THE POPULATION OF INDIA

A Comparative Study

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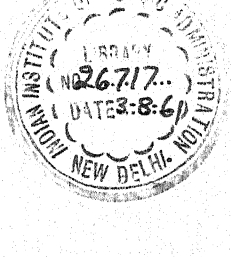

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To
C. L. & B. S.
In the Hope
of a
Lifelong Friendship.

PREFACE.

The object of this book is to examine the influences which have a bearing on the growth of population in India.

The death rate and the rate of infant mortality in India are the highest in the world. India has the largest number per 1,000 of children below ten and the smallest number of persons above fifty. The average duration of life in India is less than in any European country, and what is more remarkable still is the fact that while the expectation of life, or the mean after-life time at certain ages, has increased in European countries, it is decreasing in India. There is no country in the world whose population is controlled by disease to the same extent as the population of India, and in spite of the universality of marriage and the high birth rate the population of India increases more slowly than that of the leading countries of the world (with the sole exception of France.)

What is the explanation of this extraordinary state of things? The high death rate and the shorter duration of life are in part due to the climate of the country, the people's ignorance of the laws of health, the general insanitary condition of towns as well as villages and the evil custom of early marriage, but there is still, as has been said, "an extravagant reaction to conditions of public health" in India. What are the causes of this reaction? Malthus regarded disease as the necessary consequence of over-population. Is India over-populated?

Over-population does not mean the tendency of the population to out-grow the means of subsistence—the sense in which Malthus used the term. The view has been taken in this book that, at the present time, the quantity of human food which a country produces or can acquire is a factor of very little importance in determining the growth of population. The rapid increase of numbers in the leading countries of the world since 1850 and the circumstances

which made it possible show that the growth of population, in general, ultimately depends on economic conditions, of which the supply of food is only one. The solution of the population problem in India thus depends on the solution of the problem of poverty.

Over-population results when population increases more rapidly than national income and wealth. Unfortunately, on account of the lack of reliable statistical material, it is difficult to calculate exactly the national income of India, or the changes in its amount during the past thirty or forty years. But the major portion of India's national income is agricultural, and agricultural income increases slowly. Agriculture to-day, however, is supporting a higher percentage of the people than ever before, and there is very little doubt that per capita real income of ordinary cultivators has not increased—it has probably decreased.

India is not over-populated in the absolute sense, that is we have not reached that stage where, on account of the exhaustion of the soil, or of the possibilities of industrial development, the national income has ceased to grow and therefore the population must cease to expand. The rate of growth in the future, however, must be chiefly determined by the degree of success attained in developing agricultural as well as non-agricultural sources of income and thus augmenting national income per capita.

The book contains numerous references to European conditions. The Indian reader, it is hoped, will find the information given about other countries useful for a comparative study of our population problem. For this information I have been forced to rely on second-hand sources, but these sources are excellent—Handwörterbuch der Staatswissenschaften, Conrad's Statistik and Georg von Mayr's Bevölkerungsstatistik.

Lahore, Maclagan Road. BRIJ NARAIN.

January 16, 1925.

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MOVEMENT OF THE POPULATION

Real increase of population, 1872—1921.

The first regular census of the population of India was taken on the 17th February, 1881. Previous to that date there had been enumeration of the population in the majority of the provinces and States of India, but this enumeration had been effected at different times, and by independent agencies. Since 1881 four more censuses have been taken, in 1891, 1901, 1911, and 1921. The growth of the population between 1872 and 1921 is shown by the following statement:—

Census of Population		Variation per cent. since previous census
1872	206,162,360	—
1881	253,896,330	+ 23·2
1891	287,314,671	+ 13·2
1901	294,361,056	+ 2·5
1911	315,156,396	+ 7·1
1921	318,942,480	+ 1·2

According to these figures the increase in population in 1921, as compared with 1872, was 54·7 per cent., or the average increase since 1872 was at the rate of about 5·5 per cent. The real increase, however, has been considerably less than this figure owing to (*a*) the additions of area and population included at each census, and (*b*) the progressive increase in the accuracy of enumeration from census to census. Allowance

is made for these factors in the following table:—

Period	Increase due to		Real increase of population. Millions	Total. Millions	Rate per cent. of real increase.
	Inclusion of new areas. Millions	Improvement of method. Millions			
1872-81	33·0	12·0	3·0	48·0	1·5
1881-91	5·7	3·5	24·3	33·5	9·6
1891-01	2·7	·2	4·1	7·0	1·4
1901-11	1·8	—	18·7	20·5	6·4
1911-21	·1	—	3·7	3·8	1·2
Total	43·3	15·7	53·8	112·8	20·1

Thus the real total increase of population in 49 years between 1872 and 1921, was about 54 millions, or 20.1 per cent.

Irregular movement of the population.

It will be seen that the rate of increase in the different periods was very unequal. The figures show a period of comparatively rapid increase following one of an almost stationary population. If a curve were constructed to illustrate the movement of the population, it would be seen to rise and fall alternately. What is the explanation of this peculiar movement of the Indian population?

The growth of the population in India is determined not merely by the relation between normal birth and death rates, but by abnormal causes which affect this relation, as famine and disease.

1872-81. Effect of famine.

The famine of 1876-78 falls in the first period. This famine severely affected southern India, particularly the Madras Presidency, while its effect was felt generally throughout the country. The severity of the famine in Madras may be judged from the fact that in five districts of the province where famine was intense, the population in 1881, as compared with

1871, decreased 25·12 per cent.; in two districts, where it was moderate, the decrease in population was 3·62 per cent., while in Shimoga district, where it was slight, the percentage increase was ·15.

The effect of a famine in checking the growth of numbers is not confined to the famine zone. The resulting high prices and scarcity check rapid reproduction in districts which have not been affected by famine. "It may safely be accepted", wrote the Census Commissioner for 1881, "that when food is scarce there are fewer births"—this may be due to prudence, deliberate or instinctive, or physiological causes. "It remains stamped on the age tables" goes on the Census Commissioner, "that in 1876-78 very much fewer children were begotten throughout the (Madras) Presidency than in previous or subsequent years, and this is true of the so-called non-famine districts, although to an obviously slighter extent than of the famine districts".*

An interesting attempt was made in 1881 to determine the average rate of increase of population in the different provinces, apart from the effects of famine. The calculations were based on the figures of the male population for the censuses held in the provinces prior to 1881. Only the male population was considered, because the enumeration of females at previous censuses had been extremely defective. The rate of increase amongst males and females is on the average practically identical and, therefore, the results of the enquiry were valid for the whole population. The mean annual rates of increase per cent. for the different provinces were found to be as follows:—

Madras	.6
Bengal	.8
Bombay	.78
Punjab	.6
Central Provinces	.8
North-West Provinces	.32

* Census Report, 1881, p. 457.

These rates agreed fairly closely with the normal rates of increase as calculated by the actuary in 1881:—

Bengal	.8	per cent.	per	annum.
Madras	.8	,,	,,	,,
Bombay	.8	,,	,,	,,
Punjab	.6	,,	,,	,,
North-West Provinces	.32	,,	,,	,,

The Census Commissioner explained the slow rate of increase of population in the North-West Provinces by saying that the population which these provinces had to sustain was already very dense, and he thought that in these provinces the limit of expansion had been reached "at least under present conditions".* He pointed out that at the rate of increase of 8 per mille per annum the population of Madras, Bombay, and Bengal would double itself in about 86 years, while the population of the North-West Provinces, at its low rate of increase, would require 200 years to double itself.

1881-91. Period of recovery.

The period 1881-1891 was one of recovery. It is generally seen that the birth-rate rapidly increases after any period of exceptional mortality, due to war, diseases or famine. Famine mortality is high among the very old, the very young and those of a weak constitution. If then a period of famine is followed by a period of good crops, the population should increase rapidly as it contains an unusually high proportion of healthy persons at the reproductive ages. For example, the population of Madras and Mysore, both of which had suffered heavily in the famine of 1876-78, increased 15·7 and 18·1 per cent. respectively in the decade 1881-1891, and after the famines of 1897 and 1900, the population of the Central Provinces and Berar increased 17·9 per cent. in the decade 1901-11. We shall see, however, that the rate of increase of population in India as a whole, even under the most favourable conditions, is less rapid than in the leading Western countries.

* Census Report, 1881, p. 172.

The real increase of population in the decade 1881-1891 was 9·6 per cent. This is the only decade between 1872 and 1921 which was free from any exceptional calamity.

1891-01. Famine and plague.

Mr. Baines, the Census Commissioner for 1891, had prophesied that the rate of increase in the period 1881-91 was not likely to be maintained. After the good seasons of this decade he expected a check to the growth of population on account of famine. As it turned out, agricultural conditions in the decade 1891-1901 were adverse. There was scarcity over a considerable area in Madras and Bombay in 1891-92, and parts of Behar were also affected. There were extensive crop failures in 1895 in the southern districts of the United Provinces, while in the following year famine conditions prevailed in the United Provinces, Central Provinces and Berar and parts of Madras, Bombay, Bengal, the Punjab, Rajputana, Central India and Hyderabad. The area affected was 300,000 sq. miles with a population of nearly 70 millions. On the heels of this famine there followed the famine of 1899-1900 which was even more disastrous. It is estimated that the total mortality due to these two famines was about 5 millions.

This period also saw the appearance of plague in Bombay in 1896. The epidemic rapidly spread in the Bombay Presidency and in some other parts of India, and by the date of the Census had caused a mortality of nearly a million.

Plague and famine checked the rate of growth of population. As the Census Commissioner for 1901 remarks: "In a period which has witnessed two great famines of the century and the appearance of a new and deadly disease the wonder is not that the pace at which the population has grown is less than it was during the previous ten years, when the rate of progress was more rapid than usual, but that there should have been any increment at all."*

* Census Report, 1901, p. 84.

The real increase of population in this period was 1·4 per cent.

Economic conditions of the decade.

Apart from famine, economic conditions of the decade were favourable to progress. The railway mileage open to traffic increased from 17,000 in 1890-91 to 25,000 in 1900-01; 43,000 miles of canals were in operation in 1901 as compared with only 9,000 ten years previously. There was also a steady development of various mining and manufacturing industries in the decade. The Census Commissioner regarded the outlook for the future as hopeful, unless famine again supervened. He did not think that India had already more inhabitants than it could support. There was considerable room for expansion. While in particular parts of the country (parts of Behar and in the east of the United Provinces) the pressure on the soil was beginning to be felt, this was not true of the country as a whole. About two-thirds of the population of India occupied only a quarter of the whole area, and the remaining one-third of the population was scattered over three-quarters of the area which nowhere contained as many as 200 persons to the square mile. It was also seen that the greatest increase of population had occurred in districts which in 1891 had already a density of from 500 to 600 persons per square mile, and the smallest increase in districts which had a population of 100 to 200.

1901-11. "Moderate agricultural prosperity."

The next decade, 1901-1911, was free from any serious wide-spread famine, though crop failures occurred over a wide area in 1907, extending from Behar to the Punjab and Bombay, and famine conditions prevailed in the United Provinces and in a few districts elsewhere. This period has been characterised as one of "moderate agricultural prosperity" for the country as a whole.

The real increase of population in this decade was 6.4 per cent. It would have been greater but for disease. Mala-

rial fever took a heavy toll of mortality in the irrigated tracts of Eastern and Central Punjab, and the Ganges-Jamuna Doab in the United Provinces, where in 1908 alone the reported mortality from "fevers" was nearly two millions. The Punjab, the United Provinces and Bombay suffered severely from plague; the total plague mortality was estimated to be 6·5 millions, of which over one-third occurred in the Punjab.

1911-21. Influenza.

The outstanding feature of the last decade, 1911-1921, is, of course, the influenza epidemic. The war falls in this period, but its effect on the growth of numbers was negligible. The actual number of death casualties among the officers and ranks of Indian army units and labour corps was 58,238. The maximum number serving out of India in combatant and labour units at any one time between 1914 and 1919 was approximately Indian troops 250,000, labour corps 230,000, total 480,000; the number about the time of the census was troops 105,000, labour corps 20,800, total 125,800.

Economic conditions were favourable till 1917. The monsoon of 1918 was feeble, and that of 1919 was not much better. The outturn of the chief food crops declined heavily and prices rose. Influenza came at a time of widespread crop failures. It affected every part of India and "wiped out in a few months practically the whole natural increase in the population for the previous seven years."

Influenza mortality.

The number of deaths due to influenza in the area under registration was about 7,100,000 in 1918 and 1⅓ millions in 1919, giving a total recorded mortality of 8½ millions. But it is certain that the total influenza mortality was much greater than this, for on account of the complete break-down of the reporting staff the registration of vital statistics was suspended in 1918, and when later the figures were recon-

structed, there were many omissions, particularly as regards women. The figure given above also does not take account of the mortality in areas where there was no registration, and thus neglects one-fourth of the total population. On the whole it is estimated that the total mortality from influenza was between 12 and 13 millions for India. The following figures, though imperfect and incomplete, enable us to realise the severe effect of the epidemic on the growth of numbers:

Province.	Average yearly excess of births over deaths per mille, 1911—1917.	Average yearly excess of deaths over births per mille, 1918—1920.	Variation per cent. 1911—1921.
Assam	5.4	— 9.4	+13.3
Bengal	4.8	— 5.5	+ 2.7
Behar & Orissa . .	9.1	— 9.1	— 1.4
Bombay	4.7	—19.8	— 1.8
Burma	8.5	— .1	+ 9.1
C. P. & Berar . .	11.8	—23.1	—
Madras	8.5	— 3.1	+ 2.2
N. W. F. Province . .	8.3	—11.1	+ 2.5
Punjab	12.5	— 5.0	+ 5.7
United Provinces . .	10.6	—17.8	— 3.1

Heavy mortality in rural areas. The Punjab.

The epidemic affected rural districts more severely than urban districts. In the Punjab the mortality in urban areas was only 36 per mille as against 51 per mille in rural areas. Mortality was under 5 per cent. among Europeans, about 6 per cent. among Indians of the higher classes who were able to obtain medical attendance, and over 50 per cent. among the people in rural districts. The heavy mortality in rural areas was due to the lack of medical assistance and improper and inadequate provision of diet, clothing, etc. in illness.*

* "From the middle of October to the middle of November" says the Census Commissioner for the Punjab, "the state of the Province beggars description. Hospitals were choked, dead and dying lay by the sides of the roads, burial grounds and the burning ghats were strained beyond their capacity and corpses lay awaiting burial and cremation. Terror

The Punjab suffered severely from influenza but it still suffered less than the United Provinces and the Central Provinces. At the end of the decade, the population of the United Provinces was found to have decreased 3.1 per cent. and of the Central Provinces 0.3 per cent. as compared with 1911. On the whole the population of India increased by 1.2 per cent.

How does the rate of growth of the population of India compare with that of other countries?

Europe. Slow increase before the 19th century.

For European countries reliable statistics of population are available since 1800. It is well known that the population of Europe was increasing very slowly before the 19th century. The growth of the population was checked by epidemics and war. With the beginning of the 19th century the conditions completely changed and the population began to increase rapidly. It is estimated that the population of Europe grew from 187 millions in 1800 to 447 millions in 1910, an increase of 267 millions in 110 years, the rate of growth being 7.9 per ~~cent.~~ mille per annum.

Rapid increase, 1800—1910.

The rate of growth became particularly rapid about the middle of the 19th century. For example, the population of England and Wales increased from 9.2 millions in the beginning of the 19th century to 18 millions in 1850, 32.5 millions in 1900 and 36 millions in 1911. Ireland shows a decrease, but this is due to special causes. But even the Irish population increased from 5.5 millions in 1800 to 8,295,000 in 1845, after which a steady decrease in numbers began, so that the population was reduced to 4,390,000 in 1911. Emigration wholly accounts

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and confusion reigned supreme, the postal and telegraph services were disorganised, and a harrassed and depleted medical service struggled valiently, but ineffectually to cope with the disease. During this period large numbers of the educated classes earned the gratitude of the sufferers by devoted self-sacrifice and social service, while medical students throughout the province rendered every assistance within their power.'' Punjab Census Report 1921, p. 60.

for this decrease. The population of Germany increased from 24.5 millions in 1800 to 35 millions in 1850 and about 65 millions in 1910. The increase in Russia was still more remarkable—from about 38 millions in 1800 to 61 millions in 1850 and 131 millions in 1910. The figures for Russia are not absolutely reliable, but there is no doubt that the population of Russia has increased very rapidly since 1800.

The table given below shows the growth of the population in European countries between 1800 and 1910:—

Population in thousands at the end of the year§

	1800	1850	1900	1910	Average annual Increase, 1800—1910, per 1,000 of the population.
German Empire	24,500	35,409	56,367	64,926	8.9
Austria	13,300	18,054	26,150	28,571	7.0
Bosnia and Herzegowina	1,000	1,150	1,591	1,898	5 8
Hungary	10,000	13,300	19,254	20,886	6.7
Italy	18,125	23,900	32,449	34,671*	5 9
Spain	11,500	14,500	18,618	19,951	5 0
Portugal	2,920	3,450	5,423	5,960*	6.5
Switzerland	1,750	2,400	3,325	3,753	7.0
France	26,900	34,907	38,961	39,192	3.4
Luxumburg	160	184	236	260	4.4
Belgium	3,000	4,383	6,693	7,423	8 3
Netherlands	2,150	3,096	5,179	5,858†	9.2
Denmark	925	1,431	2,449	2,757	10 0
Sweden	2,347	3,483	5,136	5,522	7.8
Norway	883	1,400	2,240	2,358	9 0
Finland	1,040	1,637	2,563	3,115	10 0
England and Wales	9,250	18,000	32,527	36,070*	12.3
Scotland	1,675	2,915	4,472	4,761*	9.5
Ireland	5,500	6,696	4,458	4,390*	—2.0
Russia	38,000	61,000	103,280	130,820	11.3
Servia	900	1,250	2,493	2,912	10.7
Roumania	2,800	4,350	5,956	7,235	8.7
Greece	1,000	1,450	2,509	2,632‡	9.1
Montenegro	200	220	250	250	2.0
Turkey with Bulgaria	7,300	8,500	9,874	10,468	3.3
Smaller States	238	377	523	838	11.5
EUROPE	187,363	267,442	392,988	447,477	7.9

*Census of 1911. †Census of 1909.
‡Census of 1907. §H. d. S. Bd. II, p. 689.

It is interesting to note that in the beginning of the 19th century the population of France exceeded that of any European country with the exception of Russia. Even in 1846 France had a population of 34,546,975, as compared with Germany's 34,396,055. But four years later (in 1850) the German population exceeded the French slightly, and since then the difference has steadily increased. In 1910 Germany had a population of about 65 millions as compared with France's 39,192,000.

Growth of population in India and Europe compared, 1870—1910.

The following table compares the rate of growth of the population in India with that in other countries between 1870 and 1910. As we have seen, earlier figures for India are not available.

Figures in thousands.

	1870.	1910.	Increase per cent.
India	265,056	315,156	18.9
Germany	40,850	64,926	59
Austria	20,600	28,571	39
Hungary	15,620	20,886	33.7
Italy	26,650	34,671	30
Spain	16,330	19,951	22
France	36,765	39,192	6.6
Belgium	5,021	7,423	47.8
Netherlands	3,616	5,858	62
Denmark	1,799	2,757	53.2
England and Wales . .	22,800	36,070	58.2
Russia	75,200	130,820	73.9
Roumania	5,000	7,235	44.7
Europe	307,655	447,477	45.4

It will be seen that with the exception of France the rate of growth in India was less than that of any European country.

The growth of the population during each decade between 1880 and 1910 in various countries of the world is shown below:—

	1880-1890	1890-1900	1900-1910	1880-1910
India	9.6	1.4	6.4	17.6
Germany . .	9 1	14	15.2	43.5
Austria	7.9	9.4	9.2	29
Hungary . .	11	10.2	8.5	32.7
France	1.8	1.6	1.6	5.1
Italy	14.1†	8.1	6.8	21.8‡
Great Britain . .	8.1	10.2	8.4	29.1
Canada	11.7	11 1	34.2	66.6
Australia . .	41	18.9	18	98
Newzealand . .	28	23.3	30.4	105.7
U.S.A.	25.5	20.7	21	83.4
Japan	12.6	10.8	13.7	41.9

The growth of the population between 1881—1911 in other states of Europe was as follows:—

		Increase per cent.			Increase per cent.
1.	Servia . .	64	7.	Belgium . .	34.5
2.	Roumania . .	51.5	8.	Switzerland . .	32.6
3.	Netherlands . .	45	9.	Norway . .	24.4
4.	Finland . .	40.8	10.	Sweden . .	20.9
5.	Denmark . .	38.5	11.	Spain . .	17
6.	Greece . .	36			

Further, the population of Russia increased 29 per cent. between 1897—1911; of Brazil between 1890—1908, 43 per cent., and of Argentine, between 1895—1914, 99 per cent.

On the whole it appears that the increase of population was most rapid in over-seas countries which receive immigrants, like Argentine, the United States and the British

† 1882-1901.
‡ 1882-1911.
See H. d. S. Bd II p 698.

Colonies. Among European countries, the smaller States, Servia and Roumania, show the largest increase.

The growth of population is slowest in France. In the countries of Central and Eastern Europe, Greece and in Japan there has been a rapid growth of population.

The war period.

The growth of the population in belligerent countries was suddenly checked by the war. The war, as we shall see, also affected the growth of numbers in neutral countries.

The war affected the growth of population both directly and indirectly. Indirectly it caused a fall in the birth-rate and in the number of marriages, and an increase in the death-rate, apart from the direct losses due to war casualties.

Fall in the birth-rate.

The fall in the birth-rate for 51 months (from May 1915 to the end of July 1919) as compared with the pre-war year 1913 for the six leading belligerents* amounted to 40 per cent., or a little more than 11 millions. This figure exceeds death casualties during the war. The whole of this loss, however, cannot be regarded as due to the war. In some countries, as in England and Germany, the birth-rate was falling before the war; the annual average number of births decreased in Germany from 2,004,000 in 1902-05, to 1,876,000 in 1910-13, and 1,819,000 in the year 1914; and in Great Britain and Ireland from 1,176,000 in 1902-05 to 1,106,000 in 1910-13 and 1,102,000 in 1914. Allowing for a normal decrease in birth-rate during the war period, it is estimated that the war is responsible for a fall in the birth-rate of 38 per cent. or a decrease in actual numbers of about 10½ millions.

Among the neutral States of Europe the decrease was greatest in the case of Switzerland. The births were 15-16 per cent. less than what might have been expected under

* Germany, Belgium, former Austria Hungary, France, Italy and Great Britain and Ireland.

normal circumstances. Switzerland was not involved in the war, but it had to make considerable preparations for defence in case of aggression

Death rate among civil population.

The increase in the death-rate among the civil population is shown by the following index-numbers:—

	1913	1915-18 (annual average)
Belgium	1,000	1,147
Germany	1,000	1,076
German Austria	1,000	1,155
Bohemia-Mähren	1,000	1,078
France	1,000	1,063
Italy	1,000	1,255
Great Britain & Ireland	1,000	1,065
Total	1,000	1,112

The increase in death-rate was thus 11 per cent. But the actual increase was greater than is indicated by this figure for two reasons: (1) on account of the decrease in the number of births, the actual number of deaths among infants decreased and, (2) the number of civil persons of military age was reduced by more than half on account of the call to the colours. If we consider the number of deaths among civil persons of more than one year in age, it is found that the increase in the death-rate in 1915-18 as compared with 1913 was 25 per cent. in the case of Germany, 30 per cent. in German Austria and 10 per cent. in France, while the percentage increase in the death-rate for the total civil population of these three countries was only 8, 15, and 6 respectively.

The increase in the death rate was particularly noticeable in 1918. This was due to the influenza epidemic. The table given below shows that the increase amounted to no less than 35 per cent. in 1918:—

	1913	1914	1915	1916	1917	1918
Belgium (without Westflanders)	1,000	1,029	941	960	1,185	1,502
Germany	1,000	1,047	1,015	956	1,077	1,255
German Austria	1,000	975	1,101	1,064	1,149	1,305
Bohemia. etc	1,000	990	1.055	978	993	1,284
France (77 Departments) ..	1,000	1,062	1,051	979	992	1,230
Italy	1,000	969	1,116	1,087	1,059	1,759
Great Britian and Ireland ..	1,000	1,013	1,103	996	982	1,178
TOTAL ..	1,000	1,021	1,062	999	1,041	1,347

The increase in the death-rate during the war was not confined to the belligerent countries of Europe. The neutral states also show a considerable increase, which was in most cases due to the influenza epidemic:—

	The annual average number of deaths. 1914.	1915—18.
Denmark	35,900	38,700
Finland	50,700	65,200
Netherlands	77,700	91,600
Norway	32,900	36,100
Sweden	78,200	85,600
Switzerland	53,600	57,600
Spain	450,000	514,000

Death casualities during the war.

The following table shows death casualties during the war:

	Number of death casualties.	Per 1,000 of the population of 1914.	Per 1,000 men of the age 20-45.
Belgium ..	34,000	4.4	25
Germany ..	1,809,000	26.7	149
Austria ..	812,000	27.7	166
Hungary ..	645,000	30.1	187
France ..	1,325,000	33.4	182
Italy ..	563,000	15.7	101
Great Britain and Ireland ..	744,000	16.1	88
Australia ..	59,000	11.9	60
New Zealand ..	16,000	14.6	73
Canada ..	57,000	7.1	33
Total ..	6,064.000	23.2	122

It will be seen that the heaviest losses were suffered by France, Germany, and Austria-Hungary, 15 to about 19 per cent. of the men of military age.

Total decrease in numbers in certain countries.

The total decrease in numbers due to the decrease in births and increase in deaths among the civil and military population in the case of four leading belligerents is shown below:—

	Decrease in births from May 1915 to July 1919.	Per 100 of the population 1914.	Increase in deaths 1914—18.	Per 100 of the population 1914.	Total decrease.	Per 100 of the population 1914.
Germany . .	3 590,000	5 3	2,160,000	3.2	5,750,000	8 5
France . .	1,390,000	3.5	1,540,000	3.9	2,930,000	7.4
Italy . .	1,300,000	3.6	1,240,000	3.4	2,540,000	7
Great Britian and Ireland . .	840 000	1.8	925,000	2	1,765,000	3.8
TOTAL . .	7,120,000	3.8	5,865,000	3.1	12,985,000	6.9

The total loss amounted to about 13 millions, or about 7 per cent. of the total population of these four countries. Germany suffered most (8.5 per cent.) and Great Britain and Ireland least (3.8 per cent.).

Marriages.

During the war period the number of marriages performed in Germany, German-Austria, France, Italy and Belgium seriously decreased. It is estimated that the decrease amounted to 44½ per cent. for these countries as compared with 1913, or no less than 2,200,000 fewer marriages were performed than would have been normally the case. In Great Britain and Ireland the number of marriages in the war period was 4.4 per cent. greater than in 1913.

There was a sudden increase in the number of marriages at the end of the war, the increase in 1919, as compared with

1913, being 59 per cent. for Belgium, 80.3 per cent. for 77 Departments of France, 18.9 per cent. for Italy, 28.7 per cent. for Great Britain and Ireland, and 75 per cent. for Germany.

The present position.

The present position of the population of the principal countries of the world is shown by the following table:

	Year of Census.	Population in thousands.	Year of Census.	Population in thousands.	Decrease (—) per cent., 1910—20.	Percentage Increase (+) or Decrease (—) in the decade 1900—10.
*Germany . .	1910	59,263	1919	61,436	+3.5	+15.2
Belgium (1) . .	1910	7,424	1921	7,459	+ .5	+10.9
France (1) . .	1911	39,602	1921	37,690	—4.8	+ 1.6
Italy (1) . .	1911	34,671	1921	37,270	+7.5	+ 6.8
Great Britain (2) . .	1911	40,831	1921	42,767	+4.7	+ 8.4
Canada	1911	7,207	1921	8,772	+21.7	+34.2
Australia . .	1911	4,455	1921	5,426	+21.8	+18
New Zealand . .	1911	1,008	1921	1,218	+20.8	+30.4
U. S. A. . .	1910	91,972	1920	105,711	+14.9	+21
German Austria . .	1910	6,355	1920	6,131	—3.5	. .
Tschechoslowakei . .	1910	13,597	1921	13,596	. .	. .
Former Austrian Poland	1910	8,193	1920	7,610	—7.1	. .
Former German Poland	1910	3,855	1920	3,892	+ .9	. .
Bosnia, Herzegowina	1910	1,898	1920	1,877	—1.2	. .
		Neutral.				
Denmark . .	1911	2,757	1921	3,104	+12.6	+12.6
Netherlands . .	1909	5,858	1920	6,841	+16.8	+13.1
Norway	1910	2,392	1920	2,646	+10.6	+ 5.3
Sweden	1910	5,522	1920	5,904	+ 6.9	+ 7.5
Switzerland . .	1910	3,765	1920	3,886	+ 3.2	+12.8

As regards the five European belligerents it will be seen that the population of France actually decreased in the last decade, while in the other countries, with the exception of Italy

*Does not include territory which Germany has lost according to the terms of peace.

(1) Territory of 1914.

(2) Without Ireland.

See H. d. S. Bevölkerungswesen, pp. 724—725.

the increase in population was much below the increase under normal conditions. The more than normal increase in the case of Italy is due to her direct and indirect gains on account of immigration. Before the war Italy used to send out emigrants in large numbers to foreign countries.

The smaller States of Central Europe have lost heavily, the greatest sufferer being former Austrian Poland. It is well known that Galacia suffered terribly in the war.

Among the neutral States of Europe the increase in Switzerland was much below the normal. This was due to the fall in the birth-rate, which has been referred to above.

The growth of population in the British Colonies and the United States is irregular, as it is largely affected by artificial factors as immigration. In the last decade the population of Canada and New Zealand increased less rapidly than in the preceding decade. The losses suffered by them in the war and the fall in the birth-rate in these two countries were on a much smaller scale than in European countries.

When we compare the growth of the population in India in the last decade with that in other countries it is found that in spite of the abnormal conditions existing in Europe and the direct and indirect effects of the war, Germany, Italy, Great Britain and each of the larger neutral States of Europe show a larger increase in population than India (1.2 per cent). As we have seen, the effect of the war on the population of India was so slight as to be negligible, but disease was more terrible in its consequences for the population of India than the war for Europe. The number of deaths by influenza alone in 1918-19 (about 13 millions) far exceeded death casualties of belligerent countries during the war; it exceeded the total losses suffered by Belgium, Germany,

Conclusion: Slower growth of population in India as compared with European countries.

Austria, Hungary, France, Italy and Great Britain during 51 war months on account of the fall in the birth-rate, and it about equalled the total losses of Germany, France, Italy and Great Britain on account of the decrease in births during war months, and the increase in deaths among the civil as well as the military population from all causes during 1914-18.

We have to remember that the growth of the population of the five European belligerents during the war (with the exception of Italy) was much below the normal. The difference between the actual growth and the normal growth is estimated to be 8.9 per cent. for Germany, 10.2 per cent. for Belgium, 6.4 per cent. for France and 5 per cent. for Great Britain. The normal rate of growth for the smaller States of Central Europe is estimated to be 8-10 per cent. When we take these figures into consideration we realise how very slow is the rate of increase of the population in India. The war was an exceptional circumstance which suddenly checked the growth of the population in Europe. Disease in India, however, cannot be regarded as an exceptional factor. During the last 40 years, only one decade, 1881-91, was free from disease. In every other decade plague or "fevers" have claimed a large number of victims.

Difficulty of determining the normal rate of growth for India.

While it is not difficult to determine the normal rate of growth of population for European countries, it is extremely difficult to do so for India on account of famine and disease. The period 1881-91 is sometimes regarded as normal, but the fact that it was free from disease and famine makes it, and the 9.6 per cent. increase of population in this period, somewhat abnormal. All that can be said is that the population of India, under favourable conditions, may be expected to increase at that rate. But our experience during the last three decades shows that the "favourable

conditions" which are assumed for that rate of growth cannot always be expected to exist. The rate of growth under normal conditions will therefore be less than 9.6 per cent. in the decade.

In this connection the difference between the birth and death rates as calculated by the actuary for certain provinces in certain decades is interesting :—

Province.	1881-1891.	1901-1911.
Bengal	7.0	7.3
Bombay	13.9	5.2
Burma	—	11.1
Madras	13.3	8.5
Punjab	9.8	5.7
Central Provinces . .	6.5	0.6
Combined Provinces . .	—	8.2

"It is perhaps not an unreasonable estimate", says the Census Commissioner for 1921, "to place the probable natural increment in India at the present stage of development, and apart from exceptional calamities, at between 7 and 8 per cent. in the decade."*

A 7 to 8 per cent. rate of growth in a decade would be greater than the normal rate of growth of the population in France and about equal to the rate of growth in Italy, Spain, Portugal, Sweden and Norway. It will be less than the rate of growth in the countries of Central Europe, Great Britain, British Dominions and the United States.

