It was found that the clinical response of the patient to the haemorrhage or to the transfusion could be well followed by charting the pulse frequency, the blood pressure, the haemoglobin percentage, and the blood-urea values. It was thus possible to obtain an indication of the severity of the haemorrhage, and to tell whether or not the haemorrhage had ceased. Much emphasis has recently been laid on the value of blood-volume estimation in determining these two points (Izod Bennett *et al.*, 1938). These estimations are of great interest, and may be of practical value, but for planning treatment and judging the clinical response it would appear that enough information may be gained by the simple measures described above.

Summary

A series of fifty cases of haemorrhage from simple peptic ulceration is reported. There was only one death, although there were thirteen cases of severe repeated bleeding.

This low mortality rate is attributed to the liberal feeding of the patients and to the use of continuous-drip blood transfusions.

Drip blood transfusion does not provoke further immediate haemorrhage.

After haemorrhage there may be a transient phase of reactive hypertension, but there is no evidence that a drip transfusion produces any abnormal increase in the blood pressure.

It is suggested that a sufficiently accurate indication of the progress of a patient may be gained by charting the blood pressure, pulse frequency, haemoglobin percentage, and possibly the blood-urea values.

My thanks are due to Professor L. J. Witts and Professor R. V. Christie, on whose patients these observations were made, for their interest and assistance in this paper. I am grateful for helpful criticism from Dr. G. Graham, Dr. Geoffrey Evans, Dr. H. L. Marriott, and Dr. R. Bodley Scott.

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The April issue of *The Mission Hospital* has an article on pioneering among the Nuers of Zeraf Island in the Southern Sudan, which reveals how the struggle for existence is being eased by public health activities and, more particularly, by an intensive campaign against mosquitos, flies, and white ants, associated with the prevention of such diseases as trachoma; this work is carried on in dispensaries built of mud and surrounded by a most apathetic and ignorant population. In contrast there comes news from Travancore of the opening of a fine new rural medical mission, replacing a tiny thatched shed, which will now serve as a ward with one or two beds, the scheme being the forerunner of a hospital compound, including a child welfare centre. The uphill work going on in Palestine, in the face of increasing unemployment and poverty caused by political strife, is also described by the medical officer at Nablus, which has been for long a stronghold of Moslem Arabs. These and other articles illustrate how the days of pioneering are not over for medical missionaries, and the possibilities of conducting a large practice with the aid of tents, lorries for hospitals, and river boats for dispensaries are indicated. The jubilee of medical missions as a component part of the Church Missionary Society is due in two years' time.

THE MORTALITY OF CHILDREN IN ENGLAND AND WALES AND GERMANY

A STATISTICAL COMPARISON

BY

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It has long been recognized that study of rates of mortality in different countries at approximately the same levels of sanitary development is an important duty of the intelligence service of a Public Health Department. No two systems of public health services are identical, and variations in rates of mortality may throw light upon their respective efficiencies. These considerations apply particularly to rates of mortality in early life, when it is reasonable to believe that good or bad environmental factors exert their greatest power.

While working in the Statistical Department of the London School of Hygiene and Tropical Medicine I was struck by the excessive mortality from measles which characterized England and Wales as compared with Germany. Although the population of England and Wales is little more than 60 per cent. of that of Germany, in the years 1921–30, 42,450 deaths were assigned to measles in England and Wales and 39,740 in Germany, while in the quinquennium 1931–5 England and Wales had 13,750 deaths and Germany only 7,506. I was, of course, aware that the periodicity of epidemic measles makes comparison of short series of years dangerous, while differences in the practice of certification and classification to single causes in different countries are always stumbling-blocks of international comparisons. But examination of the official rules for classification in use in the respective Government Departments did not suggest that there was any gross fallacy of comparison, and led me to conclude that Sieveking was justified in his remark (*Der öffentliche Gesundheitsdienst*, **2**, 1936–7, p. 380) that measles has not in Germany the serious character which causes the disease to be feared in England. On working out the actual rates of mortality for each of the five years 1931–5, it appeared that, although in every age group the English rate of mortality was the higher, the excess in the age group 1–5 was particularly striking. At the best (1935) it was nearly twice as high as the German rate, at the worst (1931, 1932, and 1934) some five times as high. This especially unfavourable position of children of pre-school age in England and Wales led me to examine the statistics of child mortality in further detail. I propose here to give a summary of the most striking features, reserving a detailed examination for another occasion.

I begin with rates of mortality from all causes in the first year of life. As within the quinquennium 1931–5 there were relatively large variations in the numbers of births, particularly in Germany, the conventional method of statement of mortality rates in terms of annual live births is not quite satisfactory. But as recalculation of the English rates in terms of quarterly births did not seriously affect the results the usual method may stand.

