gross amount of endowment payable should be stated and not that amount less the contribution due from the father. There is some danger that an official responsible for drawing up the tables might out of an incorrect idea of accuracy state the

net amount. Such a method of drawing the tables would not only reduce the psychological inducement to parenthood, but would be in substance untruthful. The true benefit accruing to parents when they have, say, a third child, is their income if they have that child less what their income would be if they did not have it. As they have to pay the same contribution whether they have it or not, the " true benefit " in respect of this child is the gross endowment payable not the endowment less the current contribution. Furthermore this gross amount should be paid in full at regular intervals ; the contribution should not be set off against it but should be collected separately, perhaps at the same time as Income Tax.

21. The scales in the table which follows are computed on the assumption that the net reproduction rate has risen, under the stimulus of the scheme, to 1. If it did not so rise, the scales, which should be revised every five years in the light of the experienced net reproduction rates, could be increased and a further stimulus to reproduction could thus be provided. Per contra if the net reproduction rate rose above one, the scales and thereby the stimulus would have to be reduced (subject to the protection of vested interests as stated in paragraph 11 above). Thus the scheme contains within itself a self-righting mechanism, by which when the stimulus is inadequate it is increased, and conversely. It must be recognised, however, that even so, the scheme may fail to produce the required result ; in that case the contribution of 1s. in the £ might have to be increased.

22. There follow (i) a table showing for certain selected income positions what endowment could be paid under this scheme (ii) notes on assumptions and technical points connected with the calculations and (iii) some specimen calculations of the figures shown in the Table.

23. I have worked out the scheme in some detail. No doubt any scheme actually proposed would differ from my scheme in various particulars. None the less it seemed worth while to work through the details in order to demonstate that a scheme of this kind would in fact yield endowments of the handsome order of magnitude that I claim.

TABLE

Endowments payable per child for every child after the
second ; half rates also payable for the second child

(For certain selected income situations)

(For parents who pay insurance contributions of 1s. per £ of income)

Annual income of father(1)			Benefit in each of the first seven years of the child's life (0–7)	Benefit in each of the next six years of the child's life (7–13)	Benefit in each of the next five years of the child's life (13–18)
			£	£	£
At whatever age of father(1) child is born	1. 1,000	constant ...	67	134	201
	2. 800	,, ...	56	112	168
	3. 600	,, ...	46	92	138
	4. 400	,, ...	35	70	105
	5. 300	,, ...	30	60	90
Assuming child is born when father(1) is 29½ years old	6. 300 in 22nd year rising by 100 at 3-yearly intervals to 1,000 after 21 years		39 rising to 46	92 rising to 106	159 rising to 174
	7. 300 in 22nd year rising by 80 at 3-yearly intervals to 860 after 21 years		37 rising to 43	86 rising to 98	147 rising to 156
	8. 300 in 22nd year rising by 50 at 3-yearly intervals to 650 after 21 years.		34 rising to 37	74 rising to 82	123 rising to 126

(1)Or mother if *either* her unearned income in the year before the child's birth *or* her earned plus unearned income in the last year before marriage is higher than the income of the father in the year before the child's birth.

NOTES EXPLANATORY OF THE CALCULATIONS USED FOR THE ABOVE TABLE

1. It is assumed that the net reproduction rate will be 1, and that a gross reproduction rate of 1.15 is required to secure this.

2. Contrary to custom the number of births is related to the number of fathers. This should not produce a serious error unless we have still to face a heavy loss of male life in the war. In that case we should require more children per father ; it is arguable that the endowment for such additional children should be provided by a special post-war levy rather than out of the funds of a scheme intended to be permanent.

3. The crucial question in the calculations is the frequency distribution of families. In the following frequency table, which I have used, thirty per cent. of the male contributors are set down as childless. This is a pessimistic assumption, unfavourable to the finances of the scheme; but I have felt bound to assume the worst in recommending the scheme. If there were less childless male contributors, the scale of endowment could be increased, since if there are less childless men, then, for a given number of children per 100 men, there will be more first children and therefore less children requiring endowment. The remainder of the table follows almost automatically from this basic assumption, supposing that the distribution is a regular one.

4. The following table has been used:—

Net reproduction rate: 1.   Gross reproduction rate: 1·15.

Number of men	Number of children per man	20 Men		
		Total number of children	Number of second children	Number of third and later children
6	0	0	0	0
1	1	1	0	0
3	2	6	3	0
5	3	15	5	5
3	4	12	3	6
2	6(^{1})	12	2	8
20		46	13	19

(^{1}) Six is taken to be the average size of all families in excess of 4.

5. Thus every 20 men are required to have 46 children on average of which 13 will be second children and 19 third or later children. Since a half rate of endowment is paid for second children the thirteen second children may be regarded as $6\frac{1}{2}$ children requiring full endowment and there will thus be $25\frac{1}{2}$ such children in all per 20 men. Consequently it will be possible to provide for every third or later child a full endowment of an amount equal to $\frac{20}{25\frac{1}{2}}$ or $\frac{40}{51}$ths of the sum-total of an individual's contributions paid or expected to be paid, together with $\frac{20}{51}$ths of his total contribution for the second child. Thus anyone who has three children gets more than all his contributions back ; by having four children one can double one's money (approximately) and so on. This is an attractive expectation which should be advertised.

6. Since 20 fathers are expected to have on average 32 second and later children (1.6 per father), the Exchequer contribution of £20 16s. p.a. in respect of these, which, I suggest, should continue for 18 years, amounts when aggregated for the average father to £20.8 × 18 × 1.6 = £599. I have rounded this to £600.