The conclusion, however, which emerges from the study of facts given in this Chapter is that before the war Indian population was increasing more slowly than that of any country in the world excepting France, and that during the last decade, as compared with the neutral States of Europe, the rate of growth in India, on account of the influenza epidemic, became slower still.

*Census Report for India, 1921, p. 48.

II

BIRTH AND DEATH RATES, AGE DISTRIBUTION, DURATION OF LIFE AND CAUSES OF DEATH

Indian birth and death rates are the highest in the world.

We have considered the tendency of the Indian population to increase more slowly than the population of European countries. What are the causes of this tendency?

The rate of growth is determined by the relation between birth and death rates and migration. Migration is not an important factor in determining the growth of numbers in India. The explanation of the slower movement of the Indian population must therefore lie in the relation of births to deaths.

When we compare birth and death rates in India with those in other countries it is found (1) that both are higher than in other countries, and (2) that while in other countries both birth and death rates show a tendency to fall, in India they show no such tendency.

It has been often pointed out that the reported birth and death rates in India are not accurate. The difference between birth and death rates estimated by the actuary (Mr. Acland) at the census of 1911 and the reported rates amounted to 7 or 8 omissions per mille for births, and slightly less for deaths. In using the reported birth and death rates we have therefore to bear in mind that the actual birth and death rates are higher than the reported rates. The records of births and deaths, however, though incomplete, are not useless. As is pointed out by the Census Commissioner for 1921, "Except for progressive improvement in urban areas and occasional breakdowns during epidemics,

the errors are more or less constant from year to year,"* and while not placing absolute reliance on the figures, we may use them for purposes of comparison.

Rise in the birth and the death rate in India.

The following table shows the ratio of births and deaths per 1,000 of the population from 1885 to 1920:—

Year.	Ratio of births per 1,000	Ratio of deaths per 1,000	Year.	Ratio of births per 1,000	Ratio of deaths per 1,000
1885	36.74	26.37	*1904*	40.87	33.05
1886	34.97	25.51	*1905*	39.14	36.14
1887	35.92	28.03	*1906*	37.36	34.73
1888	35.59	26.41	*1907*	37.66	37.18
1889	35.3	28.21	*1908*	37.70	38.21
1890	36.47	30.12	*1909*	36.65	30.91
Average 1885-90	35.83	27.44	*1910*	39.52	33.20
1891	35.05	28.4	*Average 1901-10*	38.18	33.94
1892	31.54	32.51	*1911*	38.58	32.01
1893	35.15	25.75	*1912*	38.95	29.71
1894	34.91	33.98	*1913*	39.37	28.72
1895	34.57	28.94	*1914*	39.61	30.00
1896	36.06	32.04	*1915*	37.82	29.94
1897	33.98	36.03	*1916*	37.13	29.10
1898	34.33	26.56	*1917*	39.33	32.72
1899	42.16	30.01	*Average 1911-17*	38.68	30.31
1900	36.58	38.91	*1918*	35.35	62.46
Average 1891-00	35.43	31.31	*1919*	30.24	35.87
1901	34.59	29.45	*1920*	32.98	30.84
1902	39.38	31.67	*Average 1911-20*	36.93	34.13
1903	38.96	34.91			

It will be seen that the birth-rate rose from 35.83 to 38.18 and the death-rate from 27.44 to 33.94 between 1885-90 and 1901-1910. The fall in the birth rate and the rise in the death-rate in 1911-20 as compared with the preceding decade are due to the influenza epidemic of 1918-19. The average birth and death-rates for the period 1911-17 were 38.68 and 30.31 respectively.

*Census of India Vol. I Report p. 15.

Fall in European countries.

In European countries both the birth and death rates have been falling for a long time. This is well brought out by the following table:

Per 1000 inhabitants.

	Born living.			*Died.*		
	1881-1890	1891-1900	1901-1910	1881-1890	1891-1900	1901-1910
Germany . .	36.8	36.1	32.9	25.1	22.2	18.7
Austria . .	38	37.4	34.7	29.6	26.7	23.3
Hungary . .	43.9	40.5	37	32.4	29.8	25.7
France . .	23.9	22.1	20.6	22.1	21.5	19.4
Italy . .	37.7	35	32.7	27.3	24.2	21.6
England and Wales	32.5	29.9	27.2	19.2	18.2	15.4
Scotland . .	32.3	30.2	28.4	19.2	15.5	16.6
Ireland . .	23.4	23.1	23.2	17.9	18.3	17.4
Servia . .	44.9	41.6	38.9	25.2	26.8	23.4
Roumania . .	41.4	40.6	39.8	27.5	29.1	25.8
Bulgaria . .	—	39.3	41.5	—	25.8	23.2
European Russia . .	48.6	48.7	46.7	34.3	33.8	29.9
Netherlands . .	34.2	32.5	30.5	21	18.4	15.2
Finland . .	35	32.2	31.1	21.1	19.7	17.9
Denmark . .	31.9	30.2	28.6	18.6	17.4	14.2
Belgium . .	30.2	28.9	26.1	20.6	19.1	16.4
Switzerland . .	28.3	28.1	26.9	21	19	16.7
Norway . .	31	30.3	27.5	17.1	16.2	14.2
Sweden . .	29.1	27.1	25.8	16.9	16.4	14.9
Spain .	36.2	34.8	34.4	31.7	29.5	25.2
Portugal . .	—	30.6	31.7	—	21.3	20.2
Japan . .	27.2	29.8	32	19.9	20.9	20.7
India . .	*35.8	35.4	38.2	*27.4	31.3	33.9

* For the period 1885-1890.

For Australia and New Zealand the following figures are available:—

	Born Living.				*Died.*			
	1881	1891	1901	1910	1881	1891	1901	1910
Australia . .	36	35	26.9	26.7	15	15	12	8.4
New Zealand . .	38	29	26	26	11	10	10	10

There is no country in this table, with the exception of India, which shows an increase in the death rate. Only four countries, India, Japan, Bulgaria and Portugal, show an increase in the birth-rate in 1901-10 as compared with 1881-90. The birth-rate in Servia, Bulgaria, Roumania and

European Russia exceeds the reported Indian birth-rate, but in view of the fact that the actual birth-rate in India is higher than the reported birth-rate, the birth-rate in India is probably the highest in the world. The average birth and death rates for India according to the figures for provinces as estimated by the actuary in 1911 were 43.9 and 38.5 respectively.

Infant mortality: decrease in European countries.

It is well known that countries with high birth-rates have a high rate of infant mortality. Infant mortality in India is the highest among the leading countries of the world. Fifty years ago the rate of infant mortality was very high in European countries, even as high as in India at the present time. For example, in 1872-75 the birth-rate per 1,000 of the population in Germany was 41.6 and infant mortality per 1,000 children born living 244. But during the course of the last 50 years infant mortality has constantly fallen in European countries, the fall in 1908 as compared with 1871-75 for various countries being as follows:—

	Fall per cent. in 1908 as compared with 1871-75*
Württemburg . .	41.6
Bavaria . .	29.7
Saxony . .	30.0
Baden . .	35.7
Austria . .	20.3
Netherlands . .	38.4
Prussia . .	15.6
Italy . .	15.4
Switzerland . .	44.0
France . .	21.5
England and Wales	23.1§
Belgium . .	10.5†
Denmark . .	38.4
Sweden . .	34.6
Scotland . .	6.1‡
Norway . .	27.0§
Ireland . .	5.7§

* Bevolkerungstatistik by Dr. George Von Mayr, Zweite Lieferung p. 442.

§ Since 1896-1900

† Since 1891-1895

For more recent years we have the following table showing the rate of infant mortality per 100 children born living*:—

Germany . .	1913	15.1	Belgium ..	1912	12.0
	1921	13.3			
Austria** . .	1913	19.0	Netherlands . .	1914	9.5
	1919	15.6		1921	7.6
Finland . .	1913	11.3	Denmark . .	1913	9.4
	1918	11.5		1919	9.2
Roumania .	1914	18.7	Sweden . .	1914	7.3
				1917	6.5
Bulgaria . .	1911	15.6	Norway . .	1913	6.4
				1918	6.3
Italy . .	1914	13.0	England & Wales	1913	10.8
	1917	15.8		1919	8.9
Spain . .	1914	15.2	Scotland . .	1913	11.0
	1919	15.6		1919	10.2
Switzerland . .	1913	9.6	Ireland . .	1913	9.7
	1919	8.2		1919	8.8
France . .	1913	10.9†	Massachusettes	1913	10.9
	1919	11.9†		1917	9.9
			Japan . .	1917	17.0
Luxemburg .	1912	13.2		1918	18.9

** Austria as newly constituted.
† For 77 Departments.

These figures may be compared with infant mortality in India:—

Per 100 births

	Male	Female
1911	21.4	19.6
1912	21.6	19.9
1913	19.3	19.7
1914	21.9	20.4
1915	20.8	19.5
1916	20.9	19.5
1917	21.2	19.8
1918	27.4	26.0
1919	22.8	22.0
1920	20.1	18.8

The average of the decade, excluding 1918, was 21.1 males and 19.9 females.

*Conrad, Statistik, Erster Teil, p. 193.

Probable increase in India.

Not only is the rate of infant mortality in India the highest among the countries of the world, but it shows no signs of decreasing.

The following table shows the highest and lowest ratios of deaths of infants (children under one year) of both sexes in each 1000 of the population for the decades 1891-1900 and 1901-1910, and ratios calculated according to the number of births during the year for the decade 1911-1920 :—

	Male		*Female*	
	Highest	Lowest	Highest	Lowest
Madras				
1891-1900 . .	185.3	134.6	158.7	111.1
1901-1910 . .	231.4	153	192.6	127.3
1911-1920 . .	236.88	168.13	223.15	154.12
Bombay				
1891-1900 . .	243.08	157.22	222.6	135.5
1901-1910 . .	263.49	231.31	319.39	209.04
1911-1920 . .	293.15	172.16	280.18	159.01
Bengal				
1891-1900 . .	272.64	147.36	221.01	119.36
1901-1910 . .	303.92	261.72	264.68	220.52
1911-1920 . .	235.37	192.65	224.86	175.99
United Provinces				
1891-1900 . .	236.13	214.19	210.1	197.55
1901-1910 . .	425.59	268.97	418.79	252.59
1911-1920 . .	308.31	213.73	298.16	198.74
Punjab				
1891-1900 . .	273.15	160.29	275.82	152.02
1901-1910 . .	393.79	246.82	408.64	245.92
1911-1920 . .	261.2	186.32	264.4	178.65
Central Provinces				
1891-1900 . .	580.19	240.11	506.12	205.45
1901-1904* . .	605.72	318.22	525.93	278.3
1911-1920 . .	418.85	240.18	378.79	212.87

*Information not available for 1905-1910.

It will be seen that the highest as well as the lowest ratios for infants of both sexes were higher in all the provinces in the decade 1901-1910 than for the preceding decade. It is impossible to say how far the increase was due to improvements in the methods of recording deaths.

For the whole of India it is estimated that the infant death rate amounts to about one-fifth of the total death rate for all ages, and about one-fifth of the children die before the age of one year.

Infant mortality is particularly heavy in big cities, the ratio of deaths to births varying between 233 per 1,000 for Delhi and 556 for Bombay.

Age Distribution.

Age pyramids of various countries.

The high rate of infant mortality has an important influence on the division of the population according to age. Age distribution takes a pyramidal form. It is interesting to study the age pyramids of various countries. The age pyramid in the case of India has, on account of the high birth rate, a broader base than that of any other country; it has also the narrowest point among the age pyramids of all the countries of the world. The following table shows the age distribution per 1,000 of the population in the leading countries of the world*:—

Age.	Germany 1910.	Austria 1910.	Hungary 1910.	Italy 1911.	France 1911.
Under 10 . .	234	240	246	233	171
10—20 . .	203	205	209	200	166
20—30 . .	164	157	155	155	158
30—40 . .	139	129	120	119	148
40—50 . .	105	105	103	103	127
50—60 . .	76	81	85	88	104
60—70 . .	51	53	53	65	77
70 and more	28	30	29	37	49

* H. d. S. Altersgliederung der Bevölkerung p. 260.

Age	England & Wales 1911	European Russia 1897	United States of America 1910	Japan 1913	British India.	
					1911	1921
Under 10	209	273	222	244	276	274
10—20 . .	190	214	198	198	192	198
20—30 . .	173	158	187	154	178	170
30—40 . .	152	124	146	138	142	143
40—50 . .	115	94	106	101	99	94
50—60 . .	80	67	72	77	61	61
60—70 . .	51	44	43	57	36	36
70 and more	30	26	26*	31	16	17

*Includes 2 of unknown age.

Large proportion of children in India.

There are great differences in the age pyramids of various countries. The French pyramid is the most regular. France has the smallest number of children under 10, and the largest number of persons over 50 and persons of 70 years or more. The difference in numbers between Group 1 and Group 2 is very small—five. India has the largest number of children under 10, and the smallest number of persons above the age of 50—last three Groups. Further, we notice the great gap in the case of India between Group 1 and Group 2, 84 in 1911, 76 in 1921. The difference between the numbers in Group 1 and 2 is a measure of the rate of mortality among children, particularly infant mortality. This difference in the case of the countries mentioned in the table was as follows:—

Germany . .	. . 1910	31
Austria . .	. . 1910	35
Hungary . .	. . 1910	37
Italy . .	. . 1911	33
France . .	. . 1911	5
England and Wales	. . 1911	19
European Russia . .	. . 1897	59
United States of America	. . 1910	24
Japan . .	. . 1913	46
India . .	. . 1911	84
,, . .	. . 1921	76

Factors which influence the age distribution of the population.

The age distribution of the population does not remain fixed. It changes according to changes in the ratio of births to deaths. It is also influenced by migration. The influence of migration in this connexion is shown by the fact that the population per 1000 persons of the age 20—40 rose in Canada from 300 in 1891 to 331 in 1911. The proportion of adults in the population of Assam and Bengal, which receive immigrants, is higher than in Madras and the United Provinces, which send out emigrants to these and other parts of India. It is obvious that the fall in the birth and death rates must influence age distribution. The

The case of Sweden.

best illustrative case is that of Sweden, where statistics of population for a century and a half—1750 to 1900—are available. The birth rate fell from 35.7 per 1000 in 1751-60 to 27.1 in 1891-1900. The decrease in the death rate in the two decades was from 26.1 to 16.4. Particularly heavy was the fall in the ratio of deaths of infants to children born living—from 20.5 to 10.1. The result is seen in the narrower base of the age pyramid for 1900 as compared with that for 1750, while the proportion of those above 50 (last two Groups) increases :—

Age	1750	1800	1850	1900
Up to 5	132	119	124	115
5-15	200	204	205	210
15-30	258	246	275	246
30-50	234	257	236	224
50-65	114	118	112	121
65 and more . .	62	56	48	84

Difficulty of ascertaining the exact age of the people in India

We have statistics of age distribution for India for the five censuses which have been held since 1881. It is difficult to say how far these statistics are reliable. In view of the tendency to over-state and under-state ages in

certain cases the task of ascertaining the exact age of the people, even in the most advanced country, is by no means an easy one. In India, owing to the ignorance of the people and their prejudices, the natural difficulties of the work are enormously increased. It may be said that a census can yield correct results when the people, generally, are able to read and write, and understand the value and importance of the statistics which it is the object of the census authorities to collect. It has been suggested that for the ascertainment of age the indirect method of getting the date of birth and calculating the age from it is preferable to a direct question about age. In India, however, the census authorities have mostly to rely on guesses by themselves as to the age of the person or persons concerned, as the number of those who know their ages exactly is very small, while that of persons who know their date of birth is smaller still.

Ten-year age-groups for India, 1881-1921.

Our returns of age must be imperfect. It may, however be assumed that the percentage of error from census to census remains constant. A comparison of age returns for 1921 with those for preceding censuses would not therefore be valueless.

The following table shows ten-year age groups for India per 1,000 of the population for the five censuses.

Age-Groups.	1881	1891	1901	1911	1921
0-10	278	288	268	276	274
10-20	191	187	202	192	198
20-30	176	174	173	178	170
30-40	144	143	143	142	143
40-50	97	98	101	99	94
50-60	61	59	62	61	61
60-70	53	52	51	36	36
Over 70				16	17

The table shows considerable fluctuations in Group 1 and smaller fluctuations in other Groups. It is seen that the proportion of persons of a certain age does not remain constant over a long period of time. This is brought out more clearly by the following table which compares the proportions of children below 5 years, and of adults between 25 and 45 per 10,00 of the population at the five censuses :—

Fluctuations in age-groups and their causes.

Age Groups	1881	1891	1901	1911	1921
0-5	1,369	1,468	1,297	1,380	1,259
25-45	2,994	2,950	2,970	2,956	2,926

The increase or decrease at each census as compared with the preceding census is shown below:—

Age Groups	1891	1901	1911	1921
0-5	+99	−171	+83	−121
25-45	−44	+20	−14	−30

What are the causes of these fluctuations?

The age distribution is influenced not only by variations in the normal birth and death rates, but by special calamities such as war, famine or epidemics. The effect of famine, again, on age distribution is different from that of an epidemic like the influenza epidemic of 1918.

Effect of famine

A famine affects the very young and the very old more severely than persons in the prime of life. For example, the ratio of deaths in 1900

(per 1,000 living at the same age in 1891) for infants in the Central Provinces which suffered severely from the famine of 1899-1900, was 580 and for persons of 60 and over, 132, as compared with 30 for persons between 20-30, and 38.6 for persons between 30-40. Consequently at the close of a famine the number of children will be much reduced, while the proportion of adults to the total population will be higher than usual. The population will tend to increase rapidly and, in the absence of any fresh calamity, at the next census the proportion of children to the population will rise. The births will also exceed deaths in a population containing a comparatively high proportion of men and women of reproductive ages. The effect of the reduction in the number of children immediately after the famine will become perceptible 10-15 years after the famine in the unusually small proportion of adults to the population.

The case of Mysore.

The effect of famine on age distribution for a series of decades is well illustrated by the following table showing the number per 10,000 males of different ages in Mysore at the censuses of 1881, 1891, 1901, and 1911:—

	Number per 10,000 males aged			
	0—5	0—15	20—25	30—35
1881	(*b*) 915	1396	848	902
1891	(*a*)1384	(*b*) 921	850	829
1901	1282	(*a*)1326	(*b*)664	762
1911	1157	1256	(*a*)865	(*b*)710

The famine of 1876-77, which severely affected Mysore, reduced the number of children under 5 years in 1881. The result was a shrinkage in the age-groups comprising their survivors in the next three censuses, *viz.* 10-15 in

1891, 20-25 in 1901, and 30-35 in 1911 (*b*). The increase in births which follows a famine is shown by the high proportion of children in 1891, and an increase in the figures marked (*a*) in the age-group 10-15 in 1901, and 20-25 in 1911.

Summary of changes in 1881-1921.

The proportion of children below 5 increased from 1,369 in 1881 to 1,468 in 1891. The decade 1881-1891, as we have seen before, was not marked by any famine or other calamity, and the increase in births after the famine of 1876-77 was therefore to be expected. In 1901 the proportion of children fell—the difference amounting to 171 as compared with 1891. This was again due to the famines of 1896-97 and 1899-1900. There was a rebound after 1901, and in 1911 the proportion of children increased by 83. The fall in 1921 was due to the influenza epidemic.

As regards adults we notice the high proportion in 1881 immediately after the famine of 1876-77—the highest ever recorded at any census in India. It fell in 1891, but rose in 1901, again on account of the severe famines of the decade 1891-1900. It fell in 1911, and still more in 1921—the fall in 1921 as compared with 1901 being 44 per 10,000. The influenza epidemic of 1918 claimed a large number of victims from the ranks of adults. Mortality was high among persons between 20 and 40, particularly among adult females.

The difference between epidemics as plague or influenza and famines as regards their effect on age distribution is that while epidemics severely affect men and women in the prime of life, in a famine mortality among adults is comparatively small. In the Punjab, in 1907, there was a great excess of mortality on account of plague among persons from 10-50, especially among those aged 15 to 40.

The Duration of Life

Duration of life in India and other countries.

The mean after-life time at certain ages is longer in European countries than in India, and further, while in European countries the duration of life has increased, in India, according to available statistics, it has decreased.

The following table shows the mean after-life time at certain ages in different countries* and India:—

Countries.	Years.	At birth.	10	20	30	60	80
			Males				
India . .	1911	22.59	33.36	27.46	22.45	10.00	3.06
Germany . .	1910-11	47.41	52.08	43.43	35.29	13.18	4.25
Austria . .	1906-10	40.69	49.08	40.90	33.49	12.86	4.41
Sweden . .	1901-10	54.53	54.03	45.88	38.57	16.06	5.22
Norway . .	1901-10	54.82	52.92	45.16	38.85	16.80	5.85
Denmark . .	1906-10	54.90	55.10	46.30	38.00	15.20	5.10
Finland . .	1901-10	45.00	50.60	42.80	35.60	14.10	4.90
England & Wales . .	1910-12	51.50	53.08	44.21	35.81	13.78	4.90
Scotland . .	1911	50.10	51.86	43.27	35.17	13.54	4.94
Belgium . .	1891-00	45.35	50.25	41.80	34.20	13.40	4.50
Switzerland . .	1901-10	49.25	50.34	41.70	33.80	12.73	4.27
France . .	1898-03	45.74	49.75	41.53	34.35	13.81	4.87
Italy . .	1910-12	46.97	52.55	44.20	36.73	14.14	4.25
			Females				
India . .	1911	23.31	33.74	27.96	22.99	10.11	3.06
Germany . .	1910-11	50.68	53.99	45.35	37.30	14.17	4.52
Austria . .	1906-10	42.88	49.71	41.93	34.80	13.32	4.47
Sweden . .	1901-10	56.98	55.58	47.66	40.20	17.19	5.64
Norway . .	1901-10	57.70	55.08	47.34	40.24	17.85	6.28
Denmark . .	1906-10	57.90	56.70	48.20	40.10	16.50	5.50
Finland . .	1901-10	47.60	52.30	45.10	37.90	15.40	5.10
Englad & Wales . .	1910-12	55.35	55.91	47.10	38.54	15.48	5.49
Scotland . .	1911	53.18	53.83	45.35	37.22	15.17	5.51
Belgium . .	1891-00	48.85	52.75	44.45	36.95	14.75	4.85
Switzerland . .	1901-10	52.15	51.98	43.69	36.10	13.67	4.51
France . .	1898-03	49.13	52.03	44.02	36.93	15.08	5.38
Italy . .	1910-12	47.79	52.76	44.67	37.33	14.38	4.29

*Conrad, Statistik Erster Teil, p 217.

There are considerable differences in the mean after-life time in the earlier years. This is due to considerable variations in the rate of infant mortality in various countries. The differences begin to grow less after the age of 10. The case of India, however, seems to be peculiar. Here at all ages the mean after-life time is much less than in Europe. At the age of ten the European boy may expect to live a little more than 50 years; the Indian boy a little more than 33 years, and so on for other ages.

Increase in European countries

The actual increase in the mean after-life time at certain ages in the leading European countries is shown by the following table*:—

Actual increase in after-life time at certain ages. Minus (—) shows decrease:—

	Age 0		Age 10		Age 20	
	Male	Female	Male	Female	Male	Female
Germany (39 Years)	11.83	12.23	5.57	5.81	4.98	5.16
England and Wales (53 Years) . .	4.22	5.92	2.58	4.30	1.54	3.15
Sweden (85 Years)	15.05	13.44	8.84	6.99	8.56	6.16
France (81 Years)	7.44	8.33	2.75	2.13	1.53	.22
Italy (23 Years) . .	7.75	7.75	3.40	3.75	2.75	3.15

	Age 30		Age 60		Age 80	
	Male	Female	Male	Female	Male	Female
Germany (39 Years)	3.88	4.23	1.07	1.46	.15	.30
England and Wales (53 Years) . .	.31	1.58	—.60	—.24	—.31	—.21
Sweden (85 Years)	8.32	6.80	3.99	3.96	1.20	1.18
France (81 Years)	.35	3.53	.56	1.88	.12	.63
Italy (23 Years) . .	2.15	2.60	.50	.80	—.25	—.35

Decrease in India

The mean after-life time at certain ages for India is shown by the table given at the end of this section. The increase or decrease in 1911

*Based on table, given by Conrad, Statistik, Erster Teil p. 218.

as compared with 1881 and 1891 in the expectation of life is given below:—

At the age of	Increase (+) Decrease (—) in 1911			
	As compared with 1881.		As compared with 1891	
	Male	Female	Male	Female
0	—1.08	—2.27	—2.00	—2.23
10	— .64	+ .32	—2.10	— .66
20	—1.09	— .48	—1.78	—1.32
30	—1.35	—1.49	—1.21	—1.70
40	— .89	—1.54	— .74	—1.71
50	+ .4	— .68	— .31	—1.31
60	+ .75	+ .32	— .12	— .76
70	+ .75	+ .59	—2.9	— .58
80	+ .19	+ .18	— .59	— .70
90	+ .15	+ .19	— .54	— .65
100	. .	. .	— .50	— .83

It will be seen that the after-life time in 1911 for all ages was less than in 1891. We must not forget that the period 1881-1891 was not affected by famine or epidemics, while on account of plague and famine in certain areas the period 1901-1911 was one of inferior vitality. What is most remarkable is that the after-life time for ages 20-40 decreased in 1911 as compared with 1881. The very severe and wide-spread famine of 1876-77 reduced the expectation of life for all ages in 1881, as is evident from a comparison of the figures for 1881 with those of 1891. This famine explains the increase in the after-life time in 1911 for ages above 50, for famine mortality is heavy among old men, and the after-life time for ages above 50 in 1911 would be expected to increase as compared with the corresponding figures for 1881 which were influenced by famine.

Public health in the decade 1911-1921

The actuarial report for 1921 was not available at the time of writing, but the period 1911-1921 was made abnormally unhealthy by the influenza epidemic. Apart from influenza there were serious outbreaks of plague in Bombay, the Punjab, tho Central Provinces and the United Provinces in the first two years of the decade. The total death rate in British India from cholera amounted to 1.5 per cent. Malaria is endemic in some provinces; it tends to lower the vitality of the population and reacts on the birth rate. The population of Western Bengal is described as "sodden with malaria". Pthisis is responsible for considerable mortality in towns, specially of Western India—the deaths from this disease in Ahmedabad amounted in 1918 to 5 per mille of the population. In view of the state of public health in the last decade, the after-life time in 1921 as compared with 1891, would show a further reduction.

In this respect again conditions in India are in marked contrast to those of Europe. The increase in the duration of life in the leading countries of Europe is a sign of progress and prosperity, of improvement in public health, and of a steady rise in the level of economic well-being. The decrease in the duration of life in India, which is proved by the availabe figures, indicates lower vitality and a lower level of economic well-being.

[TABLE

Mean after-life time at certain ages in India

Age	Males			Females		
	1881	1891	1911	1881	1891	1911
0	23.67	24.59	22.59	25.58	25.54	23.31
1	31.98	32.73	30.72	32.81	32.54	31.49
2	34.27	34.94	32.76	34.52	34.38	33.42
3	35.37	36.15	34.03	35.33	35.37	34·58
4	35.89	36.80	34.73	35.64	35.86	35.19
5	36.01	37.08	35.01	35.63	36.06	35.40
10	34.00	35.46	33.36	33.42	34.40	33.74
15	30.99	32.34	30.32	30.56	31.72	33.78
20	28.55	29.24	27.46	28.44	29.28	27.96
25	26.19	26.35	24.86	26.50	26.96	25.40
30	23.80	23.66	22.45	24.48	24.69	22.99
35	21.38	21.13	20.16	22.33	22.44	20.69
40	18.90	18.75	18.01	20.03	20.20	18.49
45	16.41	16.47	15.97	17.56	17.92	16.38
50	13.93	14.28	13.97	14.96	15.59	14.28
55	11.52	12.16	11.99	12.32	13.20	12.20
60	9.25	10.12	10.00	9.79	10.87	10.11
65	7.20	8.22	8.06	7.54	8.71	8.10
70	5.44	6.48	6.19	5.63	6.80	6.22
75	3.99	4.95	4.50	4.08	5.14	4.52
80	2.87	3.65	3.06	2.88	3 76	3.06
85	1.94	2.59	1.93	1.94	2.64	1.93
90	1.00	1.69	1.15	. 91	1.75	1.10
95	.....	.50	.....	.....	.83	.....
100	.....	.....	.....	.....	.....	.....

The causes of death

Statistics of little value for comparative purposes

Our statistics showing the number of deaths according to cause, are of very little value for comparative purposes. There are only six heads of disease, "fevers" being the most important head. About 20 per thousand of the population die of "fevers". Inaccuracy of diagnosis is responsible for the large number of deaths entered under "fevers". It is estimated that one-fifth to one-fourth of the reported cases are genuine malaria cases, the remainder being cases of dysentry, pneumonia, pthisis and other diseases.

The basis of these statistics is report of death and declaration of its cause by the persons concerned, not doctor's

certificate. In Prussia, in almost all big towns, there is a system of inspection of the corpse *(Leichenschau)* by a medical authority. No such thing is possible in India, and as the proportion of the population who, when they fall ill, are treated by qualified medical practitioners, is very small the introduction of a doctor's certificate, stating the cause of death, would be of little use.

Death according to cause.

The following table shows the ratio of deaths in each thousand of population according to cause in British India. But for reasons given above we get no indication from the table of the progress of certain diseases in India, as pthisis, or of the success in fighting them.

Ratio of deaths in each thousand of population according to cause in British India:

Quinquennial Averages

	1901-05	1906-10	1911-15	1916-20
Cholera	1.28	2.09	1.46	1.53
Small-pox	.38	.47	.34	.37
Plague	2.92	1.89	1.54	1.05
Fevers	19.13	21.11	16.94	25.30
Dysentry and Diarrhœa . .	1.40	1.49	1.39	1.36
Respiratory diseases . .	.80	1.00	1.29	1.80
Injuries	.43	.43	.42	.41
Other causes	7.15	7.30	7.22	6.98
All causes	33.04	34.86	30.07	38.19

The ratio of deaths from cholera and small-pox in 1916-20 was practically the same as in 1901-05. The increase under 'fevers' in 1916-20 was due to the influenza epidemic of 1918-19. The ratio of deaths by respiratory diseases was higher in every quinquennium than in the preceding quinquennium.

No marked improvement in public health.

The figures, such as they are, do not show any marked improvement in public health during the last twenty years. The earliest available figures are for the year 1884. Deaths per thousand from all causes in that year were 24.48, from cholera 1.27, small-pox 1.22, fevers 14.52, and bowel complaints 1.73. These were the only categories of disease used. On account of addition of other heads of disease and improvement in registration the value of the figures for earlier years for comparative purposes is small.

Death from disease in European countries.

Fuller information, and for a longer period, about the causes of death is available for certain European countries. Great success has been attained in Europe in combating disease. Sixty years ago the state of public health in European countries was not much better than in India at the present time. In the Crimean war of 1854-56 while 58.8 per 1000 of the English army died on the field of battle or as the result of wounds received in battle, 191.7 died on account of disease. In the Franco-German War of 1870-71, 18.3 per 1000 of the German army died from disease against 34.7 who were killed or died or wounds. Deaths from disease were still more than half the number of deaths on the field of battle or from wounds inflicted in battle. In the World War of 1914-19, which lasted 53 months, the strength of the German army (including garrison troops) was 13,250,000. The total German losses were 128.6 per 1000, of which disease accounted for only 13.8 per 1000.

Germany

In Germany there has been a heavy decrease in the number of deaths from small-pox, scarlet fever, diptheria, typhoid, consumption of the lungs, and respiratory diseases. For the city of Halle in Germany statistics of deaths from certain causes are available for a very long period, and it is interesting to learn that

while in 1791 the number of deaths from small-pox per 10,000 living was 121.6, it was only 6.5 in 1872 (0.003 for the whole of Germany in 1907-11). Again in Halle 0.9 per 10,000 living died of typhoid and nervous fever in 1894-96 as compared with 154 in 1831-40.

England

The improvement in the public health of England is evident from the following table showing deaths for all ages from various causes per 10,000 living:—

Quinquennial Averages.