TABLE I.—Rates of Mortality from All Causes per 1,000 Live Births in England and Wales and in Germany

Months of Life	1931		1932		1933		1934		1935	
	E.&W.	G.	E.&W.	G.	E.&W.	G.	E.&W.	G.	E.&W.	G.
0–1	31.6	42.9	31.6	41.9	32.2	41.5	31.3	36.6	30.4	36.2
1–3	10.9	13.9	10.8	14.6	9.9	12.7	8.8	11.8	9.1	11.4
3–6	9.9	13.3	9.2	12.4	8.8	11.9	7.5	11.0	7.7	10.9
6–9	7.4	8.2	7.2	7.9	6.3	7.7	5.8	7.1	5.4	6.9
9–12	6.8	5.5	6.3	5.2	6.0	4.9	5.1	5.0	4.3	4.6

TABLE II.—*Approximate Rates of Mortality from All Causes per 1,000 Living (Persons)*

Age in Years :	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-10
England and Wales	61.4	12.9	5.6	4.2	3.3	2.8	2.4	1.9	1.6	1.4
Germany ..	90.0	9.0	4.5	3.2	2.6	2.2	2.1	1.9	1.6	1.5

notably Halliday (Medical Research Council Special Report Series, No. 120), have called attention to the importance of the housing factor in determining the rate of mortality from measles, and the Chief Medical Officer of the Ministry of Health has discussed the problem of the pre-school child. Although, as he noted, the English rate of mortality at this age has improved enormously during

TABLE III.—*Death Rates from Selected Causes of Death at Different Ages in England and Wales for the Years 1932-5 expressed as Percentages of those in Germany. (Germany = 100 per cent.)*

Age Groups :	0-1								1-4								5-14							
	1932				1933				1934				1935				1932				1933			
	M		F		M		F		M		F		M		F		M		F		M		F	
	Disease group																							
Infectious disease	119	119	95	92	106	112	72	79	208	205	151	205	179	188	105	106	120	119	111	115	63	73	82	76
Nervous system	34	30	36	34	48	45	46	44	77	85	77	85	72	62	69	68	144	127	131	148	129	132	101	110
Respiratory system	113	105	107	106	112	110	98	101	187	199	187	199	170	170	117	125	147	180	133	164	134	133	107	100
Digestive system	83	77	101	94	83	85	81	77	107	125	107	125	115	96	108	107	97	93	64	69	94	86	76	76
All causes (persons)	82		83		89		83		151		140		141		103		121		128		111		94	

The rates are in Table I. It will be found that though down to the sixth month of life the English rates are distinctly favourable they then worsen, and in the last quarter of the first year of life exceed the German rates. The swing is considerable—from a deficit of some 20 to 30 per cent. in the first six months of life to an excess of 10 to 20 per cent. in the last quarter of the first year. The apparent advantage of England and Wales in the year 1935 in the fourth quarter of the first year of life may well be due to the imperfect method of estimating the rate, for in Germany births increased largely in 1934 and 1935.

A comparison of the quinquennial rates at ages 1-5 showed again an advantage for Germany, but I desired to make a finer comparison. As the German data are not subdivided in the same way as the English data, which show rates at ages 1-2 and 2-5 years, I made the following rough experiment. I related the deaths as published in England and Germany in single years of age for the triennium 1932-4 to, respectively, (1) the estimated populations at single years of age as given by the English Registrar-General, and (2) the enumerated populations of the German Census of 1933. One has then the figures of Table II. From the second to sixth year of life the German advantage is substantial; the English rate of mortality in the second year is more than 40 per cent. greater than the German rate, and from age 2 to 6 it is still some 25 to 30 per cent. in excess.

For the whole of the first year the ratio of mortality calculated in this way is, on the other hand, 32 per cent. in favour of England. Owing to this, and especially to the great English advantage in the first months of the first year of life, when mortality is at a maximum, it would still be true, in spite of the relatively high rates in England in later childhood, that the proportion of live-born children surviving to the age of 10 would be slightly greater in England (very approximately in the proportion of 905 to 884). But the change-over is of interest. In the age group 5-15 Germany also has some advantage for the years considered.

In Table III the rates for the principal groups of causes in England and Wales are given as percentages of the contemporary German rates. It will be seen that the English disadvantage in the age group 1-4 inclusive is greatest in the group of infectious diseases and in diseases of the respiratory system. Analysis of the former shows the principal contributors to be measles and whooping-cough.

I am of course aware that it would be dangerous to draw firm conclusions from a comparison restricted to a short series of years in which, as I have said, epidemic diseases have been a main factor of the difference. But the results suggest some reflections. English writers,

the last thirty years, it seems possible that the conditions are capable of further improvement, and that a comparison of administrative systems might be instructive.

RELATION OF VITAMIN D AND MINERAL DEFICIENCIES TO DENTAL CARIES

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In view of the Medical Research Council's recent investigations into vitamin D deficiencies in dental caries the results of the examination of the teeth in ten cases of severe clinical rickets, with radiological confirmation, are reported from an examination of children in the Kangra District of the Punjab, Northern India.

A diet and health survey of this district recently carried out by the Public Health Department and by Dr. D. Curjel Wilson has shown a high incidence of rickets and osteomalacia and definite vitamin D, calcium, and phosphorus deficiencies in the diet of most of the population there. Fifty children with rickets were collected by Miss Edgar of the Canadian Mission Hospital at Palampur and examined clinically and dentally by both of us. A very low incidence of dental caries and hypoplasia was noted. A number of these children were conveyed by car to a neighbouring hospital thirty miles away for radiological examination, and the following results were obtained.

Results of the Investigation

Case 1.—A female child aged 4. Severe clinical rickets. Bowed legs, enlarged epiphyses, head bossing. Skiagram: advanced rickets; irregular enlarged epiphyses; cupping; decalcification. Teeth: twenty deciduous present; number of cavities, two, in $\overline{E}\overline{E}$; arches well formed, no irregularities; hypoplasia (gross naked-eye), nil.

Case 2.—A female child aged 11. Severe clinical rickets. Enlarged epiphyses, curved legs, ribs "rosary." Skiagram: advanced rickets; irregular badly ossified enlarged epiphyses;