7. I have assumed interest at $2\frac{1}{2}$ per cent. p.a. and have used compound interest in all calculations.

8. In cases where income is constant (e.g. lines 1-5 of table) it has been possible to eliminate interest from the calculations by making a particular assumption. If the father pays contributions from his twenty-second to his sixty-first birthdays inclusive (expectation of life on the 21st being 40 years), the centre of gravity of his contributions is when he is $41\frac{1}{2}$ years of age. Owing to the scale of endowment ascending with the child's age, the centre of gravity of the payments for endowment in respect of a particular child is that child's 12th birthday. Consequently if the " average " child requiring endowment is born when his father is $29\frac{1}{2}$ years of age, the centre of gravity of the contributions coincides with the centre of gravity of endowment payments (viz. when the father is $41\frac{1}{2}$ years old) and no interest has to be charged or given. Now $\frac{13}{51}$ths of all endowments paid out of contributions go to second children and the remaining $\frac{38}{51}$ths go to third and later children. Consequently the " average " child in the sense required in the penultimate sentence is the child born when the father's age is equal to the average age of fathers at the birth of second children plus $\frac{38}{51}$ths of the difference between the average age of fathers at the birth of second children and the average age of fathers at the birth of third and later children. To eliminate interest, then, we must assume that the " average " child requiring

endowment in the sense defined in the last sentence is born when the father is 29½ years of age. This is clearly much too young, even if one hopes that a more healthy view about early fatherhood comes to prevail. In so far as the average age of fathers at the birth of the later children exceeds 29½, the centre of gravity of endowments comes later than that of contributions, and some interest must be added to the endowments. In fact we have here a hidden reserve in the scheme.

9. Where income is constant no account should be taken of the actual age of the father at the birth of his child, but there should be added to the endowment whatever interest is reckoned as due in consequence of the average age of fathers being what it is. This proviso is to avoid having an incentive to the postponement of fatherhood. There might be such an incentive if a father could secure additional endowment through the accrual of interest merely by having his children later.

10. Where on the other hand income is variable, it is unfortunately necessary to bring interest into the reckoning. As a man's income in early years is often much less than the income which he attains during the endowment period and which is imputed to him in later years for the purpose of revising the assessment of endowment due, the centre of gravity of contributions may fall later than that of the endowments and the interest chargeable against the individual may be not inconsiderable.

11. A perfectly correct answer would require a subtle mathematical technique ; the crude method which I have employed provides an answer that may be relied on for practical purposes. It is as follows. Let us suppose that all endowments were paid as a lump sum at the centre of gravity of the endowment period, which, on the assumption regarding the average age of fathers of note 8 above, is when the father is 41½ years old. If he earns £300 in his twenty-second year and £400 in each of the following 39 years of his presumed life as a contributor, the interest which accrues on his payments in respect of years 2 to 20 inclusive is balanced by the interest chargeable for endowment advanced in anticipation of his payments in respect of years 21 to 39 inclusive. But the interest which accrues on his payment of 5 per cent. on £300, viz. £15, in his first years does not fully balance the interest chargeable against the anticipation of his payment of £20 for his fortieth contribution year. Consequently the compound interest should be charged against him on £5 for 19½ years, viz. the period between his being 41½ years old and his sixty-first birthday. More generally, if an increment occurs n years after his twenty-first birthday, compound interest should be charged on that increment, equal to compound interest on one year's incremental pay for 19.5 years plus that on one year's incremental pay for 18.5 years plus . . . plus that on one year's incremental pay for $19.5 - n + 1$ years. In compiling the Table I have dealt with each increment separately in this manner. The main flaw in this method is that it does not allow for the advance of the centre of gravity of endowment to a later period as income and endowment payments increase ; the error is, however, unfavourable to the finance of the scheme and therefore on the right side, and small.

12. There remains the question of the disposal of contributions by women. These are an additional revenue to the Insurance Fund against which only one small charge has been debited in the scheme as so far presented. This small charge arises when the last assessed income of the wife(1) exceeds that

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(1) This should be the earned and unearned income of the wife in the last full financial year before marriage or her unearned income in the last year before the birth of the child, whichever is higher.

of the husband, the endowment payable being calculated by the income of the richer partner. The excess of the actual endowment over that which would be payable if the father's income were the basis of assessment will have to be charged against the fund provided by women contributors. There will remain a substantial amount in that fund. I suggest that it be used to increase in proportion the endowments payable against the father's contributions. The revenue of this fund is (i) 1s. in the £ on all incomes above £250 p.a., earned or unearned, of un-married women (with a maximum contribution of £50) plus (ii) a similar contribution on all earned incomes of women over £250 p.a. between the end of the first and that of the twenty-first year after marriage plus (iii) a similar contribution in certain cases on the whole or a part of the income of married women earned or unearned, above £250 p.a. or under £250 p.a., save as already provided for under (ii), the whole being subject to contribution where the joint income of the parents does not exceed £1,000 p.a., and a part being subject where the joint income exceeds £1,000 but that of the father falls short of £1,000 p.a., the part subject to contribution then being the difference between £1,000 p.a. and the father's income.

13. I have no means of knowing what the income of the fund supplied by women contributors would be. For the purpose of the calculation I have assumed that the disposable income (viz., the income minus the charge referred to in the third sentence of para. 12) is 15 per cent. of all male contributions. This is admittedly a pure guess. If it were larger the scale of endowments could be increased accordingly. If it were much smaller, say $7\frac{1}{2}$ per cent. (the amount can certainly not be negligible), this would only reduce the endowments set out in the table by a small amount, e.g., those in line 1 by 5.2 per cent. or those in line 5 by 3.5 per cent. (But see next paragraph.)

14. Hidden reserves.

(i) I have taken no credit for children dying within the period of endowment. As the deaths tend to occur early and the major part of the endowment late in this period, there should be a considerable reserve here. It should easily outweigh any over-estimate (which may, on the other hand, be an under-estimate) of women's contributions. The deaths of contributors on the other hand are debited in my calculations, since contributions are only reckoned as due to come during "the expectation of life" of the contributor.