	1838-42	1901-1910	1911-1920
Small-pox	57.5	1.3	0.0
Measles	53.9	30.9	27.5
Scarlet fever	79.7	10.6	4.7
Diptheria		17.9	14.1
Diptheria and croup	.....	19.2	14.2
Hooping cough	50.4	27.8	18.3
Tuberculosis (all forms) . .	441.9	165.3	142.5
Tuberculosis of respiratory organs	378.2	116.1	107.4
Cancer	17.3	90.4	111.5

Mortality from cancer and from diseases of the circulatory system (not shown separately in the table) has increased in England. In part this may be attributed to better diagnosis. In all other cases there has been a fall.

It will appear that we have still much to learn from western countries in regard to the methods of fighting disease.

—:o:—

III

SEX, MARRIAGE AND HOUSEHOLD

Proportion of females.

The following table shows the number of females per 1000 males for different age periods in various countries:—

	Years	Age 0-10	10-20	20-30	30-40	40-50	50-60	60-70	70 and more
Germany . .	1910	989	995	1,001	1,004	1,033	1,112	1,219	1,314
Austria . .	1910	989	1,023	1,043	1,049	1,087	1,071	1,118	1,199
Hungary . .	1910	990	1,012	1,059	1,051	1,015	993	1,017	1,061
Italy . .	1911	963	1,017	1,121	1,108	1,057	1,031	1,028	1,038
France . .	1911	989	994	1,021	1,008	1,026	1,059	1,155	1,300
England & Wales	1911	996	1,009	1,114	1,082	1,078	1,093	1,167	1,416
United States	1910	979	990	953	903	884	859	925	1,023
Japan . .	1913	976	968	967	969	949	972	1,042	1,210
India . .	1911	992	874	1,024	910	912	950	1,092†	—
„ . .	1921	998	869	1,022	905	902	926	1,040†	—

† 60 and more

Deficiency of females at birth.

It will be seen that in the youngest group 0-10 there is an excess of boys over girls in every country. The deficiency of females at birth is a well-known phenomenon. In European countries the proportion of boys to girls at birth is 104-106 boys to 100 girls. The average number of female births per 1000 male births in certain provinces of India is shown below:—

	1891-1900	1901-1911	1911-1920
Assam . .	929	934	937
Bengal . .	936	941	933
Bihar & Orissa . .	942	955	950
Bombay . .	926	926	925
Burma . .	931	938	945
C. P. & Berar . .	941	954	955
Madras . .	959	958	956
N.W.F. Province . .	816	819	805
Punjab . .	906	909	906
United Provinces . .	918	924	919

There is a deficiency of females at birth in all provinces, but the deficiency is greater in the Punjab and North-West Frontier Province than in any other province.

Increase in the proportion of females in the higher age groups in European countries.

In European countries, however, the death rate among females is much lower than among males, and consequently the proportion of females to males in the higher age-groups increases. The table given above shows that in Germany and Austria the proportion of females rises steadily without break, the proportion being higher in the case of the last group, 70 and more. In England and Wales, there is a slight fall as we pass from the group 30-40 to 40-50, but among European countries, with the sole exception of Hungary, there is an excess of females over males in all age-groups above 20. The United States show an excess of males over females except in the case of persons over 70. This is explained by the immigration of males.

Exess of males over females in India.

A comparison of figures for India with those for European countries shows that conditions here are not so favourable for females as in Europe. There is an excess of females over males in the age-group 20-30, and the last group 60 and more. In other age-groups there is an excess of males over females. In the total population also there is an excess of males over females, and in this respect conditions in India differ materially from those of European countries, as will be seen from the following table:—

Number of females per 1000 males in the total population.

India	1911	. .	954*
Germany	1910	. .	1026
Austria	1910	. .	1036
Hungary	1910	. .	1019

*Actual population. Natural population 953.

France	1911	. .	1036
Italy	1910	. .	1036
Great Britain & Ireland	1911	. .	1061
Australia	1911	. .	926
Canada	1911	. .	889
United States of America	1910	. .	944

Excepting Australia, Canada, and the United States of America, where there is a deficieney of females on account of the immigration of males, in every country mentioned in the table the number of females exceeds that of males. Further, the proportion of females to males has steadily declined in India during the last twenty years:—

Number of females per 1000 males in India.

	1901	1911	1921
Actual population	963	954	945
Natural population	963	953	944

The deficiency of females is greater in some provinces than in others, as will be seen from the following table:—

	1921.		1901.	
	Actual Population.	Natural Population.	Actual Population.	Natural Population.
Assam . .	936	951	949	973
Bengal . .	932	954	960	982
Behar and Orissa . .	1,029	999	1,047	1,027
Bombay . .	919	931	945	950
Burma . .	955	1,026	962	1,027
Central Provinces & Berar	1,002	1,006	1,019	1,026
Madras . .	1,028	1,004	1,029	1,029
North-West Frontier Province	831	865	846	885
Delhi . .	733	788	854	846
Punjab . .	828	819		
United Provinces . .	909	896	937	926

There is an excess of females in the natural population of Burma, Central Provinces and and Berar, and Madras, in all other provinces there is a deficiency of females, the deficiency being greatest in the case of the Punjab and the North-West Frontier Province. It is also seen that in the case of all provinces without exception there has been a fall in the proportion of females during 1901-1921.

Its causes

What are the causes of this remarkable deficiency of females? The Census Commissioner for 1911 conclusively showed that the deficiency could not be ascribed to defective registration of females. The deficiency of females at birth is not a satisfactory explanation, for as we have seen, such deficiency is a universal phenomenon. A higher death rate among boys, who are constitutionally more delicate than girls, equalizes the proportions of the two sexes by the time adolescence is reached. After that, in European countries, mortality among males remains relatively high on account of their harder life, which is more exposed to risk, than that of females. In India, among the lower classes, women generally lead a harder life than men, and among all classes the evil of early marriage and excessive mortality amongst young mothers tends to reduce the number of women and their proportion to men. The *purdah* among the Musalmans and the Hindus of higher castes in some provinces must adversely affect the health of women, particularly of those residing in towns. That female mortality is increasing is shown by the following figures:—

[TABLE

Number of female deaths per 1000 male deaths in certain provinces

	Averages		
	1891-1900	1901-1910	1911-1920
Assam . .	883	928	894
Bengal . .	874	895	909
Behar & Orissa . .	870	940	936
Bombay . .	901	936	957
Burma . .	817	849	901
C. P. & Berar . .	853	917	923
Madras . .	951	961	979
North-West Frontier Province . .	796	912	892
Punjab . .	918	983	928
United Provinces . .	881	957	918

In every province the proportion of female deaths in the decade 1901-1910 exceeded that in 1891-1900, and only in four provinces was this proportion less in the last decade than in 1901-1910.

Marriage

Chief features of the Indian system

There are three chief features in the Indian conditions relating to marriage as compared with those in European countries, viz, (a) the universality of marriage (b) the early age of marriage, and (c) the large proportion of widows.

[TABLE

The main statistics relating to marriage in India are given below :—

Per 1000 of each sex.

	Unmarried		Married		Widowed	
	1921	1911	1921	1911	1921	1911
Males . .	498	490	438	456	64	54
0—5 . .	994	993	6	7	.....	.....
5—10 . .	966	962	32	37	2	1
10—15 . .	879	866	116	129	5	5
15—20 . .	687	665	298	322	15	13
20—30 . .	292	276	663	687	45	37
30—40 . .	83	79	835	857	82	64
40—60 . .	44	44	797	819	159	137
60 and over . .	37	38	641	660	322	302
Females . .	358	344	467	483	175	173
0—5 . .	988	985	11	14	1	1
5—10 . .	907	891	88	105	5	4
10—15 . .	601	555	382	430	17	15
15—20 . .	188	163	771	800	41	35
20—30 . .	38	34	870	884	92	82
30—40 . .	17	16	769	784	214	200
40—60 . .	13	12	493	487	494	501
60 and over . .	12	12	174	158	814	830

The number per 1000 of the unmarried in India, 498 males, and 358 females, is the lowest among all countries; Japan has the highest number of the unmarried, 657 males and 650 females, and, excepting India, France the lowest, 515 males and 454 females. In Germany, according to the census of 1910, per 10,000 of each sex, 6091 males and 5653 females were unmarried.

Age of marriage in India and Europe

As regards the age of marriage, by twenty 298 per 1000 of males, and 771 of females are married in India. The highest proportion of the married for males is shown by the age-group 30-40, and for females by 20-30. But a high proportion of males are married by 30, and practically every female is married by 20. The age of marriage is higher for boys than girls.

The average age of first marriage in the case of males and females in various countries is shown below :—

	Year	Men	Women
Germany . .	1913	27.5	24.7
France . .	1906/10	28.0	23.7
Italy . .	1911/14	27.2	23.6
Switzerland . .	1901/10	28.3	25.8
England and Wales . .	1906/14	27.4	25.7
Scotland . .	1906/14	27.8	25.8
Netherlands . .	1906/15	27.6	25.8
Sweden . .	1906/13	28.8	26.4

Further information regarding the age of marriage in European countries is given by the following table :—

Age distribution of persons who got married.

	Year	Under 20	20-24	25-29	30-39	40-49	50-59	60 and more
	Males. Per cent of total number of men who got married							
Germany . .	1914	0.2	30.4	41.4	20.5	4.8	1.9	0.8
Italy . .	1914	34.8		37 2	18.6	5.2	5.2	1.7
France . .	1911	0.7	24.5	44 0	22.1	5.4	2.3	1.0
England and Wales	1914	1.5	34.9	34.3	19.8	5.4	2.3	1.2
Sweden . .	1913	0.2	23.5	39.3	27.3	6.4	2.4	0.9
Norway . .	1914	1.7	28.0	35 3	24.9	6.3	2.4	1.4
Denmark . .	1914	0.3	30.6	39.5	21.7	5.1	2.1	0.7
Switzerland . .	1915	0.6	22.8	36.7	27.2	8.1	3,2	1.4
	Females. Per cent of total number of women who got married							
Germany . .	1914	9.1	49.8	25.4	11.4	3.2	0.9	0.2
Italy . .	1914	67.6		18.5	8.9	2.7	1.3	0.7
France . .	1911	15.4	45.9	21.2	12.1	3.8	1.3	0.3
England and Wales	1914	7.6	44.1	27.3	14.6	4.0	1.3	0.4
Sweden . .	1913	7.2	40.5	29.9	17.6	3.7	0.9	0.2
Norway . .	1914	8.5	41.9	28.2	16.5	3.8	0.9	0.2
Denmark . .	1914	10.4	4.57	27.8	12.7	2.6	0.7	0.1
Switzerland . .	1915	5.5	41.1	28.8	17.5	5.2	1.6	0.3

*H. d. S. Heiratsstatistik, p. 246.

It will be seen that in most European countries the percentage of men who marry below the age of 20 is insignificant. The table again shows that the highest proportion of men who marry (first marriage) are between the ages 25-29, and women between 20-24.

The number of widows in India in 1921 was 175.0 per 1000 of the population, as compared with 73.2 in England, and Wales (1911) and 81.3 in Germany. The large number of widows in India is chiefly due to the prejudice against the re-marriage of widows.

Rise in the age of marriage in India.

We may note in passing that the age of marriage is rising in India, though progress is slow. The number of unmarried males aged 10-15 per 1000 increased from 843 in 1881 to 879 in 1921 and of unmarried males aged 15-20 from 617 to 687; the number of unmarried females aged 5-10 increased from 874 in 1881 to 907 in 1921, and of unmarried females aged 10-15 from 481 in 1881 to 601 in 1921. But in view of the fact that in 1921, 298 per 1000 of the married males were below the age of 20 and 382 of the females below the age of 15 would show that the evil is still serious.

Number of marriages dependent upon economic conditions in European countries.

A close connexion exists in European countries between the number of marriages and the existing political and economic conditions. For example, the proportion of marriages performed per 1000 of the mean population in Germany rose from 8.2 to 10.3 in 1872 with the beginning of the era of prosperity following on the successful termination of the war with France; with the return of adverse economic conditions the proportion gradually fell to 7.5 in 1881; thereafter it rose again with the improvement of the economic outlook. The depression in the beginning of the year 1890, and that following the crisis of 1907 caused this proportion to fall, while economic prosperity

in the latter half of the decade 1891-1900 raised it. During the war the proportion fell as low as 4.1 in 1915 and 1916 in Germany, while in Norway and Sweden, for which the war was on the whole a period of prosperity, the proportion rose from 6.3 in 1913 to 7.5 in 1918.

but not in India.

For India, unfortunately, no record of the number of marriages performed each year exists. We, however, know the number of the married at each census. As economic conditions vary considerably from decade to decade, we may try to ascertain if economic prosperity or adversity has any effect on the number of the married. The appended statement shows the number of married males and females at each census per 1000 of each sex:—

	Males		Females	
	Married	Widowed	Married	Widowed
1881 . .	467	49	490	187
1891 . .	465	48	485	176
1901 . .	454	54	476	180
1911 . .	456	54	483	173
1921 . .	438	64	467	175

The view of the Census Commissioner, 1921.

We notice a decrease in the number of the married from 1881 to 1901, a slight rise in 1911 and a fall in 1921. The Census Commissioner for 1921 thus comments on the increase in 1911:

"The year 1911 ended in a period of comparative prosperity. There had been no wide-spread scarcity and though plague was violent in places, the mortality from it was distributed over a considerable period of time and was local in character. Economic conditions were on the whole favourable and mortality normal. The result was shown in a substantial rise in the number of the married and a decline in the number of the widowed".*

*Vol. I. Report, p. 157.

The "substantial rise in the number of the marrried" consisted in an increase of 2 per 1000 in the proportion of males and of 7 in that of females. If we combine the numbers of married and widowed then economic prosperity of the decade 1901-1910 had the effect of reducing the proportion of the unmarried males per 1000 from 492 in 1901 to 490 in 1911; the number of uumarried females remained unchanged. It would seem that the change in 1911 was so slight as to be negligible.

It may also be doubted whether the decrease in the number of the widowed in 1911 was due to economic prosperity in the decade ending in that year. The decrease in the number of widows was greatest in the case of Animists. "The explanation is", wrote the Census Commsssioner (1911), "that at the time of that census (1901) conditions were abnormal owing to the famines of 1897 and 1900 which hit the primitive Animistic tribes harder than any other section of the community, and caused an unusally high mortality amongst them". The Census Commissioner attributed the steady decline in the proportion of Muhammadan widows to the weakening of the prejudice against widow re-marriage. The proportion of Hindu widows in 1911 was less than that in 1901 by 6 per 1000, but greater than that in 1891 by 2 per 1000. The Census Commissioner for 1911 made no claim that the decrease in the number of widows was due to economic prosperity.

Variations in the number of the married are chiefly determined by causes which influence the age constitution of the people.

The statistics for India as a whole do not show any appreciable fluctuation in the number of the married according to favourable or unfavourable economic conditions. It would seem that in India the variations in the number of the married are chiefly due to causes which influence the age constitution of the people. For example, the proportion of the married of

each sex was highest in 1881, and lowest in 1921. In spite of the economic prosperity of the decade 1881-1891, which was free from any special calamity such as famine or plague, the proportions of married and widowed for each sex were lower in 1891 than in 1881. The probable explanation is that on account of the famine of 1876-77 the proportion of the adults of both sexes to the total population was higher in 1881 than in 1891. The reduction in the proportion of the married in 1921 was chiefly due to the heavy mortality amongst adults owing to influenza in 1918.

Marriage is universal in India, as it is regarded a religious duty. Economic considerations are not taken into account by people intending to marry, or by parents when marrying their children. The proportion of the married to the total population would remain practically unchanged from decade to decade but for calamities which cause a change in this proportion by altering the age constitution of the people.

Houses and Families

Definition of a house.

Two definitions of a house are used in India for census purposes. "Where a structural criterion is taken", says the Census Commissioner for 1921, "a house is ordinarily defined, with miner local qualifications, as the residence of one or more families having a separate independent entrance from the common way. Where the social aspect is looked to, it is defined as the home of a commensal family with its resident dependants and servants." The social definition of a house is regarded as more important than the structural view, but Madras and Central Provinces still retain the structural definition.

The definition used in Germany.

In Germany a house for census purposes is defined as "persons associated together for dwelling and household purposes who inhabit a

separate dwelling and manage their own household."* This definition includes single persons who dwell in separate houses, and manage their own household. This is also the definition of a house commonly used in European countries. The majority of households in European countries are, of course, family households, but the number of single households is also considerable. In Germany there were in 1910, 1,045,143 single households out of a total number of 14,346,692 households. 7.3 per cent of the total number of households were single households, 92.3 per cent. family households, and 0.4 per cent. institutions for various purposes, such as poor-houses, hospitals, hotels, educational institutions etc. In 1871 the percentage of single households in Germany was 6.1 and of family households 93.5.

Total number of households and the average number of persons per house in India and other countries.

There is no classification of households in India, but we may compare the total number of households and the average number of persons per house in India with those in other countries:—

*Die deutsche Reichsstatistik versteht unter Haushaltung "die zu einer wohn-und hauswirtschaftlichen Gemeinschaft vereinigten Personen, die eine besondere Wohnung innehaben und eine eigene Haushaltung führen." H. d. S Haushaltung, p. 166

	Year	Number of house holds.	Average number of persons per household
India	1921	65,198,389	4.9
Germany*	1910	14,346,692	4.53
Austria	1900	5,553,006	4.71
Russia	1897	22,023,474	5.70
Servia	1905	436,987	6.15
Roumania	1899	1,444,314	4.12
Bulgaria	1905	708,814	5.69
Italy	1901	7,027,524	4.62
Portugal (without colonies) . .	1911	1,316,995	4.21
Switzerland	1900	728,920	4.56
France	1901	10,939,994	3.51
Belgium	1910	1,831,102	4.05
Netherlands	1909	1,308,775	4.48
Denmark	1911	651,098	4.23
Norway	1910	564,567	4.18
England and Wales . .	1911	7,943,137	4.54
Scotland	1901	964,940	4.63
United States . . .	1910	20,255,555	4.54
Japan	1908	9,250,434	5.36

It will be seen that the average number of persons per household is higher in India than in the leading countries of Europe. It is lowest in France. Of the countries mentioned in the table, Japan, Russia, Servia, and Bulgaria have a larger number of persons per house than India.

The French household.

The small size of the French household is due to (1) the larger number of single households in France, and (2) the small size of the French family. Of the 11 million households in France in 1901 about a million were single households. It is also well known that a French married couple has fewer children on an average than is the case in any other country. In 1906, 21.3 per cent of the families in France had only two children, 15 per cent. 3 children, 10. 3 per cent. four children, and 20.7 per cent. more than 4 children. A married pair with two children is becoming the typical family in France.

* U. d. S. Haushaltung, p. 168.

In European countries generally the percentage of households with three or four members is the highest. This is shown by the following table*:—

Households with different number of members as percentages of the total number of households.

Household with members	Germany	Switzerland	Servia	Bulgaria	France	Sweden	Denmark	England & wales	Russia
1	7.3	9.5	4.0	4.5	15.8	23.6	10.0	5.3	4.9
2	15.2	15.4	17.4	6.8	22.6	15.7	17.9	16.2	9.4
3	17.7	16.4		10.6	20.2	14.4	18.5	19.3	12.4
4	17.4	15.7	27.0	13.9	16.1	12.8	16.1	18.1	15.2
5	14.4	13.3		16.0	10.8	10.5	12.7	14.4	15.7
6	10.7	10.2		15.2	6.5	8.2	9.3	10.4	
7	7.3	7.2		11.9	3.7	6.0	6.4	6.9	
8	4.5	4.7	42.7	8.0	2.0	4.0	4.1	4.4	38.5
9	2.6	3.0		4.9	1.7	2.4	2.3	2.5	
10	1.4	1.9		3.0		1.3	1.3	1.3	
Over 10	1.5	2.7	8.9	5.2	0.6	1.1	1.4	1.2	3.9

The size of the family in India.

A special investigation was made regarding the size of the family in certain provinces of India in connection with the census of 1921. It appears that the usual number of children born in a family in India is from 5 to 7, the number being higher in the south than in the north, and in the lower classes than the higher classes. Between 1-3 and 2-5 of the children born die. The most usual size of the family in the Punjab is from 3 to 5 children. The normal household in the Baroda State comprises on an average 4.1 persons—"the size of the complete family most favoured five children."† In the Bombay Presidency the commonest type of household (the mode) averages 4 persons though owing to a fair number of families of large size the mean is five persons.

The household is becoming smaller in India and other countries.

The improvement in the facilities of communication and transportation and the growth of modern economic conditions generally which encourage the mobility of labour, tend to

*H. d. S, Haushaltung, p. 170.

†The Census of India, 1921, Report. Appendix VII.

reduce the size of the household. Our census reports contain many references to the disruptive forces which are tending to break up the joint-family system. The following table shows that in European countries as well as India the household is becoming smaller. The only exceptions to the rule are Hungary and Scotland.

India		Germany		Austria		Switzerland		Italy	
1881	5.8	1871	4.70	1890	4.84	1850	4.90	1871	4.68
1891	5.4	1910	4.53	1900	4.71	1900	4.56	1901	4.62
1901	5.2								
1911	4.9	France		Belgium		Denmark		Norway	
1921	4.9								
		1856	4.11	1856	4.84	1860	4.85	1865	4.92
		1901	3.55	1910	4.05	1911	4.23	1910	4.18
		Hungary		England and Wales		Scotland		United States of America	
		1850	4.28	1851	4.83	1861	3.52	1850	5.55
		1900	4.76	1911	4.54	1901	4.62	1910	4.54

These figures must not be taken to be exact, but they are still valuable as indicating a general tendency.

—:o:—

IV

DENSITY, URBAN AND RURAL POPULATION AND LITERACY

The area, population and density at the five censuses held between 1881 and 1921 are shown below:

	Area	Population	Density per square mile
1881 . .	1,382,624	253,896,821	184
1891 . .	1,560,160	287,223,431	184
1901 . .	1,766,597	294,361,056	167
1911	1,802,657	315,156,396	175
1921	1,805,332	318,942,080	177

According to these figures density per square mile decreased from 184 in 1881 to 177 in 1921! The comparative value of these figures, however, is small for reasons explained in Chapter I. To find the real density of the population at each census we have to eliminate the growth of numbers due to improvement in the methods of the census and the addition of new areas. The real increase of population and density per square mile at each census are shown below:

	Population in millions	Density per square mile
1872 . .	265.1	147
1881 . .	268.1	149
1891 . .	292.4	162
1901 . .	296.5	164
1911 . .	315.2	175
1921 . .	318.9	177

The average density per square mile in India may be compared with that in other countries, though the comparison does not tell us much.

	Year of Census	Density per square mile
India	1921	177
Germany	1919	332
Austria	1920	197
Hungary (old territory)	1910	166
Tschecho-Slovakia	1910	251
Bulgaria (old territory)	1910	117
Roumania (new territory)	1910-15	142
Greece (old territory)	1907	109
Italy (old territory)	1911	313
Spain	1920	109
Portugal	1911	168
Switzerland	1910	236
France (without Alsace-Lorrain)	1921	184
Belgium	1919	666
Netherlands	1918	513
Denmark	1916	194
Sweden	1920	36
Norway	1910	18
England and Wales	1921	650
Greenland	1911	.4
European Russia (old territory without Poland and Finland)	1915	70
Poland (new territory)	1910-11	212
United States	1910	31
Egypt	1907	34

The density of population is greatest in Saxony, which has 805 persons per square mile. Next is Belgium with 666 persons, followed by England and Wales with 650 persons per square mile.

Average density per sq. mile tells us nothing about the distribution of the population.

The average density per square mile, however, gives us no indication of the actual distribution of the population. For example, while the average density per square mile for the whole of Russia is 60 persons, Siberia has only 1 and Caucasia 70. In Germany, East Prussia has a density of 150, Westphalia 575, the Rhein Provinces 716 and Saxony 805. In India there are great differences in regard to density between different parts of the country.

British India has an average density per square mile of 196, and Indian States, 113. Among the provinces, ignoring Delhi, whose density is high (823) owing to the inclusion of a large urban area, Bengal shows the greatest density, 678. Next to Bengal the most thickly populated province of India is the United Provinces (density 414); Behar and Orissa follow with a density of 340. Madras has 297 persons per square mile, Punjab 183 and Bombay 143. Baluchistan is the province with the lowest density, 6 persons per square mile.

Among the larger Indian States, Baroda shows the greatest density (262), and Kashmere the least (39). The Madras States have as many as 511 persons per square mile, while Baluchistan States have only 5.

There are great variations in density within these political divisions. A general view of the density of the population is given by the appended statement, which shows that 48.3 per cent. of the population occupies 16.4 per cent. of the total area at a density of over 354 per square mile, while less than one-third of the population occupies 69.3 per cent. of the total area at a density below the mean of the country (177):—

Density	Area in square miles	Percentage on total area	Population	Percentage on total population
India—177	1,805,332	100	318,942,480	100
Below 177. .	1,207,369	69.3	99,569,208	32.1
Over 354 . .	285,160	16.4	149,752,290	48.3
177—354 . .	312,803	14.3	69,620,982	19.6

Variations in density in the same province.

Some idea of the variations in density in the same province may be formed from the fact that in Assam density ranges from 7 persons per square mile in the Balipara Frontier Tract to over 900 in parts of the Surma Valley (mean density of Assam 130) and in East Bengal, which is more thickly populated than any other part of India, from 34 in the Chittagong Hill Tracts to 1,148 in Dacca. The population of Eastern Bengal rises in more than one-fifth of the area to over 1,050 per square mile. The Province of Behar and Orissa has a mean density of 340 per square mile, but within the Province density ranges between 109 in the Angul district of Chhota Nagpur and 907 in the Muzaffarpur district of North Behar.

Density according to Natural Divisions

Sir Edward Gait, the Census Commissioner for 1911, divided India into 16 Natural Divisions on the basis of rainfall. The statement below shows the Natural Divisions in their order of density:—

[TABLE

		Density per square mile	Mean annual rainfall in inches
I.	Bengal	534	76
II.	Behar and United Provinces East . .	526	47
III.	Madras South East	386	39
IV.	Malabar and Konkan	382	101
V.	United Provinces West, and Punjab East and North	274	34
VI.	Orissa and Madras Coast, North . .	225	50
VII.	The Deccan	169	30
VIII.	Gujrat	153	24
IX.	Central India East, Central Provinces and Berar, and Chhota Nagpur . .	136	47
X.	Rajputana East and Central India West	131	25
XI.	Assam	115	92
XII.	Lower Burma	80	146
XIII.	The North-West Dry Area	72	10
XIV.	Upper Burma	39	48
XV.	Kashmere	37	24
XVI.	Baluchistan	6	8

It would have been interesting to learn how the population of India and density had varied according to Natural Divisions since 1911, but unfortunately the figures for 1921 are not available as Mr. Martin, the Census Commissioner for 1921, thought it "unnecessary to present the statistics of India as a whole in any scheme of natural divisions".

What are the factors which determine the density of population?

Factors which determine the density of population in European countries,

"In former times," says Conrad, "the growth of numbers was chiefly determined by the productiveness of land. The growth of civilization, which implies mastery over nature in a higher degree, and the development of industry and trade, make it possible to become independent of agricultural conditions,

and cause a heavy density of population also in places poorly endowed by nature. The great increase of population among modern civilized peoples is due to the growth of trade and industry''.*

The growth of population in the leading countries of Europe in recent times has been, as we have already seen, far more rapid than in India. As regards density of population the following statement is instructive :—

Density per square mile

India		East Prussia		Saxony		Westphalia	
1872	148	1871	135	1871	440	1871	225
1921	177	1919	150	1919	805	1919	575
England & Wales		France		Sweden		Spain	
1871	389	1872	177	1872	23	1871	85
1921	650	1921	184	1920	36	1920	109

The increase in density in the industrial districts of Germany may be contrasted with the almost stationary conditions in East Prussia. In England and Wales the density per square mile has increased by 261 during the last half-a-century. In France the growth of numbers, for reasons which are well known, is very slow. The very considerable increase in the density of the population in certain parts of Germany and England and Wales is mainly due to the development of trade and industry in these countries.

and in India

In India agricultural conditions are of far greater importance in determining the distribution of the population than commercial or industrial development. Among agricultural conditions account has to be taken of rainfall, irrigation, configuration of the surface, and fertility of the soil. These are factors determining the productiveness of the soil, and density in India varies according to the productiveness of the soil.

Rainfall

Density does not vary exactly as rainfall. The parts of the country which receive the heaviest rainfall (Lower Burma, Assam) are not the

*Statistik, Erster Teil p. 81.

parts which are most densely populated. This is because excessive rainfall is not beneficial. The Census Commissioner for 1911 pointed out that a well-distributed annual rainfall of 40 inches "is sufficient in most parts of India", and that, "it is only where it is less than this, or is badly distributed, that differences in the amount received have any marked influence on the success of cultivation and consequently on the density of population."*

Irrigation

The influence of irrigation as a factor in determining the density of the population is shown by the fact that the district of Lyallpur in the Punjab, with an annual rainfall of 13 inches, has a density of 301 per square mile. In 1891, before irrigation started, Lyallpur had only 7 inhabitants to the square mile. The canals were opened in 1892 and by 1901 the district had a population of 187 to the square mile. The density rose to 272 in 1911 and it is now 301.

In those parts of the Punjab where crops mainly depend on the supply of water by artificial means, canal or well irrigation, rainfall has practically no effect in determining the incidence of the population on cultivation. This is well brought out by the following table:—

Districts with over 70 per cent. of matured crops irrigated	Incidence on cultivated area	Rainfall. Inches	Canal irrigation	Well irrigation
Amritsar	670	24	40	30
Muzaffargarh	568	6	53	24
Jhang	482	10	58	28
Lahore	472	18	56	22
Gujranwala	443	23	55	21
Multan	442	7	73	14
Montgomery	430	10	64	23
Lyallpur	417	13	97	1
Shahpur	365	15	64	11

* Report, India, p. 26.

It will be seen that the incidence does not vary as the rainfall. For example, the incidence is heavier in Muzaffargarh than in Jhang, though Jhang has more rainfall, and so on. The incidence is heavier in Amritsar than in Muzaffargarh, but not in any proportion to the rainfall in the two places.

Where, however, irrigation is of less importance, the incidence on cultivation varies according to the rainfall. This is shown by the following table:—

Districts with less than 28 per cent. irrigated	Incidence on cultivated area	Rainfall. Inches	Irrigation
Kangra	984	74	20
Simla	972	63	0
Hoshiarpur	831	35	11
Gurdaspur	652	34	28
Rawalpindi	538	32	2
Ambala	522	32	6
Jhelum	443	26	5
Gurgaon	407	25	17
Rohtak	398	20	27
Attock	340	20	9
Mianwali	361	12	12
Hissar	196	16	16

The exceptional case of Hissar is explained by the fact that it lies on the border of Rajputana and the land of the district is of poor, sandy quality.

Configuration of the surface.

Configuration of the surface is next in importance to rainfall in regard to its effect on the density of population. The most thickly peopled tracts in India are the level plains of Bengal, Behar and Orissa and the United Provinces East, and the low-lying plains along the sea-coast in south India. The configuration of the surface is also favourable in the United Provinces West and the Punjab East, but the rainfall is insufficient. Hence the great importance of irrigation in these tracts.

Fertility of the soil.

The fertility of the soil is of less consequence in India than the amount of the rainfall and configuration of the surface. The valleys of the Ganges and the Indus are both alluvial formations but density is heavy in the former and light in the latter. The explanation of such wide differences in density, when the nature of the soil and configuration are the same, lies in the difference in rainfall.

Urban and Rural Population.

Towns and Villages in 1881.

At the first general census of India in 1881, towns were defined as "collection of habitations where the inhabitants exceed 5,000, but are less than 50,000"—habitations where more than 50,000 persons lived were classed as "cities." All places centaining less than 5,000 persons were regarded as villages.

The number of towns and villages in 1881 is shown by the statement given below:—

		Number
More than 50,000 (cities)	. .	66
5,000 — 50,000	. .	1,836
5,000 — 10,000	. .	1,325
10,000 — 15,000	. .	291
15,000 — 20,000	. .	97
20,000 — 50,000	. .	123
Villages :—		
Not exceeding 1,000	. .	602,467
1,000 — 2,000	. .	30,040
2,000 — 5,000	. .	8,931

90.9 per cent. of the total population lived in villages and 9.1 per cent. in towns as defined above. "Thus there are 10 villagers to every 1 townsman, the proportion in England being 1: 2", wrote the Census Commissioner.