(ii) We hope that 30 per cent. of men will not be childless. A reduction in this figure would decrease the number of children (at any given net reproduction rate) requiring endowment, as explained in note 3 above.

(iii) The average age of fathers in the special sense defined in note 8 above is likely to be more than $29\frac{1}{4}$. To the extent that it is, some interest would be available in positive amounts in the case of fathers of constant income and by deduction from interest debited in the calculations in the case of fathers of rising income.

15. Revision of published scales.

Revision of scales will be necessary in respect of two quite distinct classes of circumstances, namely (i) changes in vital statistics and (ii) changes in financial conditions. (Note: I am here concerned with revisions in the scales themselves, not with reassessments of amounts payable as endowments to individuals owing to changes in the beneficiary's circumstances.)

(i) I suggest that there should be a revision of the scales once every five years to make allowance for changes in the net reproduction rate, the frequency distribution of families and the expectation of life. The changes in the expectation of life after 21 are likely to be small within such a period. But we may expect considerable changes in births and young mortality. If the net reproduction rate rises above one in the first period or rises at all in a later period, the fund will make a loss (a) in respect of endowments paid out during the period and (b) in respect of the eighteen year commitment in regard to children born in the period ; conversely the fund will make a profit if the rate does not rise to one in the first period or falls in any subsequent period. Any profit should be used to increase the scales in the following period. If a loss is made this means that net reproduction is increasing and there should be such national rejoicing that Parliament should vote the sum, which will not be a large one, required to restore the fund to equilibrium. Alternatively, the more niggardly method could be employed of reducing scales in the following period by enough to make good the loss.

(ii) On the financial side the two chief unknowns are (a) the amount of contributions by women and (b) the aggregate deficiency in contributions owing to contributors' incomes falling between the end of the endowment period and the sixty-sixth birthday.

(a) Once the correct ratio of female to male contributions is established, there is not likely to be much gain or loss through a variation in this ratio within a five year period. The necessary adjustment to scales could be made once in five years or less frequently.

(b) I have suggested in paragraph 16 of the submission, that the deficiency due to incomes falling after the end of the endowment period might be covered by exacting contributions from increments to income occurring after the end of the endowment period not exceeding 20 per cent. of the contributor's income at the end of that period. Somerset House may be able to provide an approximate figure ; failing that, we should have to await experience. If the figure of 20 per cent. (or whatever the figure chosen) proved too low, the deficiency should be made good not by revising the scales of endowment, but by altering the figure itself (viz., the amount of increment after the end of the endowment period from which contribution should be exacted). In any case this figure would probably have to be revised from time to time. This particular financial revision ought not to occur more frequently than once in ten years, so as to include the experience of good and bad years in the trade cycle. Fears may be entertained of a deficiency arising through a secular downward trend in average incomes. But with a stationary population and a rising " real " income per head, a secular fall in average money income per head would imply a persistent monetary deflation of a most extreme kind which we should be wrong to entertain as a hypothesis.

16. I have debited nothing for office expenses. I assume that these will be borne by the public, which will be gaining large sums by the elimination of reliefs for children in Income Tax assessments.

SPECIMENS OF WORKINGS

A. Line 1 of Table. Constant income of £1,000 p.a. There is only one main calculation, which is in five stages as follows:—

1. Past and expected contribution by father at £50 p.a. for 40 years (expectation of life) = £2,000.

2. Add 15 per cent. of this from fund supplied by women contributors:—

$$£2,000 + £300 = £2,300$$

3. Add state contribution. It appears from the frequency table that there will be 1·6 children other than first children per male contributor. I assume that the state contribution of £20 16s. p.a. (= 8s. a week) continues for 18 years.

$$1·6 \times £20·8 \times 18 = £599·04$$

I have rounded this to £600.

$$£2,300 + £600 = £2,900.$$

4. It appears from the frequency table (explanatory notes 4 and 5) that $\frac{49}{51}$ths of this amount is available per fully endowed child.

$$£2,900 \times \tfrac{49}{51} = £2,274\tfrac{39}{51}.$$

5. This sum is divided into 34 endowments units.

$$£2,274 \tfrac{39}{51} \div 34 = £67 \text{ (rounded to the nearest £1.)}$$

£67 is payable in each of the first seven years.
£67 × 2 = £134 is payable in each of the next six years.
£67 × 3 = £201 is payable in each of the next five years.

B. Line 6 of the Table. Income of £300 p.a. in the contributors' 22nd year, rising by £100 p.a. every three years to £1,000 p.a. at the end of 21 years.

The calculation has 6 main parts, of which the first has 6 stages and each of the others 7.

The father is 29½ years old when the child is born.

I. Assessment at father's 29th birthday([1]):—

1. Past and expected income:—

$$£300 \times 3 + £400 \times 3 + £500 \times 34.$$

Past and expected contributions:—

$$£15 \times 3 + £20 \times 3 + £25 \times 34 = £955.$$

2. Deduct compound interest at 2½ per cent. on £10 for 19½ years on £10 for 18½ years, on £10 for 17½ years, on £5 for 16½ years, on £5 for 15½ years and on £5 for 14½ years, in accordance with the argument set out in explanatory note 11, i.e. deduct £24·30.

$$£955 - 24·30 = £930·70.$$

3. Add 15 per cent. of this from pool of women's contributions, i.e. add £139·60.

$$£930·70 + £139·60 = £1,070·30.$$

4. Add Exchequer contribution of £600.

$$£1,070·30 + £600 = £1,670·30.$$

5. Take $\frac{49}{51}$ths of the last-mentioned sum to find endowment payable for each fully endowed child.

$$£1,670·30 \times \tfrac{49}{51} = £1,310.$$

6. Divide this by 34 to find the endowment unit available at this date which will govern assessment when child is born.

$$£1,310 \div 34 = £39 \text{ (rounded to the nearest £).}$$

([1])   Actual assessment at end of financial year; see note at end.

II. Assessment at 31st birthday.

1. Increment of £100 accrues in 31st year of father's life. Contribution on this is £5 for 31 years, viz. from 31st to 61st birthdays inclusive.

Add £5 × 31 to £955 carried from I. 1. (above).

$$£955 + £155 = £1,110.$$

2. Deduct interest as in I, 2. above plus compound interest at $2\frac{1}{2}$ per cent. on 9 sums of £5 each for $19\frac{1}{2}$, $18\frac{1}{2}$, $17\frac{1}{2}$, $16\frac{1}{2}$, $15\frac{1}{2}$, $14\frac{1}{2}$, $13\frac{1}{2}$, $12\frac{1}{2}$, and $11\frac{1}{2}$ years respectively, i.e. deduct £24·30 + £21·05 = £45·35.

$$£1,110 - £45·35 = £1,064·65.$$

3. Add contribution of 15 per cent. from women's pool.

$$£1,064·65 + £159·69 = £1,224·34.$$

4. Add £600

$$£1,224·34 + £600 = £1,824·34.$$

5. Multiply by $\frac{40}{51}$

$$£1,824·34 \times \tfrac{40}{51} = £1,431.$$

6. (New stage).

The endowment payable for years 0 and 1 of the child's life will have been already assessed and in part paid. This is £39 p.a. Deduct £39 × 2

$$£1,431 - £78 = £1,353.$$

7. 32 more endowment units are payable on this child £1,353 ÷ 32 = **£42** This is the newly assessed endowment unit.

III. At 34th birthday.

1. £5 × 28 = £140.

$$£1,110 \text{ (from II, 1.)} + £140 = £1,250.$$

2. Deduct interest as in II, 2. plus $2\frac{1}{2}$ per cent. on 12 sums of £5 each for $19\frac{1}{2}$, $18\frac{1}{2}$, ... and $8\frac{1}{2}$ years respectively, namely £45·35 + £25 = £70·35.

$$£1,250 - £70·35 = £1,179·65.$$

3. Add £176·94.

$$£1,179·65 + £176·94 = £1,356·59.$$

4. £1,956·59.

5. £1,535.

6. Deduct endowments already paid as in II, 6. plus endowment of £42 for 3 years,

namely £78 + £42 × 3 = £204

$$£1,535 - £204 = £1,331.$$

7. £1,331 ÷ 29 = **£46.**

IV. At 37th birthday.

1. £1,250 (from III, 1.) + £5 × 25 = £1,375.

2. Deduct interest as in III, 2. plus interest on 15 sums of £5 each for $19\frac{1}{2}$, $18\frac{1}{2}$, ... and $5\frac{1}{2}$ years respectively, namely £70·35 + £27·60 = £97·95.

$$£1,375 - £97·95 = £1,277·05.$$

3. £1,468·60.

4. £2,068·60.

5. £1,621.

6. Deduct endowments already paid as in III, 6. plus endowment at £46 for 2 years plus endowment at £92 (double rate) for 1 year, namely
$$£204 + £46 \times 2 + £46 \times 2 \times 1 = £388$$
$$£1,621 - £388 = £1,234.$$

7. £1,234 ÷ 25 = **£49.**

V. At 40th birthday.

1. £1,375 + £5 × 22 = £1,485.

2. Deduct interest as in IV, 2. plus interest on 18 sums of £5 each for 19½, 18½, ... and 2½ years respectively, namely £97·95 + £28·96 = £126·91.
$$£1,485 - £126·91 = £1,358·09.$$

3. £1,661·79.

4. £2,161·79.

5. £1,696.

6. Deduct endowment already paid as in IV, 6. plus endowment at £98 (double rate) for 3 years, namely,
$$£388 + £294 = £682.$$
$$£1,696 - £682 = £1,014.$$

7. £1,014 ÷ 19 = **£53.**

VI. At 43rd birthday.

1. £1,485 + £5 × 19 = £1,580.

2. Deduct interest as in V, 2. plus interest on 18 sums of £5 each for 19½, 18½, ... and 2½ years respectively, namely £126·91 + £28·96 = £155·87.
$$£1,580 - £155·87 = £1,424·13.$$

3. £1,637·74.

4. £2,237·74.

5. £1,755.

6. Deduct endowment already paid as in V, 6. plus endowment at £106 (double rate) for two years plus endowment at £159 (treble rate) for one year,
$$\text{namely } £682 + £371 = £1,053.$$
$$£1,755 - £1,053 = £702.$$

7. £702 ÷ 12 = **£58.**

Summary.

When the child is born the endowment unit is £39 p.a. as assessed on the father's 29th birthday.

A new assessment has to be made on the father's 31st birthday, since the father has received a rise of £100 p.a. payable in his thirty-first year. This establishes the endowment unit of £42 p.a. payable after the child's 2nd birthday.

Similarly £46 p.a. is payable after its fifth birthday.

When the child reaches its seventh birthday two endowment units, viz. £46 × 2 = £92 p.a., are payable.

On the father's 37th birthday, viz. during the child's seventh year, the endowment unit rises to £49 and the endowment payable to £98.

During the child's 10th year the endowment unit rises to £53 and the endowment payable to £106.

On the child's 13th birthday the endowment unit is still £53, but the endowment payable rises to £53 × 3 = £159.

During the child's 13th year, the father's income rises and on its 14th birthday the endowment unit is £58 and the endowment payable is £174.

Note.—In practice presumably the assessments will be made not on the father's birthdays, but at the close of the financial year. If the " pay as you earn " principle is applied, contributions should begin immediately after the father's 21st birthday. If the " pay as you earn " principle is not adopted, owing to the lag between the receipt of income and the payment of contribution, contribution should first be levied on the father's income during the financial year in which his 21st birthday occurs. The first payment of an annual contribution would then occur on average on the father's 22nd birthday (supposing a six months' lag after the close of the financial year). My calculations have been made on the latter assumption, which is rather less favourable to the finances of the scheme.