At the census of 1891 the definition of a town was extended so as to include many of the smaller municipalities and

other areas which would have been classified as villages if the numerical standard of 5,000 had been strictly adhered to. About 25 per cent. of the total number of towns fell below the standard of 5,000 in point of population. The urban population was found to be 9.48 per cent. of the total population. The number of towns of various sizes in 1891 and the percentage of urban population living in them are shown below :—

	50,000 and over	20,000	10,000	5000	Under 5,000
Percentage of urban population in towns of . .	35	16	20	23	6
Number of towns . .	78	149	407	896	505
Total number of towns . .	2,035	—	—	—	—

While comparing conditions in India with those in England the Census Commissioner pointed out that whereas in England 53 per cent. of the whole population lived in 182 towns of 20,000 and upwards, in India, though there were 227 such towns, only 4·84 per cent. of the population resided in them.

The town population in 1891 as compared with 1881, increased by over 2 millions, the greatest increase being in the case of towns of 100,000 and over (561,000)

A uniform definition of a town has been used since 1901.* The definition adopted at the census of that year was practically the same as that used in 1891, but there were some differences in its application in respect of towns with a population exceeding 5,000 persons which were not under the operation of the law relating to municipalities.

* A town includes:—
(1) Every municipality of whatever size.
(2) All civil lines not included within municipal limits.
(3) Every cantonment.
(4) Every other continuous collection of houses, permanently inhabited by not less than 5,000, which the Provincial Superintendent may decide to treat as a town for census purposes.

The following table shows the distribution of population in towns grouped according to size and in rural territory, 1891 to 1921:— *Population in thousands.*

Class of places.	1921		1911	
	Places	Population	Places	Population
Total Population . .	687,935	316,017	722,492	313,488
Urban Territory . .	2,313	32,418	2,150	29,702
Towns having—				
I—100,000 and over . .	35	8,211	30	7,075
II—50,000 to 100,000 . .	54	3,517	45	3,010
III—20,000 to 50,000 . .	199	5,925	180	5,508
IV—10,000 to 20,000 . .	450	6,209	442	6,163
V—5,000 to 10,000 . .	885	6,223	847	5,936
VI—Under 5,000 . .	690	2,331	606	2,006
Rural Territory . .	685,622	283,598	720,342	283,786
	1901		1891	
Total population . .	730,750	294,317	715,959	287,006
Urban Territory . .	2,145	29,200	2,034	27,171
Towns having—				
I—100,000 and over . .	31	6,605	30	6,173
II—50,000 to 100,000 . .	52	3,414	48	3,255
III—20,000 to 50,000 . .	166	4,904	148	4,448
IV—10,000 to 20,000 . .	471	6,457	407	5,487
V—5,000 to 10,000 . .	856	5,938	896	6,164
VI—Under 5,000 . .	569	1,879	505	1,642
Rural Territory . .	728,605	265,116	713,925	259,834

Per cent. of total population.

	1921	1911	1901	1891
Total population . .	100	100	100	100
Urban Territory . .	10.2	9.5	9.9	9.5
Towns having—				
I—100,000 and over . .	2.6	2.2	2.2	2.2
II—50,000 to 100,000 . .	1.1	1·0	1.2	1.1
III—20,000 to 50,000 . .	1.8	1.8	1.7	1.6
IV—10,000 to 20,000 . .	2.0	2.0	2.2	1.9
V—5,000 to 10,000 . .	2.0	1.9	2.0	2.1
VI—Under 5,000 . .	.7	.6	.6	.6
Rural Territory . .	89.8	90.5	90.1	90.5

Growth of town population between 1891 1921 less than 1 per cent.

It will be seen that the growth of town population between 1891 and 1921 was less than 1 per cent. The progress of urbanisation in India, as we shall see, is very slow as compared with that in European countries.

Growth of the larger towns has been at the expense of medium sized towns.

The expansion of trade and commerce and the development of organized industries have had a marked effect upon the population of cities (over 100,000) and the larger towns. Between 1911 and 1921 the population of towns of above 50,000 increased 16 per cent., of towns of 20,000 to 50,000, 7.6 per cent., while that of towns of 10,000 to 20,000 by only .7 per cent. These figures show that the growth of the larger towns has been at the expense of the medium sized towns. Similarly in Western India, which is industrially more advanced than any other part of India, "the types of places which are losing to the cities are not the smaller villages but the middle sized country towns."*

Growth of town population in Germany 1871—1910.

The growth of towns is dependent upon the growth of industries. In view of the very slow development of Indian manufacturing industries it is not surprising that the progress of urbanisation in India should have been slow. This progress has been very rapid in European countries, such as Germany, which is explained by their rapid industrialisation. In 1800 about 90 per cent. of the population of Germany lived in places with less than 5,000 inhabitants, and only 10 per cent. in towns. The growth of the town population, particularly the population of cities, became rapid after 1850 and the pace increased after 1870. In 1850

† Census of India Vol. 1, Report p. 66.

there were in Germany only 5 towns with more than 100,000, 8 in 1870, 15 in 1880, 26 in 1890, 33 in 1900 and 48 in 1910. Between 1871 and 1910 the town population of Germany increased from 14,790,798 (36.1 per cent. of the total population) to 38,971,406 (60.0 per cent) and the rural population *decreased* from 26,219,352 (63.9 per cent.) to 25,954,587 (40.0 per cent.) The following table shows the distribution of population in Germany in towns grouped according to size, and in rural territory in 1910 :—

Class	Number of places	Population	
		Absolute	Per cent.
Large towns, over 100,000 . .	48	13,823,348	21.8
Middle sized towns, 20,000 to 100,000	223	8,677,955	13.37
Small towns, 5,000 to 20,000 . .	1,028	9,172,333	14.13
Country towns, 2,000 to 5,000 . .	2,441	7,297,770	11.24
TOTAL . .	3,740	38,971,406	60.02
1,000 - 2,000 inhabitants . .	4,984	6,798,904	10.46
500 - 1,000 ,, . .	11,686	8,090,857	12.46
100 - 500 ,, . .	40,516	10,250,420	15.79
Less than 100 ,, . .	15,013	822,406	1.27
Number of dwelling places in rural territory . .	72,199	25,954,587	39.98
GRAND TOTAL . .	75,939	64,925,993	100.00

The growth of the larger towns in Germany has not been, as in India, at the expense of the medium sized towns, but chiefly at the expense of the villages. Between 1871 and 1910 the percentage of the population living in country towns decreased from 12.4 to 11.24 and that of rural territory (*"Plattes Land"*—places with less than 2,000 inhabitants), decreased from 63.9 per cent. to 39.98, while the percentage of the population living in large towns (over 100,000) increased from 4.8 to 21.28.

Other foreign countries.

In Austria 91 per cent. of the population in 1843 lived in places with less than 5,000 inhabitants, and 9 per cent. in towns of over 5,000. In 1910

the proportions were 72.8 and 27.2. Between 1851 and 1911 the town* population of France increased from 25.5 per cent. of the total population to 44.2 per cent. The percentage of the population living in towns (more than 8,000 inhabitants) in the United States of America increased from 3.35 in 1790 to 29.20 in 1890, Taking a town to be a place with more than 2,500 inhabitants, the percentage of the population of the United States living in towns increased from 40.5 per cent. in 1900 to 46.3 per cent. in 1910. 9.2 per cent. of the total population of the United States in 1910 lived in towns of more than 1,000,000, and 22.1 per cent. in towns of more than 100,000 (Germany 21.28).

The growth of the urban population in England is shown by the following table :—

Place with a population of	Percentages 1891	1901	1911
600,000 inhabitants and over	14.6		
250,000 — 600,000 inhabitants	7.6	34.7	38
100,000 — 250,000 „	9.7		
50,000 — 100,000 „	9.0	9.9	10
20,000 — 50,000 „	12.7	13.6	13
10,000 — 20,000 „	8.2	9.2	9
5,000 — 10,000 „	6.3	8.3	8
3,000 — 5,000 „	2.6		
Under 3,000 „	1.3	1.3	
Urban population	72.0	77.0	78
Rural population	28.0	23.0	22

Between 1891 and 1911 the urban population increased and the rural population decreased 6 per cent.

The rapid growth of the town population is a characteristic feature of the movement of the population in European countries and the United States in the 19th century.

† Over 5,000.

The growth of the population of the principal cities of the world is shown by the following table:—

London.		Paris		Berlin.	
1170	40,000	*1637*	415,000	*1645*	9,000
1801	864,845	*1811*	622,636	*1800*	172,132
1900	4,536,063	*1896*	2,511,629	*1900*	1,884,151
1911	4,521,685	*1906*	2,763,393	*1910*	3,417,679*
	*7,251,358	*1911*	2,888,110	*1919*	3,803,770†
1921	4,483,249	Vienna.		Zurich	
	*7,476,168	*1637*	60,000	*1357*	12,375
		1800	231,949	*1850*	48,802
		1900	1,662,269	*1900*	150,239
		1910	2,031,421	*1910*	190,737
		1920	1,842,005‡	*1920*	210,992

Geneva.		Copenhagen.		Brussels.	
1693	16,111	*1635*	25,000	*1435*	56.368
1805	22,300	*1801*	100,775	*1786*	80,000
1900	104.044	*1901*	360,787	*1896*	194,505
1910	123,153	*1916*	*605,772	*1910*	*720.347
1920	136,939			*1919*	*831,396

Rome.		Venice		Petersberg	
1600	110,000	*1550*	165,000	*1700*	170,000
1750	153,000	*1750*	140,000	*1814*	335,713
1901	440.254	*1881*	131.691	*1901*	1,439,375
1911	542,123	*1911*	160,719	*1910*	1.905,819
1915	590,960	*1915*	168.038	*1920*	705,000

New York City	
1790	33,131
1890	1.515.301
1910	*2,492,591
1920	*4,766,883
1920	*5,621,151

India.

	Calcutta§	Bombay City	Madras and Cantonment
1872	—	644,405	397,552
1881	829,197	773,196	405,898
1891	932,440	821,764	452,518
1901	1,145,933	776,006	509,346
1911	1,272,279	979,445	518,660
1921	1,327,547	1,175,914	526,911

* With suburbs.
† Great Berlin.
‡ Provisional.
§ With suburbs, the Fort, the Port and Canals

Literacy.

Test of literacy.

For census purposes a person is considered literate in India who can write a letter to a friend and read the answer thereto. This definition of a literate person was used at the censuses of 1911 and 1921, and thus the returns of literacy for the last two censuses are comparable. Before 1901 a triple classification was in use—learning, *i.e.*, under instruction either at home or at school or college, literate *i e.*, able both to read and write some language but not at the moment under instruction, and illiterate, *i.e.*, not under instruction and not able to read and write any language. The triple classification was abandoned in 1901 and the population was divided into two classes of literate and illiterate. But no definite test of literacy was adopted, and it was left to the local staff to determine whether a person was to be classed literate or illiterate. The standard must have varied in different provinces, and the figures for 1901 are therefore not of great value for comparative purposes.

Proportion of literate males and females.

The number of literate per mille at certain age periods in 1921 and 1911 is compared below:—

All ages 10 and over.				15—20				20 and over			
Male		Female		Male		Female		Male		Female	
1921	1911	1921	1911	1921	1911	1921	1911	1921	1911	1921	1911
161	140	23	13	174	144	36	21	171	150	20	12

During the last decade the number of literate persons increased from 18.5 to 22.6 millions, and the proportion of literate males from 140 to 161 and of literate females from 13 to 23.

Excluding children under 5 years, 82 in every thousand of the population (139 males and 21 females) were literate in 1921. The proportions of literate males and females per mille between five and ten, and ten and fifteen in 1921 were as follows:—

5—10		10—15	
Male	Female	Male	Female
29	10	110	28

The proportion of literate males (1921) is highest for the age group 15-20 (174); thereafter it drops. As we shall see, in European countries also there is a fall in the proportion of literate persons after the age of 20.

It is not easy to compare the proportions of literate and illiterate persons for different countries of the world, as the tests of literacy used in different countries are not the same. In most countries, however, an illiterate person for census purposes is considered to be one who can neither read nor write. When we compare the proportion of literate persons in other countries with that in India we find that in spite of the spread of education and the steady rise in the number of literate persons during the last thirty or forty years, the proportion of literate persons, among the civilised countries of the world, is the lowest in India.

Comparison with other countries.

The following table shows the number of illiterate persons per 10,000 of each sex:—*

* H. d. S. Analphabeten, p. 273.

[TABLE

Country	Yaer of census	More than ..... years	Males	Females	Persons
India ..	1921	5	8,610	9,790	9,180
Prussia ..	1871	9—11-12	950	1,473	1,217
Austria ..	1910	10	1,614	2,124	1,871
Hungary ..	1910	9	—	—	3,330
France ..	1901	5	1,511	2,033	1,777
Italy ..	1911	6	4,280	5,050	4,670
Spain ..	1900	0	5,577	7,142	6,378
Portugal ..	1911	7	6,080	7,740	6,970
Servia ..	1900	6	6,616	9,264	7,897
Bulgaria ..	1901	6	—	—	7,237
Roumania ..	1909	7	4,580	7,670	6,060
Belgium ..	1910	7	1,257	1,500	1,378
Ireland ..	1911	9	900	940	920
Russia (whole) ..	1897	9	6,164	8,310	7,244
European Russia (without Poland) ..	1897	9	5,721	8,244	7,015
United States of America:					
Whites ..	1910	10	500	490	500
Blacks ..	1910	10	3,010	3,070	3,040
Canada ..	1901	5	—	—	1,438

For India, even if we take the age group 15-20, which shows the highest proportion of literate persons (174 males and 36 females per mille), the proportion of illiterate persons 8,260 males and 9,640 females per 10,000 of each sex, are the highest in the world.

The progress of literacy in certain countries may be judged from the following figures:—

	Decrease in the proportion of illiterate persons
Austria, 1890-1910 ..	35.4 per cent.
France, 1872-1901 ..	43.2 ,,
Italy, 1881-1911 ..	24.6 ,,
Belgium, 1880-1910 ..	59.8 ,,
Ireland, 1881-1911 ..	61.2 ,,
United States, 1880-1910	
Whites ..	46.8 ,,
Blacks ..	56.6 ,,

In Prussia, of each 10,000 men and women who got married, 1,619 males and 3,954 females born in 1821-25 could

not sign the marriage register; the proportions for those born in 1861-65 fell to 546 men and 3,741 women, while the average number of males and females who were unable to sign the marriage register in 1916-17 per 10,000 of each sex was only 80 males and 101 females.

In India as well as other countries there are more literate males than females.

Decline in the proportion of literate persons after 20.

Generally, though not in every case, the proportion of literate persons declines after 20, as the following table will show:—

	Illiterate persons per 10,000			
	6—20 years		Over 20 years	
	Males	Females	Males	Females
Hungary, 1910 ..	2,537	2,890	2,962	4,352
Ireland, 1901 ..	781	657	1,478	1,623
Belgium, 1910 ..	2,080	1,840	1,427	1,987
France, 1901 ..	1,358	1,312	1,571	2,302
Italy, 1911 ..	3,382	3,555	3,433	4,774
Portugal, 1900 ..	7,591	8,392	6,244	8,270

Belgium and Portugal show appreciably lower proportions of illiterate persons over 20 years than the proportions for 6-20 years. In India in 1911 the number per mille of literates of the age 20 and over was found to exceed the proportion in the group 15—20 (150 against 144), and in 1921, ten provinces and States and five religions showed a larger proportion of literate males over 20 than between 15 and 20. It is difficult to account for the increase in the proportion of literate males over 20, for it is more natural to expect a lapse from literacy rather than an increase in the higher ages. If, however, as is the case with certain classes, education begins late, or if the test of literacy is applied more strictly in the case of youths than in that of older persons, the proportion of literate persons may show an increase in the higher age-groups. At any rate we know that the rise in the proportion in the higher-groups is nothing peculiar to certain Indian provinces and States, for the same phenomenon is witnessed in certain other countries also.

V

OCCUPATIONS OF THE PEOPLE

The occupational census of India, taken along with the general census in 1921, is of considerable interest to the student of ecomonic history. The results are particularly interesting when we compare the occupations of the people in 1921 with those at other censuses, and with those of the people in other civilized countries of the world.

The first occupational census, 1881.

The first occupational census of India was taken in 1881, but the results of this census are not very valuable, for no attempt was made to determine the supporting power of each means of livelihood. The return was that of workers only, and it was very defective—that of working females was declared by the Census Commissioner "to be unworthy of examination." As regards male workers, out of a total of about 130 millions, 48,794,195 (37·6 per cent. of the male population) were classed "Unspecified and of no stated occupation." A large proportion of this class was the child population. The remaining 115,417,056 of the male workers were divided and sub-divided under various occupational heads. We may note that 51 millions of this number were agriculturists, and a little over 7 millions, "indefinite labour," mostly agricultural labourers. Workers in various industries, excluding miners, workers, in coal, stone and clay, salt and water, numbered about 12 millions, or 14.8 per cent. of the total male workers. The agriculturists, including "indefinite labour," formed 71·9 per cent. of the male workers.

It is difficult to compare the results of the first Indian census according to occupation with those of other censuses, for

an entirely new system of classification was adopted in 1891. There have been some changes in classification at each census, but those made since 1891 have been of a minor nature, and errors due to them can be rectified. We therefore proceed to consider the results of the census of 1891.

Census of 1891.

The whole population of India was divided into seven classes :—(A) Government, (B) Pasture and Agriculture, (C) Personal Service. (D) Preparation and Supply of Material Substances, (E) Commerce and Transport, (F) Professional and (G) Indefinite and Independent. In 1901 class (G) was split up into (G) unskilled labour, not agricultural and (H) means of subsistence independent of occupation, and some other minor changes were made in classification. Class (A) consisted of three orders, Administration, Defence and Service of native and foreign States; Class (B) included provision and care of animals, and Agriculture in class (B) included landholders and tenants, agricultural labourers growers of special products and those employed in agricultural supervision etc.; class (D) comprised workers in various industries; class (F) consisted of those engaged in learned and artistic professions and sport; class (G) comprised two heads: earthwork and general labour, and indefinite and disreputable occupations, and the last class (H) consisted of those dependent on income from property and alms, and the population of jails.

[TABLE

The following tables compares the occupations of the people in 1891 and 1901 according to the eight classes mentioned above :

Class	1901		1891		Variation. Increase (+) Decrease (—)	Variation. Increase (+) Decrease (—) per cent.
	Population supported by (000 omitted)	Percentage of total population	Population supported by (000 omitted)	Percentage of total population		
All occupations . .	294,186	—	287,223	—	+6,963	+2
A. Government . .	5,608	1.9	6,765	2.4	—1,157	—17
B. Pasture & agriculture . .	195,668	66.5	175,381	61.1	+20,287	+12
C. Personal service	10,718	3.7	11,210	3.9	—492	—4
D. Preparation and supply of material substances . .	45,677	15·5	48,631	16.9	—2,954	—6
E. Commerce, transport and storage	7,679	2.6	8,681	3.0	—911	—11
F. Professional . .	5,056	1.7	5,823	2.0	—767	—13
G. Unskilled labour, not agricultural . .	18,691	6.4	25,958	9.0	—7,267	—28
H. Means of subsistence independent of occupation . .	5,001	1.7	4,774	1.7	+227	+5
		100		100		

Explanation of increase in the proportion of agriculturists.

It will be noticed that as compared with 61.1 per cent. of the population dependent upon pasture and agriculture in 1891, 66.5 per cent. were classed under this head in 1901. The percentage of persons dependent upon agriculture alone (excluding pasture) in 1901 and 1891 was 65.1 and 59.9 respectively. But there was an important change in classification in 1901. In 1891 all dual occupations were tabulated under the non-agricultural head, so that the proportion for 1891 refers to those who were solely dependent upon

agriculture. The proportion for 1901 includes those with other occupations, who named agriculture as one of their chief sources of livelihood. If we include persons who combined agriculture with subsidiary occupations, the proportion of agriculturists rises to 64.5 for 1891 and 67.5 for 1901. There is still a difference of 30.0 per mille or 3 per cent.. which has to be accounted for.

The number of agriculturists under-stated in 1901.

According to the Census Commissioner for 1901 the difference was due to two causes:(1) a large shifting of labour from the non-agricultural to the agricultural head, and (2) the understatement of the number of persons probably dependent upon agriculture in 1891. He did not think that the increase in the number of persons dependent upon agriculture indicated "a greater dependence on the land due to the abandonment of weaving and other indigenous industries."* In 1911, however, the number of landlords and cultivators increased from 155 (1901) to 175 millions, and of farm servants and field labourers from 34 to 41 millions. The increase was again partly due to changes in the method of classification. As regards farm servants and field labourers it was found that in Bengal and Behar and Orissa the number of unspecified labourers was less than it was in 1901 by nearly 4 millions, in the United Provinces by a million and a half and in Bombay and Hyderabad by over a million. The Census Commissioner for 1911 considered it probable that the decrease was not real; the great majority of the labourers were field labourers and classified as such in 1911, while they were classed as "Labour unspecified" in 1901. Again, the census of 1901 was taken at a time when agriculture was unduly depressed on account of the famine of 1899-1900, and the demand for agricultural labour was below the normal, while the census of 1911 came at a time when agricultural conditions were very favourable.

*Census of India 1901 Vol. I, Part I, p. 207, Sec. 339.

It would thus appear that there was under-statement of the number of persons dependent upon agriculture in 1901, and that the increase in the proportion of the agricultural class as compared with 1891 was not wholly fictitious.

Census of 1911. Increase in the number of landlords and cultivators "not wholly unreal."

While commenting upon the growth in the number of landlords and cultivators in 1911 (13 per cent., or double that of the general population) the Census Commissioner pointed out that while the increase was partly due to changes in the method of classification, it was not wholly unreal. "At the same time," he said, "there seems to be no doubt that the number of persons who live by cultivation is increasing at a relatively rapid rate. On the one hand, the rise in the price of food grains has made agriculture more profitable, while on the other hand, the profits of various artisan classes have been diminished, owing to the growing competition of machine-made goods, both locally manufactured and imported, with the result that these classes show a growing tendency to abandon their traditional occupations in favour of agriculture."*

The following table compares occupations under the main heads in 1911 and 1901:—

* Census of India, 1911. Vol. I Part I, Sec. 530 p. 413.

[TABLE

	Population supported in		Percentage of variation
	1911	1901	
	In thousands		
Total population	304,233	285,398	+6.6
A. Production of raw materials	220,678	192,144	+14.8
I. Exploitation of the surface of the earth (pasture and agriculture, fishing and hunting)	220,160	191,910	+14.7
II. Extraction of minerals . .	517	234	+120.3
B. Preparation and supply of material substance . .	56,354	55,890	+.8
III. Industry	34,245	34,296	—.7
IV. Transport	4,877	3,769	+29.4
V. Trade	17,230	17,824	—3.3
C. Public administration and liberal arts	10,352	10,418	—.6
VI. Public force . .	2,254	2,096	+7.6
VII. Public administration .	2,459	3,161	—22.2
VIII. Professions and liberal arts	5,114	4,525	+13.0
IX. Persons living principally on their income . .	523	635	—17.7
D. Miscellaneous	16,847	26,944	—37.5
X. Domestic service . .	4,509	4,645	—2.9
XI. Insufficiently described occupations . .	9,015	17,776	—49.1
XIII. Unproductive . .	3,293	4,522	—27.2

Decrease in the number supported by Industry.

It will be seen that the proportion of B, Preparation and supply of material substances, was slightly higher in 1911 than in 1901, but Industry declined by .7 per cent. The principal variations under industry were as follows :—

[TABLE

	Per cent.
Textiles	— 6.1
Hides, skins and hard material from the animal kingdom	— 33.9
Wood	+ 14.5
Metals	— 6.6
Ceramics	+ 8.7
Chemical products properly so called and analogous	— 5.6
Food industries	— 2.6
Industries of dress and the toilet . .	+ 3.3
Furniture industries	+ 66.2
Building industries	+ 18.2
Construction of means of transport . .	— 21.5
Production and transmission of physical forces (heat, light, electricity, motive power, etc.)	+179.4
Industries of luxury and those pertaining to literature, arts and sciences	+ 9.2
Industries concerned with refuse matter . .	— 16.4

The largest increase was under production and transmission of physical forces, over 179 per cent. But this is of small importance, considering that it gave employment to only 14,000 persons in 1911 (.04 per cent. of the total number under industry). The more important industries are textiles (over 8 million persons in 1911), industries of dress and the toilet (over 7½ millions) and wood and food industries (over 3½ millions each).

There was an increase in the percentage supported by industries of dress and the toilet (3.3), and wood (14.5). The number of those supported by food industries declined 2.6 per cent., while under textiles there was a more serious decline of 6.1 per cent.

Textile industries.

The most important of the textile industries are those connected with cotton. The proportion of the population supported by cotton spinning, sizing and weaving in 1911 was 37 per mille in the Punjab, 29 in Bombay and Rajputana, 27 in Madras, 22 in the Central Provinces and Berar, and 18 in the United Provinces. The decrease of 6.1 per cent. in the number of persons supported by textile industries was due mainly, says the Census Commissioner for 1911, "to the almost complete extinction of cotton spinning by hand. Weaving by hand also suffered severely from the competition of goods made by machinery both in Europe and in the country". The number of Indian cotton mills, and that of factory workers had increased, but as the output per head in a factory is greater than that of hand-looms, the increase in the number of factory workers would imply the displacement of a larger number of hand-workers.

Other industries.

Other industries which were seriously affected by the competition of machine-made goods were hides and skins, and metals. The table given above shows that there was a large decline in the number of workers in hides. This is partly compensated by an increase in the number of boot and sandal makers. But the two groups taken together show a decline of about 6 per cent. During the same period the number of hide dealers more than doubled, owing to the growing demand abroad for Indian hides and skins and the expansion of the export trade in these articles. "The local cobbler on the other hand," says Mr. Gait "having to pay more for his raw material (on account of the rise in the price of hides and skins) and feeling the increasing competition of machine-made goods has been tempted to abandon his hereditary craft for some other means of livelihood, such as agriculture or work in factories of various kinds."*

* Census of India, 1911 Vol. I, Part I, Sec. 540, p. 419.

The case of metals was similar. The total number of persons dependent on metal industries decreased 6.6 per cent. as compared with 1901, while the number of dealers in metals increased six times. "The decrease in the number of metal workers and the concomitant increase in that of metal dealers is probably genuine and is due largely to the substitution, for the indigenous brass and copper utensils, of enamelled ware and aluminium articles imported from Europe."†

The census of 1921.

The census of 1921 showed a further increase in the number of agriculturists.

The following table compares the occupations of the people in 1911 and 1921 :—

† Census of India, 1911, Vol. I, Part I. Sec. 542, p. 420.

[TABLE

Population in thousands.

	1921		1911		Variation per cent.
	Population supported by	Percentage of total population	Population supported by	Percentage of total population	
Total population . .	316,055	—	313,470	—	+ .8
A. Production of raw materials . .	231,194	73.15	227,080	72.44	+ 1.8
I. Exploitation of animals and vegetation (including pasture and agriculture, fishing and hunting) . .	230,652	72.98	226,550	72.27	+ 1.8
II. Exploitation of minerals . .	542	.17	529	.17	+ 2.3
B. Preparation and supply of material substances . .	55,612	17.59	58,106	18.56	— 4.3
III. Industry . .	33,167	10.49	35,320	11.27	— 6.0
IV. Transport . .	4,331	1.37	5,028	1.60	—13.8
V. Trade . .	18,114	5.73	17,756	5.69	+ 2.0
C. Public Administration and liberal arts . .	9,846	3.12	10,456	3.48	— 5.8
VI. Public force . .	2,181	.69	2,398	.77	— 9.0
VII. Public administration . .	2,643	.84	2,648	.84	— .1
VIII. Professions and liberal arts . .	5,020	1.59	5,409	1.70	— 7.1
D. Miscellaneous . .	19,402	6.14	17,826	5.52	+ 8.8
IX. Persons living principally on their income . .	479	.15	540	.17	—11.1
X. Domestic service . .	4,570	1.44	4,599	1.47	— .6
XI. Insufficiently described occupations . .	11,098	3.51	9,236	2.95	+20.1
XII. Unproductive . .	3,253	1.04	3,451	1.10	— 5.7

Persons dependent upon pasture and agriculture increased 1.9 per cent., while those dependent upon fishing and hunting decreased. The rate of increase in the case of agriculturists was faster than the growth of population (1.2 per cent.).

Preparation and supply of material substances showed a decline of 4.3 per cent., and industry of 6.0 per cent. The percentage variation in the case of different industries is shown below :—

Textiles	—5.4
Hides & skins, & hard materials from the animal kingdom	+1.8
Wood	—4.9
Metals	—3.1
Ceramics	—1.1
Chemical industries properly so called & analogous	—3.8
Food industries	—16.4
Industries of dress & the toilet	—4.1
Furniture industries	—31.0
Building industries	—14.9
Construction of means of transport	—6.7
Production & transmutation of physical forces (heat, light, electricity, motive power etc.)	+72.9
Other miscellaneous & undefined industries	—4.2

It will be seen that industries "substantially" decreased.

Industries "substantially" decrease.

Those supported by textile industries decreased by 448,842, wood industries by 186,309, and metals by 59,237. Trade increased 2 per cent. While commenting on the increase in the number of persons supported by trade, the Census Commissioner for 1921 pointed out that it was difficult to distinguish between traders and manufacturers in India, as in many cases the maker or the producer himself sold his goods. But there is very little possibility of decline in industries being due to errors of classification, as those who both made goods and sold them were tabulated as manufacturers.

Increase in the pressure of the population on the soil.

Owing to change in classification it is difficult exactly to determine the percentage increase in the number of agriculturists and decrease in that supported by industries in 1921 as compared with 1881, 1891 or 1901. But from what has been said above it will be clear that throughout the last forty years there has been a tendency towards an increasing dependence upon agriculture, as the result of which industries have suffered. The Famine Commission of 1880 expressed the opinion that "at the root of much of the poverty of the

people of India, and of the risks to which they are exposed in seasons of scarcity, lies the unfortunate circumstance that agriculture forms almost the sole occupation of the masses of the population," and they recommended the development of manufacturing industries as a means of lessening the pressure of the population on the soil. But so far from diminishing, the pressure of the population on the soil has increased, while a smaller proportion of the people are supported by industries.

Having obtained a general view of the occupations of the people of India we proceed to compare the conditions here with those in other civilized countries of the world.

Proportion of workers to the population in India and foreign countries.

The proportions of actual workers of both sexes to the total male and female population respectively, and of the total number of workers to the total population in various countries are shown below:—

	Percentage of male workers to the total number of males	Percentage of female workers to the total number of females	Percentage of workers of both sexes to the total population
India, 1921 . .	61.9	29.8	46.3
Germany, 1907 . .	61.1	30.4	45.5
Austria, 1910 . .	61.5	43.5	52.3
Hungary, 1910 . .	61.5	22.5	41.8
Switzerland, 1910 . .	63.9	31.7	47.5
Italy, 1911 . .	66.1	29.0	47.2
Spain, 1910 . .	66.4	9.9	37.4
France, 1906 . .	68.2	38.9	53.3
Belgium, 1910 . .	65.1	29.2	47.0
Netherlands, 1909 . .	59.3	18.3	38.6
Denmark, 1911 . .	62.0	26.1	43.5
Norway, 1910 . .	56.1	23.0	38.7
Sweden, 1910 . .	58.8	21.7	39.8
England & Wales, 1911 . .	65.6	25.9	45.1
U. S. A., 1910 . .	63.6	18.1	41.5

The total population of India in 1921 was 318,942,000, of which 163,995,000 (51·4 per cent.) were males, and 154,946,000 (48·6 per cent.) were females. The population classified

according to occupation was, however, 316,055,000 2,887,000 less than the total population. The latter figure represented persons who were not enumerated by occupation in certain tracts. The sex of these persons is not separately shown, but assuming that, as in the case of the total population, 51.4 percent. Of them were males and 48.6 females, we find the total population classified according to occupation consisting of 162,512,000 males and 153,543,000 females (total 316,055,000). The number of workers was as follows:—

Male	Female	Total
100,609,000	45,804,000	146,413,000

The proportion of workers to the total population in the case of India compares favourably with those for other countries. France shows the highest percentage of total workers, 53.3, as well as of male workers, 68.2; Spain shows the lowest percentage of total workers, 37.4 and female workers 9.9. The highest percentage of female workers to the total female population is in Austria, 43.5. The proportion of all workers to the total population, and of the male workers to the male population in the case of India exceeds the figures for Germany, but Germany shows a slightly higher proportion of female workers. It may, however, be pointed out that the Indian agricultural worker is not fully occupied. It is estimated that the average cultivator in the Punjab does not perform more than 150 days' full labour in 12 months, and that even when he is busy, the Indian cultivator's idea of a full day's task is well below that prevalent in western countries.

Proportion of workers in different industries.

It is more interesting to compare the proportion of workers in different industries in the case of various countries. For the purposes of comparison we may take the figures given in Handwörterbuch der Staatswissenschaften (Beruf und Berufsstatistik p. 546).

The workers are divided into six classes. The first class "Land-und Forstwirtschaft, Fisherei und Tierzucht," corresponds to the Indian sub-class I, Exploitation of Animals and Vegetation. The second class "Industrie und Bergbau" is the same as Indian sub-classes II, Exploitation of Minerals and III Industry; "Handel und Verkehr" class III and "Oeffentlicher Dienst und freie Berufe" class IV, correspond to sub-classes Transport and Trade, and Public Administration and Liberal Arts of the Indian Census. For the fifth European class "Häusliche Dienste und Lohnarbeit wechselnder Art" we can only quote the figures of domestic servants in India, while no statistics of "Dienstboten im Hause ihrer Herrschaft lebend" class VI, are available for India.

Table showing the proportion per cent. of workers in different occupations to the total number of workers:

Country and year of census	Land, Forests, Fishing and hunting	Industry and Mining	Trade and Transport	Public Administration and Liberal Arts	Domestic servants etc.	Servants living in the house of their master
Germany, 1907 . .	35.2	40.0	12.4	6.2	1.7	4.5
Austria, 1910 . .	56.9	24.3	8.8	5.1	1.7	3.2
Hungary, 1910 . .	64.0	16.3	7.1	5.1	3.0	4.5
Switzerland, 1910. .	27.1	45.8	15.6	5.1	1.4	5.0
Italy, 1911 . .	55.4	28.1	8.3	5.0	0.3	2.9
Spain, 1910 . .	56.3	14.5	6.4	6.2	12.3	4.3
France, 1906 . .	42.7	31.8	12.5	6.7	2.4	3.9
Belgium, 1910 . .	23.0	46.9	17.6	5.9	2.4	4.2
Netherlands, 1909. .	28.4	35.0	19.7	6.4	1.2	9.3
Denmark, 1911 . .	42.7	25.3	14.9	4.7	2.3	10.1
Norway, 1910 . .	39.2	26.4	15.3	6.9	3.6	8.6
Sweden, 1910 . .	46.2	26.4	11.3	4.8	3.7	7.6
England 1911 . .	7·8	49.6	24.8	6.3	3.4	8.1
U. S. A., 1910 . .	33.2	33.2	22.9	4.9	1.3	4.5
India, 1921 . .	72.2	11.0	6.8	2.8	*1.7	—

* Domestic Service alone, Sub-class X, Order 52 of the Indian Census.

The number of workers in India in 1921 was as follows:—

			Per cent. of total workers
I.	Exploitation of animals and vegetation . .	105,688,373	72.2
II.	Mining and Industry	16,072,722	11.0
III.	Trade and Transport	10,019,785	6.8
IV.	Public Administration and Liberal Arts	4,115,210	2.8
V.	Miscellaneous	10,517,472	7.2
		146,413,562	100.0

Domestic servants are included under Miscellaneous. They number 2,532,000 and represent 1.7 per cent. of the total number of workers.

Percentage of workers employed in industries in India lowest among civilized countries.

It will be seen that the percentage of those employed on the land etc., is lowest in England and Wales (7.8), and highest in India (72.2). Among European countries the highest percentage of workers in class I is shown by Spain, 64.0. The case of England, is of course exceptional. It is the Industriestaat *par excellence*, and agriculture there is of little importance. The industrially advanced countries of Europe are Germany, Switzerland, France, Belgium and Netherlands. Austria, Hungary, Italy, Spain, Denmark, Norway and Sweden are industrially less advanced, as shown by the comparatively smaller proportion of workers who are employed in industries in these countries. In the United States of America industrial development has proceeded side by side with advance in agriculture

The percentage of workers employed in industries in India is lowest among the civilized countries of the world. Even Spain and Hungary show higher percentages. As regards Trade and Transport, the figure for India is the lowest, excepting Spain. The Census Commissioner for 1921 thus comments on the small proportion of traders in India as compared with European countries:—

"It was explained in para 203 above that those who both made and sold goods were tabulated as manufacturers, and the fact that in India the maker or producer is usually himself the seller accounts both for the small proportion of traders compared with European countries and the fluctuations in numbers under Industry and Trade in the Indian census tables, since the two are practically interchangeable in so large a number of cases.''*

The number of makers or manufacturers in India, however, is very small, and by combining the figures for mining, industry, trade and transport we get only 17.8 per cent. of workers as compared with the over 72 per cent. for workers on the land etc. The following table compares the proportion of workers employed on the land with those for industry and mining, and trade and transport combined:—

	Land etc.	Industry, Mining, Trade & Transport
India	72.2	17.8
Germany	35.2	52.4
Austria	56.9	33.1
Hungary	64.0	23.4
Switzerland . .	27.1	51.4
Italy	55.4	36.4
Spain	56.3	20.9
France	42.7	44.3
Belgium	23.0	64.5
Netherlands. . .	28.4	54.7
Denmark	42.7	40.2
Norway	39.2	41.7
Sweden	46.2	37.7
England	7.8	74.4
U. S. A.	33.2	56.1

Relative importance of agriculture and industry in England and India.

It will be seen that in England the proportion of workers in mining, industry, trade and transport combined exceeds the proportion of workers employed in agriculture in India. One may say that the preparation and supply of material substances, including mining, has the same importance in England as agriculture in India.

* Census of India, 1921, Vol. I, Part I, p. 258, Sec. 233.

These figures enable us to realise the difference between an industrial country and an agricultural country, and also the extent of our backwardness in industries as compared with other countries.

Increase in the proportion of the population supported by mining and industry in every country except India.

It may be of interest to consider the changes in the occupations of the people in various countries of the world at the last census as compared with the previous censuses. The following table shows the percentages of the total population supported by exploitation of animals and vegetation, mining and industry, and trade and transport at the last two censuses in various countries, and the percentage increase or decrease under the three main heads:—

Percentage of total population supported by :—

	Year of census	Exploitation of animals and vegetation	Mining and industry	Trade and transport.
Germany	1907	28.6	42.2	13.4
Austria	1910	48.4	26.5	12.4
Hungary	1910	64.5	17.1	6.5
Italy	1911	34.2	16.9	5.0
Spain	1910	21.1	5.2	1.5
*France	1911	40.7	35.8	9.8
Netherlands	1909	10.9	13.5	7.5
Denmark	1911	36.4	27.3	16.6
Switzerland	1910	27.7	42.7	16.4
Norway	1910	43.8	25.4	15.2
Sweden	1910	48.4	32.3	13.5
Finland	1910	66.3	12.2	5.1
Great Britain and Ireland (workers only) . .	1911	11.6	56.8	13.1
U. S. A. (workers above 10)	1920	26.3	33.4	17.6
India	1921	72.9	10.6	7.1

* Figures refer to workers only.

Percentage of total population supported by :—

	Year of census	Expoitation of animals and vegetation	Mining and industry	Trade and transport
Germany	1895	35.8	39.1	11.5
Austria	1900	52.4	25.2	11.6
Hungary	1900	68.4	14.4	5.2
Italy	1901	38.2	15.7	4.8
Spain	1900	24.3	5.3	1.5
*France	1901	41.8	30.9	13.4
Netherlands	1899	11.6	12.7	6.5
Denmark	1901	40.0	27.5	14.2
Switzerland	1900	33.2	41.7	13.7
Norway	1900	44.3	25.8	15.5
Sweden	1900	54.4	28.2	10.6
Finland	1900	58.0	10.6	4.7
Great Britian and Ireland (workers only)	1901	12.7	56.6	12.1
U. S. A. (workers above 10)	1910	33.2	30.4	16.4
India	1911	72.3	11.4	7.3

Percentage Increase (+) Decrease (—)

	Expoitation of animals and vegetation	Mining and industry.	Trade and transport.
Germany	— 4.4	+30.3	+38.7
Austria	+ .9	+ 7.9	+35.9
Hungary	+ 2.2	+29.2	+35.6
Italy	— 3.8	+16.2	+11.9
Spain	— 7.4	+ 3.6	+ 7.4
*France	+ 3.3	+23.0	—22.7
Netherlands	+ 8.4	+21.5	+33.1
Denmark	+ 2.3	+11.7	+32.3
Switzerland	— 5.6	+15.9	+35.4
Norway	+ 4.0	+ 3.3	+ 3.2
Sweden	— 4.4	+23.4	+37.3
Finland	+23.2	+23.9	+15.8
Great Britain and Ireland (workers only)	+ .3	+10.8	+19.1
U. S. A. (workers 10)	—13.5	+19.6	+15.9
India	+ 1.8	— 6.0	— 1.5

* Figures refer to workers only.

The table shows an increase in the percentage of the population supported by mining and industry in every country, with the sole exception of India. There has been a decrease in the population supported by trade and transport only in two cases, France and India. The decrease in France seems incomprehensible. Perhaps it is explained by the very large increase in the proportion supported by mining and industry, which was much faster than the growth in the number of workers, In the case of the following countries the percentage increase under mining and industry was faster than the growth of the population: Germany, Hungary, Italy, Netherlands, Switzerland, Sweden, Finland, Great Britain and Ireland and the United States of America. In India the increase under agriculture was faster than the growth of the population.

Decrease in the proportion of population supported by trade and transport in France and India.

Figures for Belgium and Russia have not been quoted in the table. As regards Belgium, owing to changes in classification it is difficult to compare the results of the census of 1910 with those of 1900. But it is stated that "if a comparison with the census of 1900 were possible, it would most probably show an increase in the industrial population, for industry was constantly increasing in importance till 1900, chiefly at the expense of agriculture."

Belgium.

As for Russia, according to the census of 1897, the workers numbered 31,271,000 out of a total population of 125,640,000 or 24.9 per cent. Of the workers, 58.3 per cent. were employed on the land, 16.6 per cent. in mining and industry, and 7.7 per cent. in trade and transport. The census of 1920 took account of persons, capable of working, between the ages of 16-50 only. According to this census, the figures of which are not very

Russia.

reliable, 79 per cent. of the workers between the ages of 16-50 were employed on the land, and the remaining 21 per cent. in other industries.

If we exclude Russia from our consideration, where conditions in recent years have been very unsettled, it will appear that, among the civilized countries of the world, India alone has the distinction of showing a steady decrease in the proportion of the population supported by industries. What is the explanation of this very strange phenomenon?

Causes of the movement from agriculture to manufacture in western countries.

We shall be in a better position to understand the conditions in India if we first briefly consider the causes of the movement of labour from agriculture to industries in western countries. It will be sufficient for our purposes if we take a typical manufacturing country and analyse the factors which have a bearing on the changes in the occupations of its population.

The case of Germany.

The total number of persons dependent on agriculture, fishing and hunting in Germany decreased from 19,225,455 in 1882 to 17,681,176 in 1907—from 42.5 per cent. of the total population to 28.6 per cent. During the same period, those dependent upon mining and industry increased from 16,058,080 (35.5 per cent. of the total population) to 26,386,537 (42.8 per cent.) and those dependent upon trade and transport, from 4,531,080 to 8,278,239 (from 10.0 per cent. of the total population to 13.4 per cent.)

Between 1895 and 1913 imports into Germany increased from 4246 to 10,770 and exports from Germany from 3,424 to 10,096 million Marks. These figures, says Waltershausen, show "die gewaltige Teilnahme Deutschlands an der Weltwirtschaft".* During this period Germany was becoming an industrial country, which may be inferred from the increase

*Deutsche Wirtschaftsgeschichte 1815—1914, p. 461.

in the exports of manufactured goods, and in the imports of raw materials. Germany was, however, able to avoid the one-sided development of a country like England, which enabled her to resist the Allies for more than four years, though she was cut off from the rest of the world.

The decline of cottage industries and the growth of large-scale production.

The development of German industries was at the expense of agriculture, and of cottage industries. We have already seen that there has been an absolute decrease in the numbers supported by agriculture in Germany; as regards her cottage industries it is significant that in 1907, while 90 per cent. of the total number of businesses were small businesses (employing 1-5 persons), these businesses gave employment to only 29.1 per cent. of the total number of workers. The large businesses (employing more than 50 persons), 1.3 per cent. of the total number of businesses, employed 47.7 per cent. of the workers. The number of small businesses and persons employed therein decreased from 2,175,857 to 1,870,261, and from 3,270,404 to 3,200,282 respectively; while during the same period (1882-1907) the number of large businesses increased from 9,481, to 29,033, and persons employed therein from 1,554,131 to 4,937,927. The total number of businesses decreased from 2,270,339 in 1882 to 2,086,368 in 1907, while the number of persons employed increased from 5,993,663 to 10,852,873, thus showing the tendency towards concentration in industry.

It has been well said that "The history of cottage industries is the history of capitalism." The decay of cottage industries is undoubtedly due to the rise of capitalism. There is no branch of handwork which has not been affected by capitalism in the leading European countries.

As in Germany and England, the last 40 years have been a period of the decline of cottage industries in India. But while the decline of cottage industries in Germany and England is due to the growth of capitalism in these countries, the decline of Indian cottage industries is principally due to the progress of foreign, not so much of Indian, capitalism. This is explained when we consider figures of India's export and import trade between 1880-81 and 1920-1921.

The decline of cottage industries in india due to growth of capitalism in western countries.

The statement below shows the value of the imports of foreign merchandise and exports of Indian merchandise in certain years :—

India's foreign trade, 1880-81 to 1922-23.

Lakhs of rupees.

	1880-81	1910-11	1920-21	1922-23
Imports of foreign merchandise . .	50,30	129,35	335,60	232,71
Exports of Indian merchandise . .	71,97	205,82	240,01	309,77

The very great expansion of both the import and the export trade will be noted. The year 1920-21 was, for special reasons, a record year for imports. The exports in that year were below the normal.

Imports into India consist mainly of manufactured goods, and exports of articles of food and drink and raw materials. In 1920-21 the percentage share of raw materials and food stuffs and manufactured goods in the imports and exports was as follows :—

	1920—21	
	Imports	Exports
I. Food, drink and tobacco . .	10.7	18.2
II. Raw materials and produce and articles mainly unmanufactured	5.2	44.5
III. Articles wholly or mainly manufactured	81.8	35.7
IV. Miscellaneous	2.3	1.6
	100.0	100.0

Thus in 1920-21, while 81.8 per cent. of the imports consisted of manufactured goods, 62.7 per cent. of the exports belonged to Groups I and II. In 1922-23 the percentage share in exports of Group I increased to 21.9, of Group II to 52.3, while that of Group III sank to 23.6. In 1922-23 no less than 74.4 per cent. of the exports consisted of raw materials and articles of food.

Increase in imports of manufactured goods.

The very considerable increase in the imports of particular classes of manufactured goods since 1880-81 is shown by the following table:—

Imports. Value in lakhs of Rupees.

	1880-81	1910-11	1920-21
Apparel	65	309	432
Chemicals	46	235	516
Cutlery	55	334	1,197
Dyes and colours	22	134	572
Electrical goods	—	51	418
Glassware	38	157	259
Hides and skins, tanned or dressed and leather	17	48	128
Machinery	77	473	2,408
Metals, iron and steel	162	943	3,123
„ other than iron and steel	216	505	934
Paper and stationery	59	165	912
Railway plant and rolling stock	111	424	1,413
Rubber manufactures	—	—	252
Vehicles	—	128	1430
Cotton yarns and fabrics	2,660	4,484	10,212
Jute „ „	3	15	26
Silk „ „	135	276	559
Woollen „ „	130	302	553

The influence of foreign trade on the occupations of the people.

In view of the development of our foreign trade and its character, it should not be difficult to understand that it has exercised the profoundest influence on the occupations of the people. Before the rise of modern capitalism India was a great manufacturing country. She excelled in hand-work of all kinds. In the past, industries must have supported a far larger proportion of the population than at the present time. But as soon as this terrible

competition with machinery began, Indian industries began to decline, and labour was more and more driven to the land. Western countries like Germany found room for the displaced hand-worker in factories. But in India the development of factory industries has proceeded very slowly.

Indian factory industries.

With the exception of jute and cotton, we had before the war no large factory industries. The progress of the more important factory industries is shown by the table given below :—

	Number of mills at work.	Nominal capital. Lakh Rs. or million £.	In thousands.		
			Persons employed.	Looms.	Spindles.
Cotton—					
1879-80 to 1883-84 . .	63	Rs. 567.6	51	14.5	1,610.6
1910-11 . .	250	„ 2236.5	230.8	84.6	6,346.7
1920-21 . .	257	„ 5533.5	332.1	123.7	6,870.8
Jute—					
1879-80 . .	22	Rs. 128 £. 1.4	27.5	4.9	70.8
1910-11 . .	58	Rs. 713 £. 2.9	216.3	33.1	682.5
1920-21 . .	77	Rs. 1923.5	288.4	41.6	869.9
Paper—					
1886 . .	6	Rs. 27.6	1.2	—	—
1910 . .	8	„ 50.3	4.6	—	—
1920 . .	9	„ 47.3	7.7	—	—
Wool—					
1886 . .	4	Rs. 18.0	1.3	.2	5.4
1910 . .	5	„ 50.5	3.4	.8	31.2
1920 . .	9	„ 51.7	9.0	1.4	46.6

The Indian cotton industry is fairly well developed, but it cannot supply the entire Indian demand for cloth. In 1920-21, 1,580 million yards of cotton goods were produced in Indian mills; the imports in the same year amounted to 1,491 million yards. The pre-war average for imports of cotton piece-goods was 2,617 million yards as compared with the home production of less than 1,200 million yards.

The total quantity of woollen goods produced in India in 1920 was 7.5 thousand lbs. valued at Rs. 154 lakhs. The value of imports is about three times as large.

The output of Indian paper mills is about 30,000 tons of paper per annum, while the imports in a normal year are about double the output of the Indian mills.

Some new industries were started during the war, the most important of them being the iron and steel industry, and the war period was generally a period of rapid industrial development. The effect of this development on the occupations of the people is not yet very noticeable, but it may be hoped that progress of industries, assisted as it now is by a policy of discriminate protection, will gradually reduce the proportion of the people dependent upon agriculture. Cottage industries in a country like India will never become extinct, but if they must suffer on account of the growth of factory production, it is preferable that this factory production should be Indian rather than foreign. In the past the history of our cottage industries has been the history of foregin capitalism, and this is largely true even to-day.

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VI

ORGANISED INDUSTRIES AND SOCIALISM

Chief features of modern industrial development.

The growth of large-scale production and concentration in production are the chief features of modern industrial development. In the preceding Chapter it has been shown that the growth of large businesses in European countries, such as Germany, has been at the expense of the cottage industry. We have seen that in Germany, between 1882 and 1907, the total number of businesses decreased, while the number of persons employed in them about doubled. The importance of large businesses in Germany is further shown by the following table:—

	1909.			
	Nnmber	Labourers in millions	Steam power in millions of horse power	Electricity in kilo. watts
All businesses . .	3,265,623	14.4	8.8	1.5
Large businesses (employing more than 50 persons) . .	30,588	5.7	6.6	1.2
Percentage .	0.9	39.7	75	80

It will be seen that less than 1 per cent. of the total number of businesses employed more than 39 per cent. of the total number of labourers, and used three-fifths of the total steam and electric power.

In the United States of America, in 1909, large businesses (those with an annual production of one million dollars or more), formed 1.1 per cent. of the total number of businesses, but they controlled 43.8 per cent. of the total annual production in the United States.

Industrial census of India.

For India we do not possess exact information about the number of the smallest businesses employing less than 10 persons, or the total number of persons to whom they give employment. The first industrial census was taken in 1911, and the second in 1921. At the census of 1911 information was collected about businesses employing 20 or more persons; and at the last census, about businesses employing 10 or more persons. The main results of these censuses are given in the tables which the reader will find at the end of this Chapter, and they are discussed below. But it should be remembered that the industrial statistics which we possess relate to organised industries which give employment to less than one per cent. of the population. Unorganised industries support 9 per cent. of the population, and thus the number of businesses employing less than 10 persons, and the total number of persons employed in them, must far exceed the number of businesses and persons employed in those for which statistics are available.

Increase in the number of businesses.

Businesses worked with mechanical power dominate organised industries.

Taking businesses employing more than 20 persons, we find that their number increased from 7,113 in 1911 to 10,969 in 1921, or 54.2 per cent. 64.2 per cent. of the total number of businesses in 1911 worked with mechanical power, and 35.8 without mechanical power. The proportions for 1921 are 56.9 and 43.1 respectively. 85.8 per cent. of the total number of labourers were employed in businesses working with mechanical power and 14.2 in businesses without mechanical power in 1911 as compared with 84.8 per cent. and 15.2 per cent. respectively in 1921. Thus in 1921 there was a decline in the proportion of businesses worked with mechanical power, and of the persons employed in them as compared with 1911. The relatively more rapid progress of businesses worked without

mechanica power is shown by the fact that their number increased 78.5 per cent. and the labour employed in them 39.3 per cent. in 1921, as compared with 39.3 per cent. increase in the number of businesses worked with mechanical power and 21.4 per cent. increase in the number of labourers employed in them. While businesses worked with mechanical power dominate organised industries, there is no tendency toward any general extinction of businesses worked without mechanical power.

Large businesses in 1921 and 1911.

That large businesses dominate organised industries is shown by the fact that in 1921 establishments employing 50 or more persons were 54.5 per cent. of the total number of businesses (employing more then 20 persons), and gave employment to 94.0 per cent. of the total labour force. 45.5 per cent. of the remainning businesses employed only 6.0 per cent. of the total labour. We may, however, note that in 1911 establishments with 50 or more persons formed 67.4 per cent. of the total number of businesses, and employed 96.5 per cent. of the total labour.

Businesses employing 400 persons or more.

The proportion of the largest businesses, those employing 400 persons or more, to the total number of businesses was 17.4 per cent. in 1911 and 12.8 per cent. in 1921. The proportion of labour employed in these largest establishments to the total number of employees was, for 1911, 73.9 per cent. and for 1921, 72.0. The proportion of businesses employing 20—50 persons rose from 32.6 per cent. in 1911 to 45.5 in 1921, and of labour employed in these businesses from 3.5 per cent. in 1911 to 6.0 in 1921. It is seen that between 1911-1921 businesses of moderate size (20-50) have gained instead of losing ground.

It is natural that the largest businesses (employing 400 persons or more) should be of greater importance in industries which use mechanical power. Out of 2,611,039 labourers

employed in all establishments (employing 20 or more persons) in 1921, 1,732,405 (66.6 per cent.) were employed in establishments of the largest size (400 or more persons) worked with mechanical power, and only 121,401 or 4.6 per cent. in similar establishments worked without mechanical power.

Large businesses are of importance in particular industries.

It has been said above that large businesses dominate organised industries. That is so, on the whole—they do not dominate every organised industry. Out of 16 Groups into which our industries are divided in the Census Tables, six Groups show the influence of large scale organisation. They are I Growing of Special Products, II Mines, IV Textiles and connected Industries, VII Metal Industries, IX Industries connected with Chemical Products, and XIV Construction of Means of Transportation and Communication.

Group I.

Group I is connected with the land. The more important industries in this Group are the following :—

	Number of establishments	Persons employed	
		Male	Female
Coffee Plantations	569	24,657	15,467
Rubber „	135	13,225	4,037
Tea „	1,413	384,836	362,825
Indigo „	73	6,513	355
Sugar cane „	17	1,756	777

The average number of persons employed per plantation is as follows :—

Tea	529
Sugar-cane	149
Rubber	127
Indigo	94
Coffee	71

It will be noted that in the first three industries only the average number of labourers employed exceeds 100.

Group II. In Group II Mines, collieries, gold, manganese and mica mines between themselves employ 175,387 males and 64,390 females, out of a total of 196,987 males and 69,756 females engaged in mining. The average number of persons per establishment in this group is 258.

Group IV. The more important industries in Group IV are the following :—

	Number	Persons employed	
		Male	Female
Jute Presses	223	10,450	796
Jute Mills	65	239,492	47,844
Cotton ginning, cleaning and pressing mills . .	1,418	56,941	26,114
Cotton weaving and other mills	613	277,696	72,983
Woollen mills	24	5,828	644
Silk	173	8,414	990
Dyeing Factories	63	3,482	380

Cotton and jute far outweigh all the others put together in importance. The average number of persons per establishment in the case of jute (mills) is 4,451, and cotton weaving 572.

Group VII. In Group VII, Metal Industries, 165 iron and steel works, (including working with iron sheets, making steel trunks, despatch boxes etc.) employ 39,449 persons; 321 metal, machinery and engineering (including Railway workshops) employ 82,182 persons, and 300 brass, tin and copper works employ 14,095 persons, a total of 135,726 out of about 170,000 employed in this group of industries. The number of establishments employing 400 persons or more is 6 among brass, tin and copper works; 6 among iron and steel works, and 40 among metal, machinery and engineering workshops.

Group IX.

Group IX, Industries connected with Chemical Products, comprises a large number of industries. The important industries in this Group are oil mills, paper mills and petroleum and salt refineries. There are 435 oil mills, but of these only 3 employ 400 persons or more; 11 paper mills employ 6,497 persons; 10 petroleum refineries (400 and over) employ 31,809 persons; and out of 201 salt refineries 8 employ 400 persons or more.

Group XIV.

The more important industries in Group XIV, Construction of means of Transportation and Communication are:

	Number	Persons employed	
		Male	Female
Motor Works	136	10,254	24
Railway Works	186	110,980	1,152
Shipyards, Dockyards etc	42	21,259	70

There are only 3 motor car works which employ 400 persons or more, and together they give employment to about 1,700 persons; 39 railway works of the biggest class employ about 94,000 persons and 14 shipyards, dockyards etc., give employment to over 18,000 persons.

Other industries.

As regards industries included in other Groups the following figures may be quoted :—

	Number	Persons employed	
		Male	Female
Group V. Leather Factories	48	2,865	107
Tanneries . .	188	9,743	752
Group VI. Saw Mills	246	19,920	868
Group X. Flour & Rice Mills	1,300	42,488	7,503
Sugar Factories	519	21,101	1,268
Group XII. Lime works and Kilns . .	295	13,904	4,338
Group XVI. Printing Presses . .	810	49,197	181

The number of establishments of the largest class (400 and more) in these industries, however, is small, as will be seen from the table given below :—

	Number	Persons employed	
		Male	Female
Leather factories	1	731	73
Tanneries	2	1,231	124
Saw mills	8	5,332	16
Flour and rice mills	6	3,701	285
Sugar factories	12	7,756	345
Lime and kiln works	3	1,065	439
Printing presses	22	15,132	32

Socialistic doctrines: how far applicable to India.

The foregoing review of the occupations of the people and of the position and relative importance of organised industries in India suggests some reflections on an important subject—socialism.

In the preface to the first edition of *Kapital*, Marx wrote: "The country that is more developed industrially only shows to the less developed the image of its own future" and further, "And even when a society has got upon the right track for the discovery of the natural laws of its movement... it can neither clear by bold leaps, nor remove by legal enactments, the obstacles offered by the successive phases of its normal development. But it can shorten and lessen the birth pangs."

The industrialization of India has begun, and the conditions in Bombay and Calcutta already resemble those in the centres of industry in western countries. The number of factory workers is increasing and attempts are being made to form labour unions after the European model. One hears a good deal about the "labour movement" in India, and even of the coming "proletarian revolution." It will,

therefore, not be inappropriate to consider how far socialistic doctrines apply to India under existing conditions.

Unpreparedness of India for a socialistic revolution in the Marxian sense.

As to the unpreparedness of India for a socialistic revolution such as Marx had in view there can be no question. Marx himself stated the conditions which the socialistic revolution pre-supposed: the industrialization of the country with the majority of the population reduced to the position of wage-earners, and centralization and concentration in production. Further, in order to attain political power, the proletariat must be well organised. The centralization of production and the misery of the working classes finally reach a point where they become unbearable, and then the exploited turn against their exploiters, and the capitalistic system comes to an end. We may quote again the following oft-quoted passage from *Kapital*:—

"Along with the constantly diminishing number of the magnates of capital, who usurp and monopolise all advantages of this process of transformation, grow the mass of misery, oppression, slavery, degradation, exploitation; but with this, too, grows the revolt of the working-class, a class always increasing in numbers, and disciplined, united, organised by the very mechanism of the process of capitalist production itself. The monopoly of capital becomes a fetter upon the mode of production, which has sprung up and flourished along with, and under it. Centralization of the means of production and socialization of labour at last reach a point where they become incompatible with their capitalist integument. This integument is burst asunder. The knell of capitalist private property sounds. The expropriators are expropriated."*

*Translation by Samuel Moore and Edward Aveling, pp. 788—89.

It is no longer disputed that the tendency towards large scale production is inherent in the capitalistic system, and that concentration in production at a certain stage leads to monopoly. As we have seen, the control of industry in countries like Germany and the United States of America has passed into the hands of a very small number of giant businesses.

No tendency towards concentration or monopoly in India.

Conditions in India in this respect are different. We have seen that large scale organisation dominates certain industries but not all. And even in those industries which are organised on a large scale, there is, as yet, no tendency towards concentration or monopoly. Concentration would show itself in a reduction in the number of businesses, while the size of each business increased. But the number of businesses even in industries organised on a large scale has increased, as will appear from the following table:—

Establishments worked with mechanical power.

	Total number of establishments.		Number of establishments employing 400 persons or more.	
	1911	1921	1911	1921
I. Growing of special products . .	991	1,190	553	576
II. Mines	373	588	131	130
IV. Textlies and connected industries	1265	1,942	231	275
VII. Metal Industries	257	500	36	62
IX. Industries connected with chemical products . .	252	450	13	33
XIV. Construction of means of transportation and communication	163	261	46	58

The total number of establishments in all the six groups of industries was higher in 1921 than in 1911. If we con-

sider establishments employing 400 persons or more, only mines show an insignificant reduction—in every other case there was an increase.

Progress of businesses of moderate size.

We should remember that, among organised industries, businesses worked without mechanical power are not decaying but more than holding their own, and that businesses of moderate size, 20-50, continue to prosper. The position of the latter is shown by the following statement:—

Establishments employing 20-50 persons worked with mechanical power:

	Number	Labour employed
1911	1,149	37,706
1921	2,245	72,930

Establishments employing 20-50 persons worked without mechanical power:

	Number	Labour employed
1911	1,171	37,589
1921	2,750	84,891

Thus even in organised industries, which support less than one per cent. of the population, there is no tendency towards the extinction of small businesses. We have undoubtedly the germs of capitalism in India, but capitalism has not yet arrived at the stage where "Die Konkurrenz verwandelt sich in ein Monopol" and "ein ungeheuerlicher Vergesellschaftungs-Prozess der Produktion" begins.*

No tendency towards centralization in banking.

Concentration in banking is another important feature of the capitalistic organisation of society. Of this England furnishes a good example. The position in India is again different. In the first place, no very close connection between banks and manufacturing industries exists in India, as in Germany, and in the second place, excepting one or two important instances of amalgamation, Indian banking has not yet been affected

* Imperialismus by Lenin, p. 11.

by the movement towards concentration. Indian banks are pigmy institutions; it would be ridiculous to compare them with the huge banking corporations of western countries.

Indian agriculture not organised on capitalistic lines.

We should not also forget that India is essentially an agricultural country, and Indian agriculture is not at all organised on capitalistic lines. The consequence of sub-division of land according to our laws of inheritance is that landed property is widely diffused among the masses of the rural population. The masses, indeed, are poor, but they are not property-less.

Labourers a minority of the population in India.

The labourers, in the sense of hired workers, form a minority of the population in India. Agricultural labourers, as we have seen, are 12 per cent. of the population. Industries, indeed, support 10 per cent. of the population, but a considerable proportion of these are engaged in unorganised industries. According to the Industrial Census, the total number of persons employed in 15,606 businesses in all India, excluding agriculture but including growing of special products as coffee, indigo, tea, rubber etc., and mining and quarrying, was 1,994,314 males and 686,811 females, a total of 2,681,125 persons, or .85 per cent. of the whole population.

The typical Indian worker.

It will appear that the position in India is very different from that in western countries like England, where the workers form the majority of the population. The typical worker in the West is the wage-earner who works for a master. The typical worker in India, whether on the land or in industries, is an independent man working on his own account. He is capitalist, entrepreneur and labourer rolled into one.

What will be the attitude of this independent worker towards socialiam ?

What will be his attitude torwards socialism.