SUPPLEMENTARY SUBMISSION

1. It was suggested at the session on 10th November that it would be appropriate for me to clear up in writing certain points connected with my submission and oral evidence. I accordingly present herewith a supplementary submission, which takes account of certain criticisms that were made and is the fruit of further reflexion. The supplement deals with the following topics: —

    A. Principle that the compulsory insurance scheme for supplementary endowments should not involve any transfer of money between income classes, *each income class being entirely self-financing.*

    B. Revised proposals for principles to govern contributions by *women* and disposal thereof.

    C. Question of *scale* of contributions and endowments.

    D. Alternative proposal regarding *method of paying endowments.*

    E. *Wangling.*

There are also attached four Appendices relating to the texts of A, B, D and E.

2. In oral evidence I offered to put on paper my ideas as to the inception of the insurance scheme. As, however, I appear to have set out my proposals rather fully in answer to the question, I judge that any further statement would merely be a reduplication. I would, however, make one other point in its favour. It was put to me several times that any scheme proposed must be acceptable to the general public. Now the man in the street very naturally judges a new proposal partly by reference to his own pocket. I suggest that young men and women, on whom the scheme would be compulsory, would in the great majority of cases welcome the opportunity to cover their future liabilities as parents on a generous scale at a modest present cost. No such advantageous scheme is or could be made available to them by the method of private insurance. It is those already over 30, for whom cares and responsibilities and overhead expenses are beginning to multiply who would be more inclined to regard the contribution as a further " burden ". For these the scheme would be voluntary, so that they would have no private interest to prejudice them against it.

A.—Each Income Group Self-Financing

3. The scheme I have the honour to recommend is that there should be provided supplementary endowments by a method of compulsory insurance by which each income group would be self-financing. Stated otherwise the principle is that the parent of an average family should get back precisely what he or she puts in. In so far as members of an income group get back less, because they have smaller families (or none) the residue automatically goes to other members of the same income group who have larger families. A group is defined not by reference to income in a particular year, but by the whole pattern of income through life.

4. This being the master idea, I think I am entitled to claim that it should not be held in objection to my recommendation that it might involve a transfer of income from poorer to richer people. I may perhaps be permitted to put this, so to speak, as a point of honour, since I should view with the greatest aversion any scheme involving such a transfer.

5. Further to my recommendation I have made detailed proposals as to how the scheme might be implemented. My principal object in doing this was to show quite concretely what very handsome endowments could be obtained by a comparatively moderate levy. This cardinal and highly important fact does not depend on various details of my scheme, some of which were criticised, but exclusively on the Frequency Table supplied in paragraph 4 of my " Notes Explanatory of the Table ". The only way in which this frequency table could be altered without doing great violence to probability would be to reduce the assumed figure (30 per cent.) for childless males. If this were reduced, the ratio of endowments to contributions would be still more generous. This may appear paradoxical ; the reason for it is given in paragraph 3 of Notes Explanatory of the Table. It might interest members of the Commission to know that I was at the greatest pains—for obvious reasons—to alter the frequency table, so as to be able to make the standard endowment ths instead of ths of the contribution. That I found it quite impossible to do this—save by reducing the number of childless men, and that I would not do, because it would be favourable to my case—indicates the high degree of reliance that may be placed on the Table. It is this extremely favourable relation of endowments to contributions that makes such a strong case for the Insurance method of meeting this problem.

6. If my detailed plan fails to implement the principle stated in paragraph 3 above, that must be taken to reflect on my actuarial capacity rather than on the merits of the main proposal. Much time was given, during the oral evidence, to the consideration of whether the detailed scheme did or did not implement the master principle.

7. In consequence of certain criticisms advanced by Sir Hubert Henderson I began to feel some uneasiness, which I frankly admitted. This focussed itself in my mind on the case of the man reaching £250 p.a. and coming into the scheme only after some children had grown up, and I asked leave to make a further submission. Sir Hubert Henderson on the other hand suspected correctly that this was a flaw which also affected my treatment of the man with a rising income who was in the Scheme from the beginning.

8. During the interval of adjournment I realised what mistake I had made, and in the long statement that I made at the end of this part of the evidence, I suggested a method of putting the matter right.[1] This is set out in Appendix I. After further reflexion and a study of the various special points raised in this connexion by Sir Hubert Henderson, I feel confident that the detailed scheme is now watertight and would accurately implement the principle that each income group should be self-financing.

9. The scheme as amended reduces the incentive to wangling, of which Sir Hubert Henderson expressed a fear, to a minimum. This is discussed in Appendix IV.

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[1] It was true that when a favourable change of income took place after one or more endowable children were grown up a man would not have got total endowments fully proportional to his contribution. What was not true was that his contributions would have gone to finance another class—I knew I was on sure ground in denying Sir Hubert's contention that they would—they would simply have created a surplus in the fund. Sir Hubert might, however, contend that ultimately the surplus would be distributed and thus another class would be indirectly assisted.

B.—WOMEN

10. I beg leave to submit a modified and simplified scheme for the treatment of contributions by women and endowments arising therefrom in substitution for my previous proposals. I feel bound to recognise the force in Sir Hubert Henderson's contention that in the case of investment incomes my previous proposals would give rise to wangling. On reflexion I feel the importance, both in equity and for the sake of winning acceptance for the project, of treating female incomes as nearly as possible on the same basis as male incomes. I feel that for the sake of this some features in my previous proposal designed to reduce the inducement to women to postpone marriage or motherhood may have to be sacrificed.