Now I take it that socialism does not merely mean "Verstaatlichung." It will be easy to show that this or that industry in India can be taken over by the State, though "Verstaatlichung" also pre-supposses a high measure of concentration, leading to monopoly in production. But socialism means the abolition of private ownership of all means of production, including land, the most important of all instrumental goods.

"The foundation of a communistic society," we are told, "is the socialization of property in the means of production and transportation, *i.e.*, machines, apparatus, locomotives, steamships, factories, magazines, granaries, mines, telegraph, telephone, land and animals used in production are owned by society, which has power over their disposal. Neither an individual capitalist, nor an association of rich individuals has the right of disposal over these means (of production and transportation), but the society as a whole."*

In other words, all those who own any instrumental goods must be expropriated. This is not a simple matter even where the means of production have been monopolised by a microscopic minority of the population; it is utterly impossible in a country like India where the number of those to be expropriated far exceeds that of the expropriators. Take first the small peasant proprietor, as in the Punjab. He is poor and in debt and he lives miserably, but he is deeply attached to the small piece of land which is his own, and he would not brook any interference with his right of property. It is sometimes said that the State is the universal landlord in India. But let the State,

The peasant proprietor. Abolition of private property in land inconceivable.

* Das A. B. C. des Kommunismus, p. 58

powerful as it is, try to abolish the right of property in land so that the individual owner of the land cannot do with it as he likes, or leave it to his children after his death ! The State cannot attempt any such thing without risking a political revolution of the first magnitude, which would endanger its very existence. No particular class of the community is powerful enough to propose or carry through such a measure. It may be said that the interests of the hired landless agricultural labourers are opposed to those of the land-owning classes—but a social or political rising of the agricultural labourers against their masters is unthinkable. Not only are they numerically inferior, but their social position, traditions and habits of mind make a revolt against the existing system impossible. Not only in the Punjab but all over India where men are recruited for the army it is the cultivating classes who furnish the recruits. The Indian army is drawn from the peasant class. The labouring classes in the villages belong, not to the fighting castes, but to lower castes, such as sweepers, shoe-makers, and other servile castes who have no fighting spirit or fighting traditions. The socialization of land in the existing circumstances must be considered to be impossible.

Socialistic doctrines would certainly appeal to the property-less industrial worker, but for economic as well as political reasons the socialization of industry in the existing conditions seems to be not less difficult than the socialization of agriculture.

An industrial proletariat does not exist in India. The character of the factory worker.

An industrial proletariat in the proper sense of the term does not exist in India. The character of our factory labour is very unstable. The factory worker is an agriculturist. He has not yet made the town his home and work in the factory his permanent occupation. This largely explains the present unorganised state of Indian labour. The poverty, ignorance and illiteracy of the

worker are very serious obstacles to the formation of unions. True, selfless leadership is also lacking. Labour must learn to combine if it is to improve its economic position by putting economic pressure upon the capitalist class. The demand for industrial labour is constantly increasing, and on account of their small numbers industrial workers, if they are well organised, would be in a very favourable position for enforcing their demands. But owing to their small numbers and other causes they cannot put much pressure on the Government. And so far as the establishment of the "Diktatur des Proletariats" is concerned, it must in India remain a dream for a long time to come.

Economically speaking the socialization of industry in India seems to be impossible on account of the absence of concentration even in organised industries. Politically speaking, a proletarian revolution which would socialize industry is out of the question.

Differences of race, religion and caste.

The industrial proletariat in India is composed of many heterogeneous elements. In Bengal the great majority of the workers are outsiders; about 39 per cent. belong to Bengal. There are very few bonds of union among workers coming from Behar, Chhota Nagpur, Orissa, United Provinces, Madras and other parts of India. They speak different languages, profess different faiths, belong to different castes, and sometimes represent different levels of civilisation, as for example the intelligent Brahmin and the wild Santal and Bauri. Similarly the labour supply of Bombay is very heterogeneous, the labourers being drawn from different parts of India. Religion and caste are, as we in India know to our cost, very powerful factors of disunion. The organisers of the North-Western Railway Workers' Union personally assured the present writer that Hindu, Mussalman and Sikh employees of the North-Western Railway were able to act together when the first big strike was organised in 1920. When it is a

question of demanding higher wages or improving the conditions of work, workers of different communities may be expected to take common, united action. But when the fight for political power begins, communal differences will assert themselves, as they have already done. At the moment of writing the whole country, and particularly the Punjab, is plunged in a bitter communal strife, which owes its origin to the belief that under the reformed constitution the members of one community are getting more posts under the Government than those of other communities. The whole spectacle is demoralizing and disgusting, but its moral is obvious.

Further, in considering the possibility of an armed revolt of the working classes against property-owners, one is bound to give due weight to the fact that the majority of the industrial workers belong to non-fighting castes. They have been long under the influence of religion, and religion has still a powerful hold on their minds. The Hindu religion teaches the doctrine of class supremacy, and the lower castes still look up to the higher castes, who dominate industry, with instinctive respect. Of course the influence of old ideas is declining, but an up-rising of the proletariat pre-supposes a revolutionary change in their social and religious outlook, of which there are no signs at present.

Industrial Statistics, 1911 and 1921.

TABLE I.

	1911	1921	Increase per cent.
Total number of establishments	7,113	15,606	
Total number of establishments employing 20 or more persons . .	7,113	10,969	54.2
Establishments employing 20 or more persons :—			
Worked with mechanical power	4,469	6,248	39.3
Worked without „ „	2,644	4,721	78.5
Labour employed in all establishments	2,105,824	2,681,125	—
Labour employed in establishments with 20 or more persons . .	2,105,824	2,611,039	23.9
With mechanical power . .	1,806,003	2,193,453	21.4
Without „ „ . .	300,019	417,596	39.2
Establishments employing 10-20 persons : Total No. . .	—	4,637	—
With mechanical power , .	—	1,394	—
Without „ „ . .	—	3,243	—
Labour employed : Total . .	—	70,086	—
With mechanical power . .	—	21,170	—
Without „ „ . .	—	48,916	—
Establishments employing 20-50 persons : Total No. . .	2,320	4,995	115.3
With mechanical power . .	1,149	2,245	95.4
Without „ „ . .	1,171	2,750	134.8
Labour employed : Total . .	75,295	157,821	109.6
With mechanical power . .	37,706	72,930	93.4
Without „ „ . .	37,589	84,891	120.5
Establishments employing 400 persons and over : Total No.	1,236	1,406	13.7
With mechanical power . .	1,096	1,233	12.5
Without „ „ . .	140	173	23.4
Labour employed : Total . .	1,555,906	1,860,806	19.6
With mechanical power . .	1,454,690	1,739,405	19.6
Without „ „ . .	101,216	121,401	19.9

TABLE II—1921.

Establishments employing 20—50 Persons.

	With Mechanical Power	Number	Persons employed	
			Male	Female
I.	Growing of special products . .	117	3,298	663
II.	Mines . .	75	2,093	353
III.	Quarries of hard rocks . .	6	153	46
IV.	Textiles and connected industries . .	605	15,968	4,424
V.	Leather etc. industries . .	13	425	15
VI.	Wood etc. industries . .	111	3,560	189
VII.	Metal industries . .	156	5,001	64
VIII.	Glass & earthenware industries . .	35	994	206
IX.	Industries connected with chemical products . .	194	6,024	349
X.	Food industries . .	638	16,077	3,696
XI.	Industries of dress . .	9	273	1
XII.	Furniture industries . .	8	251	3
XIII.	Industries connected with building . .	26	736	98
XIV.	Construction of means of transport and communication . .	50	1,691	3
XV.	Production, application & transmission of physical forces . .	56	1,728	15
XVI.	Industries of luxury . .	146	4,529	4
	Total . .	2,245	62,801	10,129
	Without Mechanical Power			
I.	Growing of special products . .	277	6,199	2,883
II.	Mines . .	171	3,898	1,555
III.	Quarries of hard rocks . .	85	2,428	403
IV.	Textiles and connected industries . .	306	7,381	1,876
V.	Leather etc. industries . .	83	2,387	197
VI.	Wood etc. industries . .	74	2,162	35
VII.	Metal industries . .	154	4,230	78
VIII.	Glass and earthenware industries . .	350	9,329	1,690
IX.	Industries connected with chemical products . .	305	7,371	2,042
X.	Food industries . .	405	9,734	2,517
XI.	Industries of dress . .	98	2,463	129
XII.	Furniture industries . .	59	1,854	17
XIII.	Industries connected with building . .	108	3,025	736
XIV.	Construction of means of transport and communication . .	79	2,453	11
XV.	Production, application & transmission of physical forces . .	—	—	—
XVI.	Industries of luxury . .	196	5,757	51
	Total . .	2,750	70,671	14,220

TABLE II—1921 (*contd.*)

Establishments worked With Mechanical Power	Employing 10—20 persons			Employing 400 persons or more		
		Persons employed			Persons employed	
	Number	Male	Female	Number	Male	Female
I. . .	45	574	91	576	292,001	285,426
II. . .	24	307	63	130	120,405	39,148
III. . .	—	—	—	8	5,469	2,804
IV. . .	349	4,780	586	275	520,114	119,367
V. . .	1	11	4	4	2,292	304
VI. . .	33	476	4	9	5,879	39
VII. . .	68	1,011	17	62	108,443	8,228
VIII. . .	3	47	1	18	10,849	2,543
IX. . .	103	1,415	165	33	51,353	1,922
X. . .	598	7,724	1,329	23	16,171	1,846
XI. . .	4	53	2	3	2,668	—
XII. . .	4	56	—	1	527	—
XIII. . .	56	701	108	4	2,478	660
XIV. . .	14	201	8	58	116,869	1,333
XV. . .	11	178	1	9	5,516	358
XVI. . .	81	1,254	3	20	14,361	32
Total . .	1,394	18,788	2,382	1,233	1,275,395	464,010
Establishments worked Without Mechanical Power						
I. . .	188	2,240	638	107	37,334	32,078
II. . .	84	969	337	24	10,582	6,266
III. . .	76	995	101	6	3,883	1,100
IV. . .	522	6,236	1,329	6	2,155	3,415
V. . .	65	905	45	—	—	—
VI. . .	89	1,239	14	2	2,522	231
VII. . .	273	3,936	49	—	—	—
VIII. . .	257	3,435	474	9	4,127	1,666
IX. . .	361	6,369	926	6	5,121	4,069
X. . .	558	6,601	1,261	1	392	23
XI. . .	263	3,458	25	—	—	—
XII. . .	53	731	6	—	—	—
XIII. . .	78	1,065	152	5	1,832	752
XIV. . .	60	848	18	4	2,524	12
XV. . .	1	16	—	—	—	—
XVI. . .	315	4,484	14	3	1,297	—
Total . .	3,243	43,527	5,389	173	71,789	49,612

TABLE III—1911.

Establishments worked With Mechanical Power	Employing 10—50 persons			Employing 400 persons or more		
	Number	Persons employed		Number	Persons employed	
		Male	Female		Male	Female
I. . .	69	1,857	437	553	322,529	289,201
II. . .	41	1,105	383	131	119,552	40,651
III. . .	1	36	10	3	2,425	445
IV. . .	282	7,699	1,831	231	363,413	78,375
V. . .	5	152	25	2	2,232	14
VI. . .	35	1,233	73	7	5,677	.....
VII. . .	87	2,725	35	36	43,129	2,681
VIII. . .	10	325	24	11	5,285	1,285
IX. . .	147	4,465	191	13	21,573	844
X. . .	276	7,477	1,366	29	20,854	2,839
XI. . .	10	322	2	3	4,294	118
XII. . .	4	156	—	—	—	—
XIII. . .	45	1,059	183	8	5,190	1,093
XIV. . .	30	1,023	5	46	101,247	1,382
XV. . .	34	1,177	10	4	4,305	30
XVI. . .	73	2,310	10	19	13,995	32
Total . .	1,149	33,121	4,585	1,096	1,035,700	418,990
Establishments worked Without Mechanical Power						
I. . .	172	3,899	2,113	75	29,751	22,794
II. . .	55	1,308	565	12	5,739	3,609
III. . .	17	492	84	8	4,478	1,587
IV. . .	116	2,760	775	20	6,479	2,705
V. . .	63	1,925	139	—	—	—
VI. . .	25	749	8	5	10,163	26
VII. . .	82	2,140	15	2	1,007	1
VIII. . .	154	4,563	668	5	2,489	1,001
IX. . .	138	3,235	1,047	4	1,591	935
X. . .	108	2,597	640	1	993	836
XI. . .	48	1,559	19	1	557	1
XII. . .	22	687	13	—	—	—
XIII. . .	16	628	236	3	1,889	664
XIV. . .	39	1,216	2	2	1,080	—
XV. . .	3	94	1	—	—	—
XVI. . .	113	3,399	13	2	871	—
Total . .	1,171	31,251	6,338	140	67,057	34,159

TABLE IV.

Establishments worked With Mechanical Power.

		Number	Persons employed	
			Male	Female
I.	Growing of special products			
	1911 . .	991	367,742	318,697
	1921 . .	1,190	346,115	321,760
II.	Mines			
	1911 . .	373	144,773	50,955
	1921 . .	588	166,938	54,766
III.	Quarries of hard rocks			
	1911 . .	5	2,584	461
	1921 . .	24	6,433	3,347
IV.	Textiles and connected industries			
	1911 . .	1,265	429,739	107,457
	1921 . .	1,942	592,275	147,802
V.	Leather etc. industries			
	1911 . .	25	4,648	452
	1921 . .	45	6,071	589
VI.	Wood etc. industries			
	1911 . .	122	15,691	712
	1921 . .	247	22,413	953
VII.	Metal industries			
	1911 . .	257	67,048	2,997
	1921 . .	500	146,408	8,884
VIII.	Glass and earthenware industries			
	1911 . .	61	11,320	2,563
	1921 . .	143	21,703	5,256
IX.	Industries connected with chemical products			
	1911 . .	252	34,750	2,034
	1921 . .	450	66,354	3,958
X.	Food industries			
	1911 . .	557	52,154	6,903
	1921 . .	1,530	69,808	9,670
XI.	Industries of dress			
	1911 . .	18	5,177	185
	1921 . .	25	4,129	43
XII.	Furniture industries			
	1911 . .	14	1,571	36
	1921 . .	24	2,070	18
XIII.	Industries connected with building			
	1911 . .	90	10,448	2,530
	1921 . .	118	7,742	2,186
XIV.	Construction of means of transport and communication			
	1911 . .	163	117,351	1,528
	1921 . .	261	138,999	1,791
XV.	Production, application & transmission of physical forces			
	1911 . .	61	7,947	127
	1921 . .	149	14,767	473
XVI.	Industries of luxury			
	1911 . .	215	35,131	236
	1921 . .	406	40,714	190
	TOTAL . .			

TABLE IV (*contd.*)

Establishments worked Without Mechanical Power.

		Number	Persons employed	
			Male	Female
I.	Growing of special products			
	1911	696	73,058	50,910
	1921	1,076	88,900	64,083
II.	Mines			
	1911	189	17,446	10,915
	1921	447	30,049	14,990
III.	Quarries of hard rocks			
	1911	48	6,955	2,273
	1921	240	14,115	3,339
IV.	Textiles and connected industries			
	1911	222	15,618	5,075
	1921	947	23,744	0,244
V.	Leather etc. industries			
	1911	123	7,860	652
	1921	198	7,334	501
VI.	Wood etc. industries			
	1911	46	12,481	183
	1921	201	9,130	370
VII.	Metal industries			
	1911	115	6,828	186
	1921	483	13,946	455
VIII.	Glass and erthernware industries			
	1911	392	28,532	7,051
	1921	942	44,224	10,837
IX.	Industries connected with chemical products			
	1911	203	8,979	3,586
	1921	776	29,540	9,305
X.	Food industries			
	1911	163	12,050	3,294
	1921	1,077	23,845	6,545
XI.	Industries of dress			
	1911	72	4,640	187
	1921	382	7,548	298
XII.	Furniture industries			
	1911	36	1,751	14
	1921	133	4,548	34
XIII.	Industries connected with building			
	1911	73	6,567	2,623
	1921	299	14,951	4,819
XIV.	Construction of means of transport and communication			
	1911	79	6,169	69
	1921	210	14,313	180
XV.	Producation, application and transmission of physical forces			
	1911	3	94	1
	1921	1	16	—
XVI.	Industries of luxury			
	1911	174	10,048	39
	1921	552	15,172	115
	TOTAL			

VII.

THE MALTHUSIAN DOCTRINE AND OVER-POPULATION.

In book II, Chapter XIII of his *Essay on population* Malthus thus summed up his conclusions regarding the growth of numbers :—

" The increase of population is necessarily limited by the means of subsistence :

" Population invariably increases when the means of subsistence increase, unless prevented by powerful and obvious checks :

" These checks, and the checks which keep the population down to the level of the means of subsistence, are moral restraint, vice and misery."

The Malthusian doctrine and its critics.

This Natural Law of the growth of population, as Malthus regarded it, has not been universally accepted. Malthus' doctrine found many opponents in his own time, and in more recent times, that is, towards the close of the 19th and the beginning of the 20th century, Malthus has been severely criticised by economists of note in Germany and elsewhere. One of them, Dr. Franz Oppenheimer, goes so far as to say that Malthus' *Essay* is not a work of genuine scholarship, that there is in Malthus a complete lack of logical ability, and that it is almost a physical torment to wade through the *Essay* with its endless repetitions. etc.* He gives two reasons to explain the popularity of the Malthusian doctrine and the importance which it acquired. Firstly, the theory absolved the bourgeoisie from all blame for the crying misery of the working classes, and made a Natural Law responsible for it. Secondly, Malthus has been

* Das Bevölkerungsgesetz des T. R. Malthus und der neuren Nationalökonomie, by Dr. Franz Oppenheimer, p. 64.

misinterpreted, and the theory which is taught in his name in Germany is not altogether devoid of sense—it is an opponent worthy of Oppenheimer's steel, whom he proceeds to demolish.

Karl Marx preceded Oppenheimer in condemning the Natural Law of Malthus as a partisan doctrine. It suited the interests of the ruling classes whom Malthus glorifies, says Marx, to explain over-population as the result of the eternal laws of nature, rather than of the historic natural laws of capitalistic production.*

Supporters of Malthus.

On the other hand, the Malthusian doctrine has found many supporters in all countries, the most prominent among them being John Stuart Mill (1806-1873) in England, Say (1767-1832), Sismondis (1773-1842) and Quetelet (1796-1874) in France, and Rau (1792-1870) and Robert von Mohl (1799-1875) in Germany. As regards the influence of this theory it will be sufficient to say that the reformed English poor law of 1834 was the result of Malthus' teaching, and that in Germany, Austria and Switzerland legislation was enacted in the first half of the 19th century with the object of discouraging marriages among the working classes, permission to marry being given, as in Württemberg, only if it could be shown that the couple intending to marry possessed adequate means of subsistence.

Among more recent writers in Germany Gustav Rümelin, (1815-1889) Lorenz von Stein (1815-1890), Wilhelm-Roscher (1817-1894) and Wagner (1835-1917) support Malthus The future, says Roscher, will recognize in Malthus an economic investigator and discoverer of the foremost rank.

Dr. Marshall.

In England Dr. Marshall accepts the Natural Law of Malthus, and is willing to give him "a place among the founders of historical economics." He holds that the second and third steps of Mathus'

Das Kapital, p. 466 (Kautsky's edition of 1914).

argument, though " antiquated in form," " are still in a great measure valid in substance," and concludes:

" It remains true that unless the checks on the growth of population in force at the end of the 19th century are on the whole increased (they are certain to change their form in places that are yet imperfectly civilized) it will be impossible for the habits of comfort prevailing in Western Europe to spread themselves over the whole world and maintain themselves for many hundred years".

Assuming the population of the world to-day to be one and a half thousand millions and the rate of increase to be 8 per 1,000 annually, Dr. Marshall calculated that in less than 200 years the population of the world will amount to 6,000 millions. Allowing for improvements in the arts of agriculture, Dr. Marshall thought that " the pressure of population on the means of subsistence may be held in check for about 200 years but not longer."*

Similar calculations have been made by others. For example, Knibbs, Statistician of the Commonwealth of Australia, estimates that the growth of the population of the world will exhaust the food requirement in 450 years.†

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* Principles of Economics, p. 180.

† " It has been contended in reply to Malthus that experience has shown that food production will advance even more rapidly than the growth of population. It can do so for only a very limited time. The false inference has been drawn from this fact that therefore almost any population can be provided for. The point demands attention, for the argument is a plausible one. Notwithstanding that it is invalid, as can be easily shown.

If the earth's present pupulation be taken as low even as 1,500,000,000 persons (which is of course an under-estimate) and its land area, excluding the arctic and antarctic continents, be assumed to be, say, 33,000,000,000 acres ; and if further it is supposed that by some means it is possible to make the whole of this land area yield an average of as much as 22.8 bushels of food corn per acre per annum, the total yield would be only 752,400,000,000 bushels.

On the other hand, Hermann Losch thinks that, taking into consideration all factors which are known, it can be said witout exaggeration, from the technical point of view, that 7,000 millions could be supported with the means of subsistence which the land and the sea provide now. The fear of death by starvation on account of the insufficiency of the means of subsistence is, to-day, more groundless than ever before.*

Difficulty of estimating accurately world supply and world demand for food.

It will be seen that these writers, when they discuss the problem of over-population, have in mind, not the case of a particular country, but the possibility of growing pressure on the agricultural resources of the whole

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"In Australia, and in fact generally, the food corn consumption is, on the average, about equivalent to 5.7 bushels per annum, viz., one-fourth of the amount above assumed, which means that the total population which could be fed with 5.7 bushels of food corn per annum together with other foods in like proportion would be only 132,000,000,000. At a rate of increase of population of 0.01 per annum, somewhat less than the rate for all countries which have accurate statistics, it would require only 450 years to exhaust the food requirement mentioned (more exactly 449·96 years). That no possible increase of the earth's productiveness can materially affect the question can also be readily shown. For—to postulate the impossible—let it be supposed that every acre of area of the earth's entire surface can produce as much as 228 bushels, that is, ten times the above amount, with other foods in like proportion ; this being done, it would take less than 700 years (681.37 years) for the population to exhaust the food supply. The fundamental element in Malthus' contention is thus seen to be completely established. Even a low rate of increase must soon exhaust the possibilities of food supply. * * * It is quite clear, therefore, that statistical analyses of the world's progress in various ways will soon become of the highest order of importance." *Census of the Commonwealth of Australia* by Knibbs, 1917, pp. 454-55. Or see Mathematische Bevölkerungstheorie based on Knibbs' work by Czuber pp. 354—55.

*H. d. S. Band II p. 816.

world. To estimate accurately the rate of growth and the increase in food supply for the whole world is impossible. It is more or less juggling with figures, and for practical purposes the value of such calculations is little. No conclusion regarding the truth or falsity of the Malthusian principle can be reached if the discussion is limited to facts which cannot be definitely ascertained and which are, at best, conjectures. It will be more interesting if we examine the case of particular countries with a view to determining how far " countries are populous according to the quantity of human food which they produce or can acquire."

Rapid growth of numbers in the leading European countries

Malthus thought that Europe was over-populated. But between 1800 and 1910 the population of Europe increased from 187,363,000 to 447,477,000 or 138.8 per cent., of Germany by 165 per cent., and of England and Wales by no less than 290 per cent.—in other words, Europe supports a population which is somewhat less than 2½ times greater than that in 1800, Germany more than 2½ times, and England and Wales support a population which is actually about four times greater. The population of Europe has been growing at the annual rate per 1,000 of 7.9; Germany 8.9 and England and Wales 12.3.

accompanied by a decrease in the numbers dependent upon agriculture.

The growth of numbers in England and Wales and Germany has been accompanied by an absolute decrease in the numbers dependent upon agriculture, but thanks to the development of the facilities of communication and transportation, these countries have had no difficulty in providing themselves with food. With their expanding needs they have been able to " acquire " more food—, but the acquisition of more food is not of any significance in explaining the rate of growth of population in England and Wales or in Germany. They are able to support a greater population on account of their greater wealth and income, which have

increased in a proportion much greater than the population. The growth of industries and trade has been at the expense of agriculture, but the increase in productive powers, owing to the invention of new methods and the improvement of old methods of manufacture, has augmented national income, so that the whole population, including the agricultural community, is now maintained at a higher level of comfort than before. So long as progress and invention continue, reducing the real cost of production and enhancing national income, the inhabitants of the industrial countries of Europe can go on multiplying without fear of starvation. Of course, theoretically speaking, a limit to the growth of numbers must exist somewhere, but it is determined by progress. When progress ceases population will and must cease to grow. But no bounds can be set to the resources of science and the ingenuity of the human mind.

Growth of manufactures and increase in national wealth and income.

It will thus appear that the growth of population in the leading industrial countries of Europe has not been determined by considerations of food supply—the chief determining factor has been the growth of manufactures, and the consequent increase in national wealth and income. Malthus wrote at a time when England was in the throes of the industrial revolution, and the rest of Europe was in the agricultural stage. His review of the economic condition of Europe and of the causes which operated to check the growth of numbers in the 17th and 18th centuries has now only a historic interest. Those conditions no longer exist in Europe. The increasing density of population, which was Malthus' nightmare, is of advantage to-day. In the famine of 1871-72, 150,000 persons died of starvation in the Electorate of Saxony, and 180,000 in Bohemia. This is impossible to-day for the whole of Germany is covered by a net-work of good roads, canals and railways, which would immediately bring food to any part of

the country where there was shortage, and food can also be imported from abroad. The important question in this connection is whether a country, which does not grow sufficient food, is able to pay for imported food, and a nation with a well-developed system of manufacture is at no disadvantage whatsoever in the matter of provision of food for its growing population as compared with an agricultural country. The success in fighting disease and the phenomenal decrease in the ratio of deaths per 1,000 from various diseases again bear evidence to improvement in the ecomonic environment. Malthus' Natural Law of population, according to which the increase of population is limited by the means of subsistence, is not merely antiquated in form, but is of no help at all in explaining the movement of the population in the progressive industrial countries of the West.

What is the position in India ?

Reference to India in Malthus' Essay.

Malthus' references to India form some very interesting reading. Evidently Malthus had no direct knowledge of India, his information about customs relating to marriage in India being derived from Sir William Jones' translation of Manu's *Dharm Shastra*. He refers to the strict precepts relating to the government of the passions in Manu, and among the preventive checks to population in India he mentions the division of the people into classes or castes, and the difficulty of changing the traditional occupation of the caste; the custom that the elder brother must marry before younger brothers are allowed to marry, and the difficulty with which the choice of a wife was attended, considering that, according to Manu, girls with too little or too much hair, who are too talkative, who have bad eyes, a disagreeable name or any kind of sickness, who have no brother or whose father is not well known, and many others were to be avoided. Malthus concluded that the preventive check was not absent in India. But he noted that early marriage

was the rule in India, which led every person to marry "who could look forward to the slightest chance of being able to maintain a family." "The natural consequence of this was," he continues, "that the lower classes of people were reduced to extreme poverty, and were compelled to adopt the most frugal and scanty mode of subsistence. . . . The population would thus be pressed hard against the limits of the means of subsistence, and the food of the country would be meted out to the major part of the people in the smallest shares that could support life."*

In such a state of things the population would suffer terribly in seasons of scarcity of food, and in epidemics which Malthus regarded as "the consequences of indigence and bad nourishment." The positive checks to population would chiefly affect the lowest class.

There is no reference in the *Essay* to an important preventive check among the Hindus, the prejudice against widow remarriage.

A preventive check among the Hindus.

The proportion of Hindu widows of all ages is 1,914 per 10,000 females, against 1,455 Muslim, 1,125 Christian, 1,250 Tribal and 1,149 Buddhist widows. The prejudice against widow remarriage is one of the causes of the slower rate of growth of the Hindus as compared with that of the Muhammadans. It is, of course, unjust that restrictions should be imposed upon a helpless and unfortunate section of the community while others may marry as often as they please, but it cannot be denied that the prejudice against widow remarriage has acted as some kind of preventive check to the growth of numbers among the Hindus.

Over-population as the cause of famine and disease.

Malthus regarded over-population as the cause of famine as well as disease. He admitted that the principle of population could not absolutely produce a famine, but "it prepares the way

* *Essay*, p. 108 (Bettany's Edition published in 1880).

for one, and by frequently obliging the lower classes of people to subsist nearly on the smallest quantity of food that will support life, turns even a slight deficiency from the failures of the seasons into a severe dearth; and may be fairly said to be one of the principal causes of famine."† As regards disease, he pointed out that the principal victims were always the lower classes, who were badly nourished and who lived crowded together in small and dirty houses. "In what other manner", he asked, "can Nature point out to us that if we increase too fast for the means of subsistence so as to render it necessary for a considerable part of society to live in this miserable manner, we have offended against one of her laws ?"‡

The main facts regarding the population of India may be summarized as follows:

On account of the universality of marriage, the early age of marriage and the absence of preventive checks (with the exception of the prejudice against the remarriage of widows) the population of India tends to increase rapidly. India has the highest birth rate in the world.

But India has also the highest death rate in the world. The actual rate of growth of the population of India is less than that of any European country with the exception of France.

The movement of the population is irregular, periods of a rapid increase being followed by periods in which the population is almost stationary, or increases very slightly.

Famine and disease acted as positive checks to population in the past. Famine no longer causes death by starvation, but it lowers the vitality of the people, and they become peculiarly liable to the attacks of certain epidemics. At the present time the population of India is controlled by disease.

† *Essay* p. 290.
‡ Ibid p. 442.

The influenza epidemic in the last decade claimed more victims in India than the war in Europe.

The ratio of deaths from all causes in each thousand of the population in 1916-20 (38.19) was higher than in 1901-05 (33.04). The ratio of deaths by cholera, fevers, and respiratory diseases was higher in 1916-20 than in 1901-05. While in European countries both birth rates and death rates show a tendeney to fall, in India they show no such tendency. The birth rate rose from 35.83 to 38.18 and the death rate from 27.44 to 33.94 between 1885-90 and 1901-1910. The fall in the birth rate and the rise in the death rate in 1911-20 (36.93 and 34.13 respectively) were due to the influenza epidemic.

A comparative study of the age-distribution of the population shows that India has the largest number (per 1000) of children under 10 and the smallest number of persons above the age of 50. The difference between the ratio of persons under 10 and that of persons between 10 and 20 is greater in the case of India than in any European country.

Infant mortality in India is the highest among the leading countries of the world. Further, while infant mortality has decreased in European countries during the past 50 years, it shows no signs of decreasing in India. The highest as well as the lowest ratios of deaths of infants in each thousand of the population were higher in all the provinces in the decade 1901-10 than those of the preceding decade.

In marked contrast to European countries there is an excess of males over females in India. In the case of all provinces without exception there has been a fall in the proportion of females during 1901-1921.

Not only is the duration of life shorter in India than in European countries but, in contrast to European countries,

where the mean after-life time at certain ages has increased, in India it was less for all ages in 1911 than in 1891, and in view of the unhealthiness of the last decade, it is probable that it was still less in 1921.

Being in possession of these facts, the accuracy of which cannot be questioned, we proceed to inquire whether the Malthusian principle is at work in India.

Positive checks to population working in India.

Now any careful student of Malthus who considered the facts stated above—the irregular movement of the population, the influence of disease, the high birth and death rates, the rate of infant mortality, the age-constitution of the people, the fall in the proportion of females and the shortening of the mean after-life time at certain ages—would come to the conclusion that the positive checks to population were working in India in order to adjust the growth of the population to the limits of subsistence, disease being the principal instrument of such adjustment.

Has the population of India out-grown the supply of food ?

This belief is held by many persons in India.* The subject is full of difficulties, for accurate and reliable data, on the basis of which an answer to the question might be attempted, do not exist.

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* For example, Wattal in his interesting treatment of the population problem arrives at the conclusion that the population has increased faster than the area under cultivation, and quotes the index numbers of the Prices Enquiry Committee which compare the growth of population with the area under cultivation in confirmation of his view. He recommends our cultivating "the habit of cutting our coat according to the cloth as much in the matter of progeny as in every other concern of life", for the neglect of this principle means that "the hand of death" will "limit the population to the means of subsistence."

Similarly Dr. P. P. Pillai in a suggestive article in the Indian Review (August 1924) compares the production of

Population and food supply. Estimates of yield.

The Government of India in reviewing the report of the Prices Enquiry Committee pointed out the difficulties in estimating the total outturn of agricultural produce. For large parts of the country no statistics of either the area under cultivation or the area under food-grains are available. Further, the normal yields per acre are "notoriously untrustworthy" and the percentage of the yearly outturn to the normal is based on district returns "which are little more than loose conjectures". It is evident that until we have more reliable estimates of yield of food-crops it will be impossible to say whether the population of India has been growing more rapidly than the means of subsistence. The figures which led the Government of India to the conclusion that there was "an almost precise parallelism between the growth of population and extension of food cultivation" are re-produced below, but they are admittedly incomplete:

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food-grains with the growth of population over a long period, and reaches the conclusion that "the general food position of the country has tended to remain the same and has been unable to show any improvement on 1880." He thinks that "the food supply has remained fairly constant," and "The non-expansion of the food supply keeps the ordinary margin of subsistence narrower in India than in any other country and leaves it exposed to the dangers" which many writers have described.

Table showing acreage under cultivation and growth of population.

	Quinquennial averages				Average of
	1890-91 to 1894-95	1895-96 to 1899-00	1900-01 to 1904-05	1905-06 to 1909-10	1910-11 to 1911-12
Area under cultivation in thousands of acres ..	123,480	115,352	126,217	130,253	132,018
Index number ..	100	93.4	102.2	105.5	106.9
Population in thousands ..	99,649	100,029	101,008	102,383	103,018
Index Number ..	100	100.4	101.4	102.7	103.4

Table comparing the growth of population with the area under food grains

	Quinquennial averages				Average of
	1890-91 to 1894-95	1895-96 to 1899-00	1900-01 to 1904-05	1905-06 to 1909-10	1910-11 to 1911-12
Area in thousands of acres	101,121	93,978	101,213	103,055	103,332
Index Number ..	100	92.9	100.1	101.9	102.2
Population in thousands ..	99,649	100,029	101,008	102,383	103,018
Index number ..	100	100.4	101.4	102.7	103.4

Increase in irrigated area.

What is certain is the very considerable increase in the irrigated area. The area annually irrigated increased from 10½ million acres in 1878-79 to 19¼ million acres at the beginning of the century and to 28 million acres in 1919-20. Between 1911-12 and 1920-21 the total irrigated area increased from 40,679,000 acres to 48,957,000 acres. In the Punjab the Triple Canal Project commands an area of 3,997,000 acres and already in 1919-20, 1,711,000 acres were irrigated by the project. 1,570,000 acres of the total area commanded by the triple canals system was classed as Crown Waste. Another great project in the Punjab, the Lower Jhelum Canal, commands a gross area of about 1½ million acres of which 1,160,000

acres are cultivable. Of this total 568,000 acres were classed as Crown Waste. Among the works under construction the Sutluj Valley Project will irrigate an area of 5,108,000 acres, of which 2,075,000 acres will be perennial and 3,033,000 acres non-perennial irrigation.* The largest project, that of the Sukhur Barrage and Canals in Sind, will command an area of 7½ million acres, of which 6½ million acres are cultivable.

There are numerous other projects, large and small, some of which have been sanctioned and are under construction, while others are awaiting sanction, which, when completed, will add to the irrigated area. It is confidently expected that a gross total of some 40 million acres will be irrigated from Government works in the near future in comparison with 28 million acres at the present time.

Increase in area under food-grains.

The total area under food grains in British India was 172,196,000 acres in 1891-92, 183,713,000 acres in 1902-03 and 204,791,000 acres in 1921-22, the increase in the area during the past thirty years being about 19 per cent. According to the latest available statistics the total area under food-grains in the Indian States was 41,613,000 acres in 1920-21. Complete figures for all States for earlier years are not available.

Between 1891 and 1921 the population of India increased from 287,314,000 to 318,942,000, but of the total increase 4.8 millions was due to inclusion of new areas and improvement of method. The real increase of population was 9.3 per cent. in thirty years. It is evident that the area under food grains has more than kept pace with the growth of population†.

* 1,942,000 acres will be in British territorry,2,825,000 acres in Bhawalpur, and 341,000 acres in Bikaner.

† It may be objected that the area under food-grains in British India has been compared with the growth of population in the whole of India (including States). This has been done because it is difficult to estimate the real increase of population separately for British India and Indian States.

In view of what has been said above about the estimates of outturn, it would be of little use to compare the production of food-grains at the present time with that of thirty years ago. But we may still consider whether there is any lack of food in India, and whether the growth of population in the future is likely to be hindered by inelasticity of food supply.

Estimates of food-grain production and consumption.

The Famine Commission of 1880 estimated the annual food-grain production in British India (excluding Burma, but including Mysore which was then under British rule) at 51,530,000 tons, and the annual food requirement, including seed, cattle-food and wastage, at 47,165,000 tons. There was thus a surplus of 5,165,000 tons (including a surplus of 800,000 tons in Burma) available for export or for storage. The Famine Commission of 1898 thus estimated the production and consumption of food-grains :—

Population	215.6	millions.
Food-crop area	180.4	million acres.
Outturn of food	68.06	million tons.
Ordinary Consumption:		
Food	48.06	million tons.
Seed	4.22	,,
Cattle-food	3.20	,,
Wastage	3.05	,,
Total ordinary consumption	58.53	,,
Surplus	9.53	,,

However, if we take British India only, the population increased from 220,879,000 in 1891 to 247,003,000 in 192I, the increase per cent. being 11·8, which is less than the increase in the area under food-grains.

It may also be objected that the growth of population in 1921 has been compared with the area of 1921-22—in 1920-21 the total area under food-grains was 186,890,000 and in 1918-19 only 177,843,000. The year 1921-22 has been chosen for comparison as it was a normal year; production in 1918-19 and 1920-21 was much below the normal. In 1916-17 and 1917-18 the area under food-grains exceeded 207 million acres.

Seed represented 6.2 per cent. of the total outturn of food, cattle-food 4.7 per cent. and wastage 4.5 per cent.

The production of food-grains at the present time may be estimated as follows:*

	Area in acres	Yield in tons
Rice	81,961,000	33,468,000
Wheat	30,844,000	9,888,000
Barley	7,350,000	3,117,000
Jwar	31,556,000	6,157,000
Bajra	13,939,000	2,420,000
Maize	5,908,000	1,902,000
Gram	16,395,000	5,205,000
Ragi	6,661,000	2,094,000
Other food-grains and pulses	34,693,000	20,461,000
Total	229,307,000	84,712.000

The total outturn of food is thus 84.7 million tons. Ordinary consumption may be estimated as follows :—

Population.	319	Millions.
Food	63.8	Million tons
Seed	5.9	,,
Cattle-food	4.2	,,
Wastage	4.2	,,
Total ordinary consumption . .	78.1	,,
Surplus	6.6	,,

* Actual production in 1922-23, excepting Ragi and Other Food-grains and Pulses (see *Estimates of Area and Yield of Principal Crops in India*, 1922-23. The area under Ragi in 1920-21 (later figures not available at the time of writing) in India was 6,661,000 acres and under Other Food grains and Pulses 34,693,000 acres. Mr. Datta estimated the yield of 4,982,000 acres under Ragi in 1911-12 to be 42,895,000 maunds; and of 28,584,000 acres under Other Food-grains and Pulses to be 459,435,000 maunds. The probable yield of Ragi in 1920-21 on this basis will be 57 million maunds (=2,094,000 tons; 1 maund=82.286 lbs.), and of Other Food grains and Pulses 557 million maunds (= 20,461,000 tons.)

Seed requirement is taken to be 7 per cent. of the out-turn, cattle-food 5 per cent. and wastage also 5 per cent. As regards human food, it has been assumed that a ton of food, on an average, will feed five persons for a year.*

India self-dependent in the matter of food-supply.

These figures are not exact, but they show that India produces enough food for her own population. The margin for export is very little in ordinary years, and there is no exportable "surplus" at all in years of scarcity, but considering the steady rate of expansion of the area under food-grains and the present production it cannot be said that there is any lack of food in India.

The self-sufficiency of India (including Burma) in the matter of food is shown by the fact that India practically does not import food. India is not cut off from the rest of the world, and if there was any real scarcity of food in the country, food would be imported.

Further, our estimates of production do not take into account the total area under food-grains. There is some area in Indian States whose yield is not included in the estimates of area and yield published by the Government. This is well brought out by the following table showing the area under food-grains for which estimates of yield were available in 1920-21 and the total area under food-grains in British India and Indian States, as given in *The Agricultural Statistics of India*, Vols. I and II.

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* The allowance for children under 5 and for persons of 70 and over will be less than for grown-up persons. One ton for five persons for a year means a daily allowance of 1.23 lbs. per head. If a family consisted of three grown-up persons, one infant or child and one old man, or two children, then the three could consume 4.5 lbs. daily, leaving 1.65 lbs. for the other two.

	Total area. Acres.	Area for which estimates of yield were available.
Rice . .	81,619,000	78,952,000
Wheat . .	25,107,000	. . 25,784,000
Barley . .	7,127,000	. . 6,203,000
Jwar . .	37,438,000	. . 22,662,000
Bajra . .	17,296,000	. . 11,991,000
Maize . .	8,106,000	. . 6,164,000
Gram . .	12,510,000	. . 9,205,000
Total . .	189,203,000	160,961,000

The area under wheat in column 3 is actually larger than the corresponding total area in British India and Indian States. This must be due to the inclusion, in preparing estimates, of areas which are not shown in *The Agricultural Statistics*.* But in the case of other food-grains the area for which estimates of outturn are not available is appreciable, the total amounting to 28 million acres.

As regards the future we cannot exclude the possibility of an increase in the yield per acre if the methods of cultivation are improved. The yield per acre in different provinces is not the same, and it is much less than the yield per acre in foreign countries.†

Substitution of non-food crops for food-crops.

It is sometimes said that on account of the rise in the prices of non-food crops there has been, in some parts of India, a substitution of non-food crops for food-crops, and a shortage of food supply in consequence. Mr. Datta found that "the area

*The estimated yield of 29,949,000 acres under wheat in 1919-20 is given in *The Estimates of Area and yield of Principal Crops in India*, while according to *Agricultural Statistics* the area under wheat in British India in 1919-20 was 23,530,000 acres, and Indian States 5,302,000 acres—a total of 28,832,000 acres.

† See *The Agricultural Statistics of India*, (1921-22), Vol. I, pp. 66—67.

under food grains has actually contracted in some circles, while in some others its growth has been retarded and the net result has been a diminution of the food supply of the country and consequent rise in prices.'' This view was not accepted by the Government of India. It is certainly true that the area under non-food crops has been expanding rapidly. Between 1902-03 and 1921-22, the area under non-food crops increased from 34,930,000 acres to 40,731,000 acres, or 16.6 per cent. while the area under food-crops (food-grains *plus* sugar and other food-crops) increased from 192,519,000 acres to 215,508,000 acres, or by 11.9 per cent. But of the total area under food and non-food crops, 84.6 per cent. was under food-crops in 1902-03 and 84.1 per cent. in 1921-22. The decrease in the proportion is too slight to be of any great significance, and we may be certain that if food supply began to contract on account of this substitution, the rise in the price of food would soon restore the balance.

The rise of prices is no proof of shortage in the supply.

The rise in the price of food-grains is no proof of any shortage in the supply. We have seen that such estimates of outturn as are available give no indication of shortage. Mr. Datta himself was unable to explain the rise in the price of food-grains in years of plentiful harvests. It may be said that up to the year 1905 prices fluctuated according to the seasons. A new era in the history of Indian prices began in that year. Mr. Datta refers to the failure of spring crops of 1905-06 in Bombay, and the floods in North Behar in 1906-07 which damaged the crops. "Taking India however, as a whole,'' he proceeds, "the agricultural conditions were not seriously adverse either in 1905 or in 1906. Still these years appeared to have ushered in a new period in the history of Indian price levels, the predominant characteristic of which was the existence of famine prices without famine.*'' The explanation of famine prices without famine

*Prices Report p. 32.

does not lie in the shortage of supply, but in an independent group of circumstances connected with the supply of money. It may also be pointed out that it was not merely food prices that were rising before the war, but all prices. The different classes of commodities the prices of which rose in the quinquennium 1908-12 are arranged below in descending order of increase :

Hides and skins	159
Oil seeds and oils	145
Food-grains—pulses	143
„ „ cereals	142
Building materials	133
Cotton	131
Jute	129
Other articles of food . .	
Other raw and manufactured articles	126
Metals	120
Sugar	109

Inflation as the cause of the general rise of prices.

During the war prices rose further. As compared with the pre-war year 1913 the general price level about doubled. But, as is well known, the prices of imports and manufactured goods rose to a greater extent than the price of food. Except in 1918-19 there was never at any time during the war any shortage in the supply of food. Record quantities of rice and wheat were produced in 1916-17 and 1917-18, the increase in production in later years, as compared with 1913-14, being 22 per cent. for rice, and 26 per cent. for wheat ; there was also a considerable increase in the production of other food-grains. Production was much below the normal in 1920-21, but in 1921-22 and 1922-23 the yield of the principal crops was greater than in the pre-war year 1913-14. The general price level in October 1924 was 81 per cent. higher than the

average of July 1914 (=100), the index number of food articles stood at 170, of non-food at 186. Shortage of supply does not explain the rise of prices, considering, in the first place, that there is no evidence of shortage of food, except in years of scarcity; and secondly, that the prices of non-food articles to-day stand at a higher level than of food articles. There is more money in circulation, and we all buy and sell both food and non-food articles at a higher price level.

The view that India does not grow enough food for her population, and that the shortage of food restricts the growth of numbers, must be dismissed as untenable.

But we have still to find an explanation for the peculiar movement of the Indian population—periods of rapid growth being followed by periods in which the population remains practically stationary, and for the slower rate of increase of population in normal years than in Western countries.

This explanation lies in the poverty of the people, their lower standard of living and their general resourcelessness.

The connection between poverty and disease.

There is certainly a connection between poverty and disease, as pointed out and emphasized by Malthus. The influenza epidemic has been described as a fortuitous infection which spread over the whole world—it was not a direct consequence of proverty in India. But why was the ratio of deaths by influenza highest in India? How do we account for the fact that while the ratio of deaths by various diseases has gone down in European countries, it shows no signs of decreasing in India? What are the causes of the "extravagant reaction to conditions of public health" in India? Plagues, pestilences and famines are "terrible correctives of the redundance of mankind", and their prevalence in India would show that the population tends to become redundant.

Not because of any inelasticity of food supply, but because of the low average income per head of the population. It is an irony of fate that a country which produces enough food for her population and also exports it, should be unable to bear the same rate of increase of population as the food importing countries of the world.

The view of the Census Commissioner, 1921.

The Census Commissioner for India (1921) does not admit that there is a connection between the prevalence of disease in India and the economic circumstances of the people. The annual fluctuations of the birth and death rate, in his view, are "probably much more dependent on the intensity of the onslaught of the principal diseases, due to conditions of climate and environment, than on any supposed variation in the resisting power to them of the people owing to economic circumstances."* Climate and sanitary conditions would to some extent account for the high death rate but not for the *increase* in mortality from disease. Climate is a constant factor; sanitation, during the past 50 years, has certainly become better, not worse, though still much remains to be done. To hold climate and sanitation wholly responsible for the high death rate is to refuse to face the facts. In this connection we may quote the remarks of Mr. G. F. Hardy, who wrote the actuarial report on the census of 1881. He was struck by the large proportion of children, and the small number of old persons in India. That pointed to a high death rate and a low rate of increase per annum—"about one-fourth less than the English rate of increase." "Hence, a merely general view of the age tables demonstrates the fact," said Mr. Hardy, "that the death rate in India is considerably higher than in England, and consequently, that the average duration of life must be shorter, conclusions which are confirmed by the more detailed examination to which the materials available have been subjected."†

† Census of 1881, Report, p. 172. * Report, p. 55.

Actuarial report on the census of 1881.

He did not regard the higher death rate to be "entirely the effect of periodical visitations of famine and epidemic," as in years which were entirely free from these scourges the rate still remained very much higher than the average rate in England. He thought that a large part of the additional mortality was the effect of climate and the general sanitary conditions of the country. "On the other hand, however," he said, "it is not at all improbable that it is partly caused by a deficiency of stamina in the native races as compared with the English. Not only are vast numbers of the poorer classes unfed, but they are descended from generations subject to the same disadvantage, and thus inherit constitutions less robust from the first than those of European races, and at the same time having, unfortunately, to contend against greater odds in the struggle for existence."*

It would of course be difficult to trace a connection between the increase in the death rate in any year and the economic conditions of that or the preceding year. The influenza epidemic, indeed, came at a time of wide-spread crop failures, but the two preceding years were years of bumper crops. No epidemic is directly caused by crop failures, or poverty, but when an epidemic does come, the economic circumstances of the people have some share in determining their reaction to it.

Summary and conclusion.

We have seen that the growth of population in Europe, and particularly in England and Germany, has not been determined by the amount of food which Europe or these countries have been able to produce or acquire. We have seen that the chief factor of importance in this connection is increase in national wealth and income consequent upon the growth of manufactures, which has enabled the industrial countries of the West to

* Census of 1881, Report, p. 172.

buy whatever food they require in excess of their own production from foreign countries, and to maintain a rapidly increasing population at a higher level of comfort than a hundred years ago. We have also seen that shortage of food did not hinder the growth of the population of India in the past, nor is it likely to be the case for the next 50 years at least. The Malthusian theory is perhaps of significance if we take the whole world into view and consider the possibility of the world food supply giving out at some remote date in the future which cannot be precisely determined. But so far as any particular country is concerned, under existing conditions, the fear of starvation, or the growth of population being restricted by inability to procure food either by home production or imports, is groundless, provided national income and national wealth keep pace with the growth of population. We may therefore formulate our conclusion as regards the causes of increase or decrease in population in the following words :—

The growth of population, in general, ultimately depends on economic conditions, and the rate of growth adjusts itself to the growth of national income and national wealth.

This view is based on facts relating to India as well as European countries, and is valid for the industrial West as well as the agricultural East.

The prosperity of an individual, in the material sense, does not depend merely upon the food that he eats (except in a primitive stage of culture) but upon the totality of circumstances which go to make life comfortable. A nation is composed of individuals, and what is true in the case of the individual is true in the case of a nation—that its total income and wealth, of which food is only one item, determine the level of its prosperity, and its rate of growth. This conception raises man above the level of the mere animal. There is undoubtedly a struggle for existence among human beings, but it is on a higher plane than the struggle for existence among the lower animals.

We are now in a position to define over-population, and to answer the question whether India is over-populated

Is India over-populated?

The question of over-population has no reference to density per square mile. As compared with 177 persons per square mile in India there are 666 in Belgium, 650 in England and Wales, 513 in the Netherlands and 332 in Germany. No one for a moment thinks that these countries are over-populated. If our view that the growth of population ultimately depends upon economic conditions is correct, then over-population must mean the tendency of the population to increase faster than national income and wealth, and a fall in the standard of living must be the inevitable sign of over-population. Further, the question of over-population, as defined above, may be discussed in relation to particular classes of the community, for the fall in the standard of living may affect the lowest and the poorest class while the upper classes may be better off than before. It is thus seen that the question involves an examination not only of the amount of national income and wealth but its distribution.

India is not over-populated in the *absolute sense of the term*—that is, we have not arrived at the stage where there is no hope of any further increase in national income and the population must, therefore, cease to expand. We have not exhausted the possibilities of agricultural and industrial development; far from that—we are standing on the threshold of great possibilities. But India is over-populated in the sense that our methods of production and distribution of wealth remaining the same, the population cannot be expected to increase more rapidly than it has done in the past. One may safely say that if the land system of the country remains unchanged, and if we do not learn to create new sources of wealth by manufacture, the movement of the population during the next 50 years would be irregular, disease cutting short the growth of numbers whenever the population tended to grow too rapidly.

VIII.

OVER-POPULATION (contd.)

While India is not over-populated in the absolute sense, it cannot be denied that pressure on resources is beginning to be felt in many parts of the country. We have seen that over-population is a relative term. It has no reference to density per square mile, but to national income and wealth. The facts relating to the growth of population discussed in the preceding Chapters would show that, under existing conditions, India is over-populated. By this we mean that in particular parts of the country the population has tended to increase more rapidly than income, with the inevitable consequence that the growth of numbers has been cut short by disease. For the country as a whole it may be said that, under existing conditions, the rate of growth of national income and wealth does not favour a rapid increase of numbers.

We now proceed to examine the economic conditions of various parts of the country with a view to determining the extent of the pressure of the population on existing resources.

The Punjab.

The law of diminishing return probably working in sub-montane districts.

The most densely populated parts of the Punjab are those which lie in or alongside the sub-montane tract. They comprise the districts and States of Amritsar, Jullunder, Sialkot, Malerkotla, Kapurthala, Gurdaspur, Simla, Lahore and Hoshiarpur. Lahore lies further from the hills, but density in the Lahore district is heavy on account of the inclusion of the large urban area. These districts include some of the most fertile parts of the Province. They are regions of

comparatively heavy rainfall, and the level of sub-soil water is high. They are thus capable of supporting a heavy population. Other districts of the Province with a heavy density, with the exception of Lyallpur, lie in the remainder of the sub-montane tract and in the south-east corner of the Province. "Taking the whole strip of sub-montane country from Ambala to Rawalpindi", says the Census Superintendent for the Punjab, "it would appear that density is directly dependent on agricultural conditions; so closely dependent in fact that it seems probable that the law of diminishing returns has come into operation."†

Density varies according to agricultural conditions in the Western Plain.

Density of the rural population varies according to agricultural conditions in the Western Plain of the Punjab also, though, there are very little differences as regards soil and climate between the districts which lie in the Western Plain. Density varies enormously; at the one end we have Lyallpur (289) and at the other end Dera Ghazi Khan (56) and Bhawalpur (50). The districts with the greatest density are those which are copiously irrigated and colonised by Government agency. The population of these districts is increasing rapidly, and has not yet reached an equilibrium. The districts at the other end consist of dry plains where cultivation in some parts is possible only with inundation or laborious well-irrigation. The population in these districts, says the Census Superintendent, "may be near the maximum that the present age can support, but the advent of canal irrigation would immediately alter the position." How rapidly and effectively the position is altered by canal irrigation is shown by the case of Lyallpur, the population of which has increased, between 1881 and 1921, by no less than 2,314 per cent.

† Report, 1921, p. 29.

The Census Superintendent thus sums up his conclusions regarding the pressure of the population on agricultural resources:—

"To sum up, density varies everywhere in accordance with agricultural resources to the exclusion of all other factors; it is so directly proportionate that the conclusion that there is pressure on these resources is irresistible; yet this same direct proportion also indicates that other factors have not yet been brought into play and hence that the pressure on resources is not extreme, for in that case industrialism would have been forced into existence, and would have led to variations in density independent of agriculture. An exception to the rule exists in the irrigated portions of the Western Plain, where population is rapidly increasing and as yet has received no check by its pressure on resources; whilst the beginnings of more acute pressure are observable in the extreme east of the Province, where there is a steady decline in population in Ambala and Gurgaon, and a diminishing rate of increase in other districts."†

Over-crowded districts.

The extent of over-crowding in some of the districts of the Eastern Plain may be judged from the fact that between 1881 and 1921 the population of Ambala decreased 18 per cent., of Gurgaon 10.5 per cent., Ludhiana 8.3 per cent. and Karnal 3.2 per cent. The decrease in the population of Gurgaon and Ambala is not wholly accounted for by migration. The pressure on resources is heaviest in Gurgaon and it is not less severe in Ambala and Karnal.

The extent of the pressure on agricultural resources in different parts of the province may be judged by the incidence of the rural population per square mile on the net cultivated area of 1921 :—

† Report, p. 31.

Less than 200	200-399	400-499	500-599	600-899	900-1000
Hissar	Ferozpur Attock Mianwali Shahpur Rohtak	Gurgaon Lyallpur Montgomary Multan Jehlum Gujranwala Ludhiana Lahore Jhang Karnal Dehra Ghazi Khan Sheikhupura	Ambala Delhi Gujrat Muzzaffargarh Rawalpindi	Gurdaspur Amritsar Sialkot Jullundur Hoshiarpur	Simla Kangra

The incidence of the population on the net cultivated area is heavy in Simla and Kangra. The rural population in these districts as also (though in a less degree) in Hoshiarpur (831), is not wholly dependent on local agriculture. A large proportion of the inhabitants of Simla supplement their earnings by supplying transport. Hoshiarpur and Kangra send out domestic servants to all parts of the province, and also supply a large number of recruits for the army.

Pressure on resources in Gurdaspur, Amritsar, Jullundur, Sialkot and Gujrat.

The incidence of the rural population on the net cultivated area is determined by a number of factors (quality of the soil, rainfall and irrigation) which have varying degrees of importance in different parts of the Province. For example, the expansion of the population in Ferozpur and Hissar is limited by the poor quality of the soil. The districts which can bear an increase in numbers are Lyallpur, Shahpur, Muzzaffargarh, Multan and Jhang; these are the districts where irrigation is an important factor in determining density. There is pressure on resources in Gurdaspur, Amritsar, Jullunder and Sialkot, indicated by the fact that their population has remained stationary for over 40 years, and that the number of emigrants exceeds that of immigrants. These four districts, however,

are situated in fertile tracts of the Province. Gujrat, says the Census Superintendent, "has become dangerously congested" (incidence on net cultivated area 559; on average area of matured crops 664) but the opening of the Upper Jhelum Canal may save the situation.

On the whole it may be concluded that the growth of numbers in the Punjab will in future depend upon the extension of irrigation facilities, and will be confined to the irrigated tracts.

The United Provinces.

Exceptional conditions in the United Provinces.

Between 1881 and 1921 the population of the Punjab increased by 20.7 per cent., and during the last decade, 1911 to 1921, by 5.5 per cent. The population of the United Provinces increased by 9.1 per cent. between 1872 and 1921, and it decreased 3.1 per cent. in the last decade. Conditions seem to be exceptional in the United Provinces, for among the major provinces of India, the rate of growth in this Province (3 per cent. per decade under normal conditions) is the smallest. Again, the difference between the birth rate and the death rate per 1,000 is the smallest in this Province—6.5 in 1881-1891, and 0.6 in 1901-1911 as estimated by the actuary. The United Provinces also stands second on the list of those provinces and States which on balance lose by migration (—974,642 in 1921.)

Causes of the slow rate of growth of the population.

The fact that the normal rate of growth of the population in the United Provinces is slower than that in other provinces, that this Province loses by migration, and lastly the fact that during the last two decades the population has decreased (1 per cent. in 1901-11 and 3.1 per cent. in 1911-1921) would show that the pressure of the population on the soil in this Province is approaching the limit. This, however, is not admitted by the Census Superintendent. He shows that there was excess of births over deaths in

healthy years 1912-17 and excess of deaths over births in unhealthy years, 1911, 1918, 1919 and 1920. There was, he says, no connexion between excess of births over deaths or *vice versa*, and the agricultural, economic or commercial conditions of the decade, and concludes:—

"The conclusion of the whole matter is obvious, but it is so important that I may be pardoned for emphasizing it. The population reacts extravagantly to conditions of health. And this reaction completely cancels any reaction there may be to agricultural, economic or commercial conditions, which latter reaction, if it occurs at all, is so slight as to be negligible. Possibly this may be true of all tropical countries. But it appears to suggest, what is also suggested by the population figures when examined from other points of view, that congested though the Province may be, the limit of pressure of population on the soil is not yet in sight, and that in the absence of severe epidemics there is no present reason why the numbers of the people should not continue to increase."*

Over-crowded parts of the Province.

The most congested parts of the United Provinces are the Indo-Gangetic Plain East (density per square mile 711) and the Sub-Himalaya East (density 605). The percentage of gross cultivated (the double cropped added to the net cultivated area) to cultivable area is 122.0 in the case of the latter, and 110.8 in that of the former. This percentage is 98.7 in Sub-Himalaya West (density 399), 103.7 in Indo-Gangetic Plain West (density 508) 109·0 in Indo-Gangetic Plain Central (density 528), and 83.3 in Central India Plateau (density 198). Mr. Edye contends that density determines the percentage of gross cultivated to cultivable area, and states that "under present conditions the density will continue to increase, so far as its increase is not check-

*Report, 1921, p. 13.

ed by disease, until the limit is reached beyond which the percentage cannot expand." He holds that the figures of density in relation to the percentage of gross cultivated to cultivable area show "that the percentage is still capable of expansion even in the most congested divisions,"* and that the limit has not yet been reached in any part of the Province, except perhaps in the lands surrounding Farrukhabad City.

It may be interesting to learn Mr. Edye's explanation of the causes of migration from the United Provinces. He says :—

"It is remarkable that in spite of the greatly increased demand for labour in this Province that has been witnessed during the decade, the number of emigrants has not decreased appreciably. This fact bears out what must be the impression of any one who has acted as an Emigration Officer under the Emigration Act as the writer did for several years —that emigrants generally leave their homes not to better their prospects but to escape domestic unpleasantness."

Emigration.

The losses by emigration to distant provinces are borne mainly by the Eastern Plain, East Satpuras (North Mirzapur) the Gorakhpur district and certain districts of the Central Plain. It is admitted by Mr. Edye that the three first named tracts are highly congested. He estimates the number of those who permanently emigrated from the Provinces in 1911-21 as 500,000 men and 300,000 women.

Mr. Edye's conclusions differ in certain respects from those of his predecessor, Mr. Blunt, Census Superintendent in 1911. Mr. Blunt regarded the figures of cultivable area

*Report, 1921, p. 17.

as misleading, for all the area shown as cultivable is not really such. As regards the Eastern districts he wrote:—

"The pressure on the land has long been considerable in these tracts, and must still be very great, though plague has ruthlessly relieved it".*

And again :—

"There were signs ten years ago that the most densely inhabited tracts in the Province, the Eastern Plain and the Eastern Sub-Himalayas, were beginning to seriously feel the pressure of the population on them ; but the pressure is relieved, not by internal emigration to other parts of the Province, but by emigration to the east, to Bengal and Assam, and it was the growth of this emigration which showed that the tract was getting over-populated. But the pressure now is far less than it was ten years ago, for plague has proved a terrible though effective adjunct to emigration in relieving it."*

Why people emigrate.

According to this account disease and emigration are the necessary consequence of over-population. The view that people emigrate from the congested districts of the Eastern tract on account of "domestic unpelasantness," and not to better their prospects, is untenable. Apart from military emigration, there is a large emigration of domestic servants from the United Provinces ; there is a considerable volume of emigration to the collieries and practically the whole of the extensive river traffic of Bengal is in the hands of emigrants from this Province. The emigration in search of work is, as has been remarked above, chiefly from the Eastern districts. It is stated that there is not a single family in the Benares division which has not at least one member in the provinces of Bengal, Assam and Behar and Orissa. Taking

*Report, 1911, p. 49.

the statement to be only half true, Mr. Blunt estimated the number of emigrants who left the Benares division in search of work to be 3 or 4 lakhs. We have to remember that the United Provinces is industrially a backward province, Cawnpore being the only centre of some industrial activity. It is not surprising that labourers in the congested districts should try to better their prospects by seeking employment in the mills, factories and coal fields of Bengal, in the tea-gardens of Assam, in the cotton mills of Bombay, and in other parts of India. Calcutta and Bombay attract labourers not only from the United Provinces but also from other provinces of India. In every country there is some movement of labour from the industrially less developed to the more developed parts of the country, for example in Germany from the Eastern Provinces of East and West Prussia, Posen, Silisia, Pommern and Mecklenburg, towards the West Rheinland and Westphalia ; in England, from Scotland and Wales towards the south of England and the industrial districts of Central England ; in Austria from the east towards the west, and in Russia towards the industrial parts of the country in the east and the south. As a rule, the emigrants go from a place where social pressure is heavy to a place where it is less heavy, or where they can earn more and live under better economic conditions . Economic conditions and not "domestic unpleasantnes" are the chief factor which determines the volume of migration within a country, and also from country to country.

Connection between disease and economic conditions.

There is also a close connection between the prevalence of disease and economic conditions. Mr. Edye attributes the loss of 2,800,000 in the decade 1911-1921 to influenza. Plague accounted for 1,315,252, or 2.76 per 1,000 of the total deaths in the decade 1901-1911. Why does the population react extravagantly to conditions of health ?

Dr. Bentley's view.