11. Accordingly I make proposals as follows:—

(i) Contributions at the standard rate to be levied on all income accruing to women, subject to the maximum contribution of £50 on an income of £1,000 or more, subject also to a joint maximum contribution by a married couple of £50, but the earned income of women after the end of the "expectation period" ([1]) to be subject to no contribution.

(ii) Endowments to be such that where the endowable family is of average size the whole of the father's contributions recorded and expected together with the whole of the mother's contributions recorded and expected are paid back.

(iii) The expected annual contributions of the father during the remainder of his "expectation of life" are taken to be equal to his last recorded contribution (or its average in the last 3 or 5 years). The expected annual contributions of the mother in respect of investment income are taken to be equal to her last recorded contribution (or its average etc.). The expected annual contributions of the mother in respect of earned income are taken to be nil.

(iv) It by no means follows from (iii) that a mother is deprived of benefit in respect of her earnings during married life. Quite the contrary. It is true that on an early assessment day no future earnings are imputed to her in advance. But as time goes on, if she does in fact earn, then these earnings are recorded and imputed, and in accordance with the revised method of computation (Appendix I) she will ultimately receive back the whole contribution on her earnings as a married woman, if her endowable family is of average size. She will, it is true, have no earnings imputed to her after the end of the "expectation period", and that is the reason for the provision in (i) above that the earned income of women after the end of the "expectation period" be not subject to contribution.

(v) By this scheme men and women are treated exactly on a par, save that (i) no earnings are imputed in advance to women after the end of the "expectation period" and no contributions levied on such earnings, and (ii) no earnings are imputed to a woman after she has married until they actually come in. But she will not be seriously damnified thereby since all earnings eventually subject to contributions will be returned in endowment.

([1]) The "expectation period" is defined as ending in the case of parents when a child reaches the age of 18 and there are no surviving younger children, in the case of a childless man on his fifty-sixth birthday and of a childless woman on her forth-sixth.

N.B.—The "expectation period" must not be confused with the "expectation of life" which is also referred to in these notes. The "expectation of life" is the average number of years men or women live after a given year, as shown in the Life Table, but assuming that everyone there shown as dying after 65 dies on his or her sixty-sixth birthday (since that is the date when contributions cease).

(vi) I feel it desirable, however, to incorporate a feature analogous to one of my earlier proposals which makes a special concession to women. One must have some sympathy for a woman who is a good earner but wishes to cast her lot in life with a bad earner. She may be a competent administrator or teacher while her would-be husband is a poet or painter, whose genius is not widely appreciated, or a man of sound instincts and good nature but lacking in practical talent, or, more simply, a poor man whom she happens to love. Let us suppose for example, that she earns a steady £600 p.a. while he cannot manage more than £300. She may feel—"If only I were a man, I should have £600 p.a. imputed to me for life and get a correspondingly enhanced endowment." I propose therefore that where a woman has an established earning record of at least five years on the first assessment day, no less a sum than her average earning during the five years shall be credited as earned income to the couple each year in future and be imputed for future years, even if the woman stops earning when she marries. To take the illustration given above, if the wife gave up her job, the couple would have credited to them for each passing year the contribution on £600 and have a similar contribution imputed to them for all future years; but they would only pay a contribution on £300 p.a. If she retained her job they would have to pay and be credited with a contribution on £900 in current years but would still only have £600 p.a. imputed to them for future years. The merit of this arrangement would be that while enabling the woman to get an endowment related to her earning capacity it would diminish her incentive to retain her job. If the husband ever managed to raise himself to £600 p.a. then the yield from this concession to the woman would lapse, since he would have £600 credited to him currently and imputed to him in future of his own right. There remains the question of how this concession is to be financed; happily there is a hidden reserve in the scheme arising out of certain contributions by spinsters (as explained in Appendix II) which should be sufficient to finance this concession.

C.—Scale of contributions and endowments

12. While for reasons set out in my introductory note I regard a contribution of 1s. in the £ as the least that accords with the gravity of the present situation when seen in a broad historic perspective, I draw attention to the fact that all the principles and methods here proposed for dealing with this contribution could equally well be applied if the contribution were larger or smaller, say, 2s. in the £ on the one hand or 6d. or even 3d. on the other. Moreover, once the insurance scheme is established the scale can readily be increased or diminished in the light of subsequent experience. A more complicated scheme for helping parents by tax adjustments might provide some modest assistance in the first instance, but would be incapable of expansion when the development of public opinion or the course of events demanded it.

D.—Paying out the endowments

13. In my submission I made proposals for the payment of endowments on a scale rising with the age of the child. I had in mind (i) what would be convenient for parents and (ii) the good advertisement effect of the treble rate available in the last five years. On reflection I have doubt whether it would be politic or desirable to fix upon such details at this stage. However securely we guarantee the self-financing basis of each income group, it may be difficult to persuade the man in the street that it is not he who is being asked to pay these handsome sums to comparatively wealthy people. Furthermore, there may be many points affecting the convenience of parents which

cannot be clearly foreseen and catered for in advance. It might be well, therefore, to leave it to a Statutory Commission in charge of the Fund to decide the details of the manner in which the money was paid out. Such a Commission might be assisted by a Parents' Advisory Committee. It might also be possible to leave certain matters to individual choice. Thus a parent might be presented with half a dozen or a dozen alternative ways of drawing out his money among which he could choose one to suit his own particular financial circumstances. In certain cases a man might wish to draw out part of the endowment in a capital sum at the beginning, e.g., towards the cost of purchasing a larger house. (On the finance of this, see Appendix III.)

14. I am, therefore, of opinion that the legislative measure might be confined to the following matters:—

(i) to establish a compulsory insurance payment of 1s. (or whatever sum decided upon) in the £ (together with the necessary provisions for the treatment of female incomes, maximum annual contribution, terminal dates, assessment of expected contributions, etc.);

(ii) to lay down the principle that parents of an average endowable family should receive back all that they have paid or are expected to pay in contributions;

(iii) to declare that the third and subsequent children should receive a full rate of endowment and the second child a half rate (or whatever alternative arrangement may seem desirable), and

(iv) to set up a Statutory Commission to administer the Fund and regulate the payment out of endowments.

15. The form in which the second clause is drawn should obviate any suggestion that there could possibly be a transfer from poor to rich involved, as well as ruling out much irrelevant controversy on trivial points.

16. For advertisement effect I suggest that it might be sufficient to announce that for the time being parents would receive $\frac{29}{51}$ths of their own (paid and prospective) contributions as an endowment for the second child and $\frac{40}{51}$ths for each of the others. The parents of four children would get barely less than twice all their contributions back.

E.—WANGLING

17. Sir Hubert Henderson criticised the detailed scheme as " chancy " in its incidence and open to wangling. I have accepted his point that it might lead to wangling by the transfer of investments from wife to husband and for this and other reasons have altered my proposals for the levy of contributions on women and for their disposal.

18. His other explicit point that it might lead to the transfer of investments to a father on the verbal condition that he would transfer them back at the end of his expectation period is examined in detail in Appendix IV.

19. It is not possible to deal with the more general suggestion that it might be liable to wangling in a number of ways. I can only plead that this seems to me to do less than justice to its simplicity and precision.

APPENDIX I

REVISED METHOD FOR COMPUTING ENDOWMENTS

1. From paragraph 17 of my original " submission " and from " Specimens of workings ", the first and sixth stages in each of the main parts II-VI in example B, it will be seen that any child still dependent on the father when he receives an increment of income gets the full benefit, through an increase in endowments payable for it during the remainder of its dependence, however short, not only of the current increment, but also of the imputation to the father in advance of a correspondingly higher income during the remainder of his " expectation of life ".

2. All the various criticisms, whether comparing a man having a steady with a man having a rising income, or one who has his children early with one who has his children late or by reference to a man who only rises above £250 after some children are grown up, obtain their validity from the fact that the children already grown up when the favourable change occurs do not benefit from it.

3. I accordingly put before the Commission in oral evidence a proposal that at the end of the expectation period there should be an assessment directed to removing this inequality of treatment. At that point of time all the relevant facts are known (save for further changes of income before the sixty-sixth birthday, which are discussed in paragraphs 6 and 7 below). The number of children is known and the whole income pattern. The total of contributions past and future should be summed. A calculation should then be made of the total due to a parent of that number of children and the income pattern. This total would be compared with the endowments actually paid. The difference would be credited (or debited) to the father.

4. A credit would arise where an increase of income occurred or where a father first began to contribute after some children were grown up. This credit should be spread over the father's remaining expectation of life, and deducted from the sums demanded from him as contributions. Thus in the end every father who has two children will get $\frac{20}{21}$ths of his whole contribution back together with $\frac{10}{21}$ths of his whole contribution for each additional child.

5. A debit would occur in the less common case where income fell after an endowable child has grown up. I suggest that these debits should be treated along with deficiencies in contributions owing to falls in income after the end of the expectation period. Where there was a recovery of income after the end of this period any debit outstanding at the " assessment day " should be recovered by applying the levy of 1s. in the £ on the full income, accruing thereafter.

6. The Lord Chancellor drew attention to the importance of dealing with the case of falling incomes. It would seem a hardship to endeavour to regain the debits and deficiencies referred to in the last paragraph by applying a higher rate of levy per £ on a fallen income. In my original submission I suggested that this gap in the finance of the Fund might be made good by applying the levy to increments of income occurring after the end of the expectation period up to 20 per cent. (or whatever percentage was required) of the last recorded income (or its average for 3 or 5 years). This would be the one exception to the principle that everyone (with an

average endowable family) gets back precisely what he pays in. This would not involve a transfer from the poor to the rich nor necessarily from the rich to the poor, but from men whose incomes rose late in life to men whose incomes fell late in life. As the man who gets a rise in income after his family is floated may be regarded as eminently well placed and the man whose income falls late in life as eminently unfortunate, there seemed to be some poetic justice in the arrangement.

7. It might, however, be argued that there is no strictly logical reason why those whose incomes rise late should contribute more than anyone else to the gap caused by those whose incomes have a late fall, and that those, for instance, with a steady £1,000 p.a. (or more) throughout might well contribute to it. If this view were taken, I suggest that the proper solution would be to deduct an equi-proportional sum from all contributions —it might be of the order of 2 per cent.—to fill the gap. These contributions would be drawn from all contributing classes and would help a class which is on average poorer than contributors as a whole, since it would not include any person whose income after the fall still exceeded £1,000 p.a.

APPENDIX II

SPECIAL CONCESSION TO WOMEN PROPOSED IN PARAGRAPH 11 (vi)

1. The calculation of endowments payable to male contributors is based on the assumption that out of every 20 males of a given income pattern seven will have no children or only one child. This is a safe assumption unless the net reproduction rate rises above one, in which case all the scales would have to be revised (subject to vested interests). The same principle is applicable to the investment incomes of women. But it is not applicable to female earnings owing to the prevalent social arrangement by which many women when they marry or become mothers relax or abandon their efforts to earn money. Of 20 women whose earning " potential " is the same those who remain spinsters are likely to earn more per head than those who marry.

2. Save for the special concession to women proposed in paragraph 11 (vi) of the text, my revised scheme makes contributions on female earnings yield per £ of contribution the same endowments per child as those on male earnings. Consequently, the Fund would balance if spinsters earned no more on average than married women. But as they do earn more, there would be a considerable surplus in the Fund and this should easily cover the special concession to women proposed in paragraph 11 (vi).

APPENDIX III

ENDOWMENT BY A CAPITAL SUM AT BIRTH

1. In paragraph 13 of the text it is suggested that parents might be given a free choice among a number of alternative ways of taking out the endowments due and that one of these might provide a capital sum on the birth of the child (which in certain cases might be especially welcome). The total of money contained in each of the alternatives would not be identical, since an interest adjustment would have to be made as between schemes providing more of the money early and those providing it late in the period of child dependence.

2. A further adjustment over and above the interest adjustment would be required if a capital sum, which should probably not be allowed to exceed one-half of the total endowment due, were payable at or near birth. It would usually be a hardship and sometimes a little brutal to ask a parent to refund money in the event of the early death of a child. To cover this contingency there should be deducted from the total endowment, in the alternative providing an initial sum, an amount equal to what would actuarially be required to insure the child's life for the diminishing amount by which the money advanced exceeded what would have been paid had the endowment been spread in equal annual instalments. If this were done, there would be no need to ask for any money back should the child die.

APPENDIX IV

A SPECIAL CASE OF WANGLING

1. As accounts are squared on the assessment day at the end of the expectation period, the only element of uncertainty is in the regard to the future course of income between that and the sixty-sixth birthday. As income is imputed to a man on the basis of his last recorded income (or its average in the last 3 or 5 years)—at this final date we should certainly choose the 5 year average—Sir Hubert Henderson suggested that a man might acquire a fictitious income, e.g., by the transfer of investments, while endowments were still coming in and relinquish it when the expectation period was over. Thus a man at £800 p.a. might persuade a rich relation to transfer to his name £6,000 in shares thus raising his income to £1,000 p.a. on the understanding that he would surrender the dividends and hand the shares back at the end of his expectation period. Thus he would have £1,000 p.a. imputed to him for the remainder of his " expectation of life " below 66, whereas in fact once the end of his " expectation period " was passed he would only pay contributions on £800 p.a.

2. The possibility of such wangles must be admitted. But in considering whether they would attain dimensions of statistical significance, it is necessary to look at the matter more closely.

3. Sir Hubert Henderson referred to the willingness of members of a family to transfer investments among themselves if any tax gain was likely to result. But it must be remembered that such transfers are usually among fairly wealthy people all of whom are financially safe. If the recipient is not quite safe there is immediately fairly strong resistance to such adjustments.

4. Now in the first place a gain can only accrue from the manoeuvre if the recipient's income is and is expected to remain for the rest of his life substantially below £1,000 p.a. There will not be much gain if he has less than 4 or 5 children. If the principle of the five year average, referred to in paragraph 1 above, is adopted, as it should be, the capital will have to be transferred unconditionally for five years if it is to have its full affect on the endowment of one child and for longer if it is desired to affect more. Let us suppose there are 3 dependent children, numbered 3, 4 and 5,—I begin with 3 because No. 2 only draws a half rate—and that to get the full benefit the capital has to be transferred for 10 years, beginning, say, when the father is 45.([1]).

5. What is the proposition? A man of 45 with £800 a year and no expectation of his income rising above that, and 5 children, 3 of them under 13 years of age, has to ask a rich relation to make over £6,000 unconditionally

for 10 years on the verbal understanding that he will surrender the dividends and return the capital after 10 years. Clearly if there was any covenant the ruse would be transparent and the income would not qualify for imputation after the end of the expectation period. Is this a comfortable proposal to make?

6. I suggest that the proposal is not a comfortable one. This man of mature years, modest income and substantial family is not solid. If his health breaks down, or—supposing his £800 p.a. to be an investment income —if he squanders it by a foolish speculation, and the rich relation cannot be sure that these things will not happen, he will become a case of distress. The rich relation might then be sorry but feel that he has other calls upon his charity. But if the poor relation has legal possession of £6,000, with no more than a verbal promise to repay, it becomes much more difficult for the rich relation to do nothing to help him. I suggest therefore that the rich relation is bound to look askance at the original proposal, and I suggest furthermore that the £800 a year man, foreseeing this, is unlikely to make it. A man of that age and responsibility does not usually like to ask financial favours even of relations.

7. Furthermore the gain from all this is not very great. While the money is nominally with the £800 a year man he has to pay contributions on the full £1,000. Thus he only gains on the imputation of contributions after the end of the expectation period, in this case for 10 years. The contribution on £200 for 10 years is £100. The increased endowments for 3 children resulting therefrom are approximately $3 \times \frac{4}{5} \times £100 = £240$. I suggest that when all this was explained to the rich relation, as it would have to be, rather than part with his legal claim over £6,000 for 10 years, and so far as the law is concerned perhaps for ever, he would say, " My dear fellow, I will gladly give you £240 towards the education of your admirable children ".

8. For those reasons I do not think that this wangle would occur very often.

9. If, however, experience showed that it was occurring on a considerable scale, it could be prevented altogether by withdrawing the general concession that contributions after the end of the expectation period would be reduced below the level previously imputed in proportion to any fall of income below £1,000 p.a., and by only making the concession on condition that the cause of the fall was shown to be unavoidable. This condition could be interpreted generously but not so as to include free gifts of capital to other people.

(¹) It might be supposed that the shares need not be transferred for more than 5 years to affect more than one child, since even if the transfer does not affect the endowments of Nos. 3 and 4 during their dependence, the difference between the endowments the father got for them and those due to him for them in consequence of the extra £200 will be credited to him on the " assessment day " at the end of the expectation period. But this will profit him nothing, if the shares are then restored, for the credit in respect of the higher income imputed after the expectation period will only take effect if that income comes in. If the income does not come in, what is credited to him in respect of the extra expected contributions will be automatically withdrawn. But, suppose, it may be urged, that the father is allowed to retain the shares until he is 66. In this case there will be no wangle, for he will pay contributions throughout on £1,000 p.a. and the fact that he does not in fact enjoy £200 of this is irrelevant to the solvency of the Fund.

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