There is a reference in the Bengal Report (Census of 1921) to an interesting enquiry made by Dr. C. A. Bentley, the Director of Public Health, Bengal, into the extent and distribution of malaria in Bengal. Dr. Bentley has been able to establish a close correlation between the prevalence of malaria and the changes of population in the last decade as well as in the decade 1901-1911. Dr. Bentley, we learn, "follows Malthus in the general proposition that growth of population is limited by the extent of the means of subsistence, and believes that malaria manifests itself in Bengal as the instrument of adjustment of such growth to economic conditions. He holds that in a large measure malaria is not a root cause of depopulation, but appears in localities which suffer adverse economic conditions, and keeps down the population by a less obvious, but essentially parallel train of reactions to those by which starvation produces the same result, depopulation, in the acutest stress of economic conditions, famine".†

New disabilities in the shape of an extreme rise of prices in the latter part of the decade, and the influenza epidemic, appeared in 1911-1921. It is suggested that "the incidence of the fresh disablities, of which the high mortality from influenza was one, as well as the prevalence of malaria depends and depended on economic conditions."†

The subject of the connection between disease and economic conditions has been discussed more fully elsewhere ; a reference to it here was necessary to show that Mr. Edye's statement that the reaction of the population in the United Provinces to conditions of health "completely cancels any reaction there may be to agricultural, economic or commercial conditions," does not end the matter.

† Census Report, Bengal, p. 37.

Bengal.

Variations in density in different parts of Bengal.

The average density of population over the whole of Bengal is 579 persons per square mile; excluding the hill districts of Darjeeling and Chittagong Hill tracts and Tripura State, the average density is 640. There are great inequalities in the distribution of the population even in the plains. The area with a density of 300-750 persons per square mile covers two-thirds of Western and Northern Bengal and nearly two-thirds of Central Bengal, but only 22½ per cent. of Eastern Bengal. The area with more than 750 per square mile covers about one-fifth of Western and Northern Bengal and somewhat less of Central Bengal, but no less than 44.3 per cent. of Eastern Bengal. The heavy density of population in Eastern Bengal may further be judged from the fact that 21.5 per cent. of the total area supports over 1050 persons to the square mile, as compared with 3.3 per cent. in North Bengal, 4.3 per cent in Central Bengal, and 6.3 per cent. in West Bengal.

The increase of population in Bengal has been greatest in those parts of the Province which are most densely populated :—

Province & Natural Division.	Area.	Population (000 omitted.)	Density.	Variation of population per cent.	
				1911-1921	1872-1921
Bengal	82,277	47,592	578	+2.8	+37.2
West Bengal . .	13,854	8,050	581	—4.9	+ 5.9
Central Bengal . .	17,410	9,461	543	+1.4	+27 8
North Bengal . .	20,365	10,938	538	+1.9	+25.1
East Bengal . .	30,648	19,142	625	+8.3	+72.4

The increase of 8.3 per cent. in the last decade in East Bengal may be contrasted with the decrease in West Bengal and the practically stationary population of Central and

North Bengal. The heavy density of population and the greater increase of population in the East Bengal is due to the greater productive capacity of its soil, as well as it better sanitary conditions.

The differences between the natural divisions of Bengal are further brought out by the following figures showing the density of population in eleven districts:

Density.

	Persons per square mile.	Persons per square mile cultivated.	Persons per square mile of the gross crops of a year.
Bankura (West) . .	361	793	780
Midnapur (West) . .	528	857	838
Nadia (Central) . .	535	814	583
Rajshahi (North) . .	569	760	646
Jessore (East) . .	593	770	636
Faridpur (East) . .	949	1,202	922
Mymensingh (East) . .	776	1,162	857
Dacca (East) . .	1,148	1,541	1,143
Tippera (East) . .	1,072	1,338	984
Noakholi, mainland only (East)	1,202	1,566	1,089
Bakarganj (East) . .	752	1,080	942

The difference between East and West Bengal in regard to density of population per square mile of the gross crops of a year is much less than the difference shown by the figures in the second column, but it is still appreciable.

Crop values and density of population.

Mr. Thompson, Census Superintendent for Bengal, makes an interesting attempt to correlate crop values for these eleven districts with density of population. The correlation is seen to be a close one. On the basis of the crop values of these districts, taking Midnapur to be 500, he estimates the density of population supportable in the eleven districts on the Midnapur standard, compares it with the existing density

of population and thus estimates the supportable increase at the Midnapur standard :—

	Relative crop values per sq. mile reduced to a standard according to which the total for Midnapur is 500.	Density of population supportable on Midnapur standard.	Density of existing population.	Supportable increase at Midnapur standard per cent.
Bankura (Sadar sub-division)	450	476	361	33
Midnapur . .	500	528	528	0
Nadia	658	695	535	30
Rajshahi . .	782	826	569	45
Jessore	845	889	593	50
Faridpur . .	1,134	1,198	949	26
Mymensingh . .	1,082	1,143	776	47
Dacca	1,279	1,351	1,145	18
Tippera . .	1,431	1,512	1,027	47
Noakholi (mainland)	1,453	1,535	1,202	28
Bakarganj . .	1,081	1,142	752	52

We may take an example to explain the meaning of these figures. Jessore's crop value is 845 as compared with Midnapur's 500. As compared with a density of 528 for Midnapur it can therefore support 889 persons. The existing density is only 593—it can therefore bear an increase of 50 per cent.

Underlying assumptions.

The calculation of the supportable increase in the last column, as Mr. Thompson points out, involves large assumptions. It cannot be exact. Mr. Thompson has explained his method of calculating crops values in Sec. 14 of the Report. The estimates of the outturn of crops are never absolutely reliable; and in such a calculation as Mr. Thompson has undertaken, any error in estimating the value of crops in Midnapur would affect the totals of other districts represented by proportionate figures. Any under-estimation of the value of crops in

Midnapur would lead to over-estimation on the Midnapur standard of the crop values of other districts, and of the supportable increase of numbers in these districts. Secondly, we are assuming that crop values alone determine density and no other factor need be taken into account. We may also note that according to the figures given above Bankura (West Bengal), Nadia (Central), Rajshahi (North) and Jessore (Central) are capable of bearing a substantial increase in population. But in the past the growth of population in these districts has been very slow. The population of Jessore has decreased at each census since 1881 owing to the unhealthiness of its climate. In the last decade the population of Jessore decreased 0.6 per cent.; of Nadia 8.6 per cent. Rajshahi 0.9 per cent. and Bankura (Sudar Sub-Division) 7.0 per cent. Without a sudden and very great improvement in public health no large increase, such as anticipated by Mr. Thompson, is concievable in these districts. Lastly, the supportable increase has been calculated on the Midnapur standard. But this standard may be too low. It is assumed in the table given above that no further increase in population in Midnapur is possible, but there is a further assumption that the agricultural wealth of Midnapur is sufficient for the existing population. What is the justification for this assumption? The natural population of Midnapur decreased by 4.9 per cent. in the decade 1911-1912. It is not a fertile district, and the recurrence of floods and the lack of drainage "have caused a permanent depreciation in the capabilities of the soil."* The number of emigrants from Midnapur has increased during the last twenty years. "The figures for Midnapore bear out the conclusion, which has been already reached," says Mr. Thompson, "that the pressure of the population on the soil is very great, and the fact that in spite of a decrease of population emigration has increased points towards the

* Bengal Report, 1921, p. 48.

suspicion that the capacity of the soil, at least in parts of the district, is deteriorating." *

There is no doubt that Midnapore is over-populated, and therefore the standard on the basis of which the possible growth of numbers in other districts is estimated is too low. It is also easy to see that if a higher standard were adopted the supportable increase would be less than the anticipated increase.

The population of Bengal increased 6.7 per cent. in the decade ending in 1881, 7.5 per cent. between 1881 and 1891, 7.7 per cent. between 1891 and 1901, 8.0 per cent. between 1901 and 1911, and 2.8 per cent. in the last decade. The increase in the density of population between 1872 and 1921 in the natural divisions of Bengal is shown below:—

	Density of Population.	
	1872	1921
West Bengal	459	581
Central Bengal	425	543
North Bengal	422	538
East Bengal	362	625
Dacca Division	511	866
Chittagong Division	298	512

The density in East Bengal has increased 72 per cent. In spite of the rapid growth of population the standard of living of the agricultural population in East Bengal is higher than in West Bengal, and this is attributed to the more favourable agricultural conditions in East Bengal.

Madras.

Density.

The mean density of population in the Madras Presidency is 297 persons to the square mile (291 in 1911). There are great variations in density between different parts of the Presidency. The Agency has only 75 persons to the square mile, Deccan 135, East Coast North 345, East Coast Central 375, West Coast

* Bengal Report, 1921, p. 48.

415 and the East Coast South, the most densely populated division, 442. If we consider the distribution of the population by *taluks* according to density it is found that 52 per cent. of the population live in *taluks* in which there are from 300 to 600 persons to a square mile, 20.4 per cent. live in *taluks* where there are more than 600 persons and 27.6 per cent. in *taluks* where there are less than 300 persons to the square mile. In 1911, 30.2 per cent. of the population lived in *taluks* where the density was less than 300 persons to the square mile, 41 per cent. in *taluks* with 300 to 500 persons and 28.8 per cent. in *taluks* with more than 500 persons to the square mile. It will be seen that the proportion of the population living in *taluks* with 300 persons is now smaller than before. This would indicate that the sparsely inhabited parts of the country are, under existing conditions, not capable of bearing a heavier population.

Movement of the population determined by agricultural conditions.

The Madras Presidency has no important manufacturing industries, and its population is predominantly rural. The movement of the population is therefore chiefly determined by agricultural conditions. Since 1871 the population of the Presidency has increased 35 per cent., of the Deccan division on the other hand has decreased 1 per cent. In the Deccan the annual rainfall is much below the average of the rest of the Presidency. It is also peculiarly liable to epidemic diseases, and in these two facts we find an explanation of the decrease of the population since 1871. The percentage of the net cultivated to cultivable area in the Deccan is 66.5, of double cropped 2.4, and the percentage of cultivated area which is irrigated 7.5. It would seem that the lack of rainfall is not made good by irrigation, and in view of this fact the possibilities of the growth of numbers in the Deccan must be very limited.

On account of its climate and the nature of its soil the Agency cannot support a larger population. There are only six *taluks* in the Agency where the density exceeds 100 persons per square mile, and all of these suffered a loss of population in the last decade. The density of the Agency fell by 3, and of the Deccan by 6 in the last decade.

In may be doubted whether the rest of the Presidency can bear a much heavier population. The Census Superintendent wrote in 1911 :—

"Whatever may be the vicissitudes that may attend colonisation and development of a new country, it may be assumed that in southern India density of population has now to a great extent adjusted itself to local possibility of subsistence and to climatic conditions. Although variations in the decennial rates of increase or decrease suggest possibilities of an ultimate change in the relative positions of districts, or of natural divisions not utterly dissimilar, it is on the whole improbable that, within any appreciably restricted period, the cumulative effect of such changes will be so marked as to render their consideration a matter of present necessity. The suggestion is confirmed by the figures which show that since the enumeration of 1891 the order of density among natural divisions has remained unaltered, while changes in district position have been so slight as to be for practical purposes immaterial."

The order of density in 1921 was the same as in 1911.

Lastly, the constant stream of emigrants which flows from the Madras Presidency to other parts of India and to foreign countries indicates that pressure on the soil in some parts of the Presidency at any rate has reached the limit.

Behar and Orissa.

Congested parts of the Province.

The mean density in Behar and Orissa is 340 per square mile. There are four natural divisions of the Province, North Behar, South Behar, Orissa and Chhota Nagpur Plateau. Of

these North Behar is the most congested (density 642) and the Chota Nagpur plateau the most sparsely populated (density 186). In the districts of Muzzaffarpur and in Darbhanga in North Behar the density of population is as high as 907 and 870 persons per square mile. In a large portion of North Behar, it seems, the point of maximum population has been reached. In 1911 the flat alluvial plain of North Behar was "almost entirely under cultivation." The Census Superintendent thus described the conditions in the Tirhut Division of North Behar—"the blackest of black spots on the famine map:" "Here the cultivators are practically dependent on one crop, *viz.*, winter rice. The population is dense, wages are low and rents high; when the rains fail, distress ensues among the landless labourers, but is mitigated by their increasing readiness to leave their homes and obtain work and wages elsewhere."†

The expansion of the population in South Behar is limited by hills and jungles, but the utilisation of irrigation facilities and the development of the industrial areas would encourage the growth of numbers. In parts of Orissa the density rises to over 1000 persons per square mile.

There is room for expansion in Chhota Nagpur Plateau and the Orissa States. They are inhabited by aboriginal races of great fertility and the development of coal, iron and other mineral resources and the growth of the iron and steel industry should provide increasing employment for the inhabitants, and enable them to raise their standard of living.

In the last decade the population of Bihar and Orissa decreased by 1.2 per cent., the heaviest decrease occurring in Orissa, 4.6 per cent., while the population of Chhota Nagpur practically remained stationary (+.1 per cent). The dominant factor which controlled the movement of the population was of course the influenza epidemic, but as has been pointed out

† Census Report, Bihar and Orissa, 1911 p. 17.

above, there is very little room for growth in the congested parts of South Behar and Orissa, and in North Behar.

Causes of emigration.

Behar and Orissa heads the list of Provinces and States which on balance lose by migration. In 1921 the net loss suffered by this province by emigration amounted to 1,567,968. The permanent flow of emigration from Behar and Orissa is towards Bengal and Assam. The tea plantations of Assam offer to the aboriginal races of Behar and Orissa "more steady means of subsistence" than they enjoy in their province. More important than the pemanent stream of emigration is the "enormous flow of periodic labour which pours out from North and South Behar between March and November into the agricultural and industrial areas of Bengal, returning towards the end of the year for the cultivating season in the home areas." *

It is not pretended that emigration from Behar and Orissa to Assam and Calcutta, which increased in the last decade, is due to such causes as "domestic unpleasantness." The Census Superintendent for 1921 says:—

"The great development of emigration is an indication of the hard times that Orissa has passed through since 1918, and also shows how it was that a repetition of the tragedy of 1866 was avoided. It would be difficult to over-estimate the number of lives saved by the East Coast route of the Bengal Nagpur Railway in the last years of the decade by bringing food to the people and, even more important, by taking the people to places where work and food could be found."

Bombay.

The following table shows the density per square mile and the percentage of net cultivated to cultivable area in the natural divisions of Bombay:

* Census Report, India, 1921, p. 86.

	Density per square mile on total area	Density per square mile on cultivable area	*Cultivable area*	
			Percentage of net cultivated	Double cropped
Gujrat . .	292	344	68	4
Konkan . .	222	512	45	2
Deccan . .	158	226	81	3
Karnatak .	187	240	86	1
Sind . .	71	124	29	3
Bombay Presidency	156	222	61	2

It will be seen that density on cultivable area is greatest in Konkan. The soil of Konkan is not especially fertile but it is a region of heavy rainfall. In the Kanara district density rises over 1100 inhabitants per square mile on cultivable land in the coast *taluks*. Rainfall in the Deccan is insufficient, and in consequence the Deccan is sparsely inhabited. The conditions are more favourable in Karnatak, which has a greater density of population than the Deccan. Gujrat receives the same amount of rainfall as the Deccan but the rainfall is less variable and better distributed. Sind is a sandy desert and cultivation here is possible only by means of canals.

In the last decade the population of the Presidency decreased by 1 per cent. Among the natural divisions Gujrat alone showed an increase (6 per cent.); the population of other divisions decreased, Sind suffering the greatest loss (7 per cent.).

The Census Superintendent has attempted to reconstruct the population of each district as it would have been, had there been no influenza epidemic. The figures, though purely theoretical, show the progressive character of the population of Gujrat, Khandesh and the inland Karnatak. But they also show that Kanara is declining fast and the North Konkan slowly. The loss of population in Konkan is due to emigration.

It cannot be doubted that in Konkan, in spite of the low percentage of the net cultivated to cultivable area, the pressure of the population on agricultural resources is great. The possibilities of expansion in Deccan and Karnatak are limited by the fact that 81 per cent. and 86 per cent. respectively of the cultivable area is already net cultivated.

Rainfall is the chief factor in determining the density of population in the Bombay Presidency, and next in importance is the configuration of the surface. Irrigation is not yet an important factor. Except in Sind, where cultivation wholly depends upon irrigation and where the percentage of cultivated area which is irrigated is 76, the irrigated area in the Presidency is small—4 per cent. in Gujrat, 4 per cent. in Konkan, 4 per cent. in Deccan and 3 per cent. in Karnatak.

The Bombay City.

We have referred before to the unstable character of the labour supply of Bombay City. Of the skilled and unskilled workers born in the Presidency 24.2 and 26.4 per cent. respectively belonged to the districts of enumeration, while 58.5 and 57.0 per cent. respectively came from other parts of the Presidency. The Bombay City attracts large numbers of immigrants from Ratnagiri (Konkan), where holdings are small and agricultural conditions unfavourable. "The Deccan," says the Indian Census Report, "contributes a larger proportion of its population to Bombay City than any other division and, evidently on account of persistent agricultural depression, has been throwing out population in increasing numbers to other divisions." 41 per cent of the skilled and 35.0 per cent. of the unskilled industrial workers in the Presidency belong to Maratha, Kunbi and other cultivating castes. It is obvious that the cultivating castes would not leave their traditional occupation and prefer factory life unless compelled by necessity to do so.

The Central Provinces and Berar.

This Province has a population of about 16 millions and a mean density of 122. The maximum density is 301 to the square mile in the Sakti State of Chhattisgarh. The percentage of cultivable to total area is 56, of net cultivated to cultivable area 61 and double cropped 5. The percentage of gross cultivated area which is irrigated, is 2.8. These figures would indicate that there is room for expansion in the Province, but a closer examination is necessary. The Province has valuable deposits of coal and manganese, but industrially it is backward. The Census Superintendent thus comments on the possibilities of further growth of numbers :—

" That the population even under present conditions has not reached the limit that can be supported is proved by the enormous mortality of the influenza epidemic which must have removed at least 6 per cent. of the inhabitants. The epidemic was not one of those diseases which nature is supposed to bring from time to time to equate the population in over-crowded areas to the means of subsistence, but a fortuitous infection of the population, which spread over the world. If the population before the epidemic could be supported, it follows that even under present conditions the reduced population has room to expand, at least up to the limit it had reached before the epidemic occurred. The conclusion appears irresistible that if economic pressure really called into being a struggle for existence in this Province which provided a stimulous to the population to seek for a real increase in the means of the subsistence, the time is still far distant when the economic law of decreasing returns would come into operation."†

Density.

Physical characteristics are of the greatest importance in determining density in this province. Density per square mile would be much

† Report, 1921, p. 26.

greater in the Maratha Plain Division (154) if the extensive forests of the Chanda and the Balaghat districts and the large area of uncultivable waste were left out of account. Density is low in the Chhattisgarh Plain Division (114) on account of the inclusion of the State of Bastar which consists largely of hills and forests and has only 36 persons to the square mile. The Chhota Nagpur Division (61) also consists largely of hills and forests with occasional tableland. If we consider statistics of density by tahsils it is found that 45.5 per cent. of the population, or nearly half, occupy 27.7 per cent. or a little more than a quarter of the area at a density between 150 and 300; 49.6 per cent. of the population occupy 70.5 per cent. of the area at a density of under 150 persons to the square mile. The area with a density between 300 and 450 is only 1.8 per cent. of the total, and supports 4.9 per cent. of the population.

In considering the possibilities of growth of numbers account must be taken of the physical characteristics of the Province, which explain its low mean density, and of the fact that in the more favourably situated parts of the province the land is fully occupied. In Berar and the districts of Nagpur and Wardha (Maratha Plain Division) which have a soil highly suitable for cotton, "practically all the cultivable land was occupied" † in 1911. Similarly the percentage of net cultivated to cultivable area is very high in the Chattisgarh Plain Division, excepting Raipur, Bilaspur and Drug. The percentage is 97 for Bastar (density 36) 93 for Kankar (density 87), 98 for Sakti and over 80 in other districts. The Chhota Nagpur Division has a mean density of 61, but the percentage of net cultivated to cultivable area is 75, while of the three districts for which this percentage is given two have 83 per cent. of the cultivable area under the

Possibilities of growth of numbers.

† Census Report, India, 1921, p. 19.

plough. It would thus appear that there is not much room for expansion in Chhota Nagpur Division or in the greater part of Chhatisgarh Plain Division or the Maratha Plain Division. In the Division last named, the percentage of net cultivated to cultivable area is low only in three districts, Chanda, Bhandara and Balaghat, (35,47,41 respectively), but it is probable that what is called cultivable area in these districts is largely uncultivable waste. We are thus left with the Plateau Division where the percentage of net cultivated to cultivable area is 46, and the Nerbudda Valley Division, where this percentage is 54. The former supports an actual population of a little over 1½ millions, and the latter 2½ millions. The Plateau Division lies on the Satpura range, and cultivation here is possible only in the more open tracts which contain fertile valleys. It is difficult to estimate the increase in numbers which these two Divisions can bear, but we may note that between 1911 and 1921 the mean density per square mile fell from 139 to 132 in the Nerbudda Valley Division, and from 102 to 95 in the Plateau Division, while it increased in the Maratha Plain Division and in the Chhattisgarh Plain Division.

Assam.

The population of Assam increased by 929,725 in the last decade, and of this 44.3 per cent. was due to migration. Assam heads the list of Provinces which on balance gain by migration.

The mean density per square mile in Assam is 130 but there are great variations in density in different parts of the province, from 37 persons per square mile in the hills to 941 in the Karimganj *thana* of Sylhet. The percentage of net cultivated to cultivable area is 25 for the whole of Assam, 23 for the Brahmaputra Valley, 70 for Surma Valley and 5 for the Hills. The Brahmaputra Valley attracts the largest number of immigrants, as it contains the bulk of the tea

plantations. The figures of net cultivated area show that there is considerable room for expansion in the Brahmaputra Valley. The Surma Valley is much more densely populated, and in the last decade it lost by migration.

"Assam" says the Census Superintendent, "is one of the few parts of India where there is still ample land awaiting settlers, and with no need for artificial irrigation." Colonisation of the Brahmaputra Valley is proceeding rapidly, the number of the colonists in 1921 increased five-fold as compared with the last census, and it is expected to increase 100 or 200 per cent. by the next census.

The tea-garden industry of Assam attracts labourers from Behar and Orissa, the Central Provinces, the United Provinces and Madras, while the settlers in the Brahmaputra Valley mostly come from Mymensingh, Dacca and other districts of Eastern Bengal.

Burma.

There is undoubtedly room for expansion in Burma. Burma is third among the Provinces and States of India which gain by migration, its net gain in 1921 amounting to 553,471. The population of Burma is a little over 13 millions and mean density per square mile 57. The population is not distributed evenly over the whole province. Rangoon and Mandalay represent two large patches and Moulmein and Akyab two small patches of heavy density. These four dense patches cover one-third of the area of the province and contain two-thirds of the population.

Burma is divided into four main natural divisions, of which the first, Burman, is further sub-divided into Delta, Coast, Centre and North. The Delta includes most of the immigrants into the province, including Indians and Chinese. It seems to be fully occupied, for the percentage of the cultivable area which was under cultivation in 1921 was esti-

mated to be over 90.† The Burmese are mostly concentrated in the Centre, though economically the Centre is of less importance than the Delta.

The population of Burma increased by 9 per cent. in the last decade.

The percentage of cultivated area in 1921 was estimated to be Burma 39, Coast 21, Centre 41 and North 33. These figures and the fact that the net gain of Burma by migration was greater in 1921 than in 1911 show that Burma is capable of absorbing an increase in the native population, as well as immigrants.

Summary.

The foregoing review shows that, with the exception of Assam and Burma, there is no province of India in which pressure on agricultural resources, in some part of the province or other, is not beginning to be seriously felt. Further, density is increasing in those parts of India which were already densely populated. It will not be denied that, under existing conditions, agriculture is supporting too many people in the districts of the Eastern Plain and in Simla, Kangra, Hoshiarpur, Gurdaspur, Amritsar, Jullunder, und Sialkot in the Punjab ; in the Indo-Gangetic Plain East and the Sub-Himalayan East in the United Provinces ; in Eastern Bengal ; in parts of the Madras Presidency, particularly those which lose by migration ; in North Behar and parts of South Behar in the province of Behar and Orissa ; in Konkan and parts of the Deccan and Karnatak in the Bombay Presidency; and in the Maratha Plain Division and the Chhattisgarh Plain Division in Central Provinces and Berar. One may say without fear of contradiction that these parts of the country are over-populated—that is they cannot bear a further increase in the numbers dependent upon agriculture without a fall in the standard of living of

† Census Report for Burma, 1921, p. 21.

the inhabitants, unless methods of cultivation are entirely changed and intensive cultivation is practised which, in view of the limited resources of the average Indian agriculturist, seems inconceivable.

In a preceding Chapter we have discussed the question of the increasing dependence on agriculture in the country as a whole. It may be interesting to study in detail the figures for individual provinces. The following table shows the percentage of the total population supported by agriculture and industries in the provinces at the censuses of 1901, 1911 and 1921:—

Percentage of total population supported by different occupations.

	Agriculture.			*Industry.*		
	1901	1911	1921	1901	1911	1921
India	65.2	69.8	70.9	15.5	11.4	10.7
Assam	84.2	85.4	88.0	7.8	3.2	2.6
Bengal	71.5	75.4	77.3	12.3	7.7	7.8
Behar and Orissa	.....	78.3	79.7	.....	7.7	6.9
Bombay	58.6	64.3	61.6	18.2	12.7	12.2
Burma	66.1	69.1	70.7	18.6	6.8	6.9
Central Provinces	70.0	75.5	74.2	16.2	10.2	9.3
Berar	73.2	.....	.....	12.9	.....	.....
Madras	69.0	68.7	70.8	17.5	13.4	11.3
Delhi	.....	.....	28.4	.....	.....	31.0
North West Frontier Province	56.9	66.7	65.0	19.4	11.5	12.6
Punjab	.....	58.0	59.0	.....	20.5	19.3
United Provinces	65.5	71.6	75.0	14.9	12.2	11.0

There is no province in which agriculture in 1921 did not support a higher percentage, and industries a lower percentage of the population than in 1901. In the Punjab, perhaps, the position has not changed much. But the table indicates generally the increasing pressure on the land everywhere, and the decline of industries.

The causes of the increasing dependence upon agriculture have been pointed out before, and they are similar in every province—the growth of imports and the competition of

machinery. While hand-industries are declining, we have failed so far to establish organised industries on a sufficiently large scale to provide employment for the hand-worker in factories.

"Back to the land in United Provinces.

To quote the Census Superintendent of the United Provinces, there is "a movement of the industrialist back to the land" in that province. In the last decade, while the population of the United Provinces decreased by 1½ millions the absolute number of those engaged in "farming" increased. "A certain surplus of the village artisan population is drifting into agriculture," says Mr. Edye, as the result of the competition of large-scale enterprises on the western factory system, and of certain cottage industries organised by small local financiers. The greatest sufferers have been the village potter, blacksmith and carpenter.

The rise in the prices of food grains during the last decade made agriculture more attractive than before, and increase in the demand for factory labour in the United Provinces had no effect in withdrawing labour from the land. "No wages will attract the peasant of the province," says Mr. Edye, "so long as his holding will maintain him in the standard of comfort to which he is accustomed. With grain at the prices prevalent since 1914 his holding will do this and more".†

The Bombay Presidency.

Similarly in the Bombay Presidency, in spite of the growth of the cotton factory industry, there has been a decline during the last twenty years in the proportion of the population supported by industries. The Census Superintendent quotes numbers supported by agriculture, and compares them with the numbers supported by industry and trade, British Districts, during 1901-1921, and concludes that "There is nothing in the

† Report for the United Provinces (1921) p. 159.

figures to lead to the idea commonly held that the people are forsaking the land for industries.''*

The Census Superintendent for Assam thus comments on the decrease in the proportion of those supported by industries :—

Assam.

" Assam is not an El Dorado. Apart from agriculture and tea, industry is of little account, and the statement in the margin hardly indicates growth, although certain industries have actually increased a little. It is true that there are plenty of natural resources in the country, and both organised and cottage industries, if developed, could well subsist and aid the return of prosperity, side by side with agriculture. But the obstacles to development are strong.''†

This statement about Assam may be taken to be typical of the rest of India. The country is rich in natural resources, and industry and agriculture could exist side by side and "aid the return of prosperity,'' but for reasons which are well-known, and which need not be examined here, the industrial development of the country was proceeding at an extraordinarily slow rate before the war. The consequences of this for the country as a whole were graphically described by the Indian Industrial Commission; so far as agriculture is concerned the consequences have been disastrous.

The Indian Census Report of 1921 makes an interesting comparison between the number of cultivators (workers) and the acreage cultivated. The results for different provinces are summarized below:—

* Bombay Census Report, p. 215.

† Assam Census Report, p. 170.

Province.	*The number of acres cultivated per 100 ordinary cultivators.*
Assam	296
Bengal	312
Behar and Orissa . .	309
Bombay	1,215
Burma	565
Central Provinces and Berar	848
Madras	491
North-West Frontier Province	1,122
Punjab	918
United Provinces . .	251

Size of the holding.

It is seen that the average size of the holding in India is very small. For India as a whole the average holding is probably of less than 5 acres. In Bengal there are 24,496,800 acres of land under cultivation in British territory, and the number of actual workers, ordinary cultivators, farm servants, field labourers and growers of special products in British Bengal is 11,060,629, which gives 2.215 acres per worker. "It is in such figures as these", says the Census Superintendent for Bengal, "that the explanation of the poverty of the cultivator lies."* In England and Wales there are about 21 acres per worker. The acreage per worker is very much greater in the Western States of America and Argentine, while in the Union of South Africa there are 460.2 acres per agricultural worker. In the congested districts of the Punjab, where well irrigation is practised, the average holding is four acres. In the Bombay Presidency as well as the United Provinces the majority of holdings are under 5 acres.

* Bengal Census Report, 1921, p. 382.

Sub-division of holdings.

The holdings are not only small, but they tend to grow smaller. This is the result of the Hindu Law of inheritance which entitles each male member of a family to an equal share in the family property from the time of his birth. The law secures an equitable and widespread distribution of land among the mass of the people, but is responsible for the excessive sub-division of land which has made the average holding uneconomic. An example of excessive sub-division of land to which the Hindu Law of inheritance has given rise is given by Dr. H. Mann, sometime Director of Agriculture, Bombay. In 1771, the average size of the holding in a village in the Poona district was 40 acres. By 1818 sub-division had reduced it to 17½ acres, from 1820 to 1840 the average size was 14 acres, and by 1915 it was no more than 7 acres. At the present time, 81 per cent. of the holdings in that village are under 10 acres, and 60 per cent. under 5 acres. Sub-division has led to fragmentation, and these holdings are split up into 729 separate plots, of which 463 are less than 1 acre, and 112 less than one-fourth of an acre.

Examples from Sialkot district.

Two geneological tables, illustrating the sub-division of land, have been given at the end of the Chapter. Jai Singh, who died in 1828, possessed 60 bighas (1 bigha=$\frac{5}{8}$ acre) in the village Saidoke, tahsil Nairowal, district Sialkot. He had five sons, each of whom got 12 bighas on the death of Jai Singh. At the present time the living representatives of Jai Singh's line possess no more than 1½ bighas each. Sudh singh, who died in 1779, possessed 96 bighas in the same village, Saidoke. He had an only son whose name is not known. Gulab Singh, the grand-child of Sudh Singh, inherited 96 bighas from his father. Narain Singh and Gurdit Singh, the two sons of Gulab Singh, got 48 bighas each on the death of Gulab Singh. The 48 bighas of Narain Singh were divided equally

between his three sons, Indar Singh, Burh Singh and Anup Singh. Indar Singh is still living; he has five sons who will each get $3\frac{1}{5}$ bighas each. Burh Singh and Anup Singh are dead. Burh Singh's four sons possess 4 bighas each and Anup Singh's two sons 8 bighas each. The 8 bighas of Man Singh (son of Anup Singh) are in seven different places and 4 bighas of Dalip Singh (son of Burh Singh) in nine different places.*

Fragmentation.

As has been said above, the exessive sub-division of land is due to the Hindu law of inheritance. Fragmentation, which means scattered holdings, is the result of customs connected with that law. Suppose a man owns 8 acres of land, divided into two plots. If he leaves two sons, each will get 4 acres, but not in one place. The two plots of 4 acres each will be sub-divided into sub-plots of two acres each. Further, the division must take place in such a way that each of the two heirs gets an equal share of good and bad land in each plot. The claims of justice are thus satisfied, but the consequences of such a system for the agriculture of a country can be easily imagined. The average holding, which is already too small, is not a compact holding; it consists of fields, very often long narrow strips, which lie scattered over the whole village. Many instances can be given of villages in the Punjab which are divided into hundreds of fields with an area of half a bigha or even less.

Effects of sub-division and fragmentation of land.

The excessive sub-division and the fragmentation of land in India are so important in their effects upon cultivation that one may say that they determine the character of Indian agriculture and the fate of the agriculturist. They prevent the peasant from growing valuable crops. They prevent him from making improvements in the land.

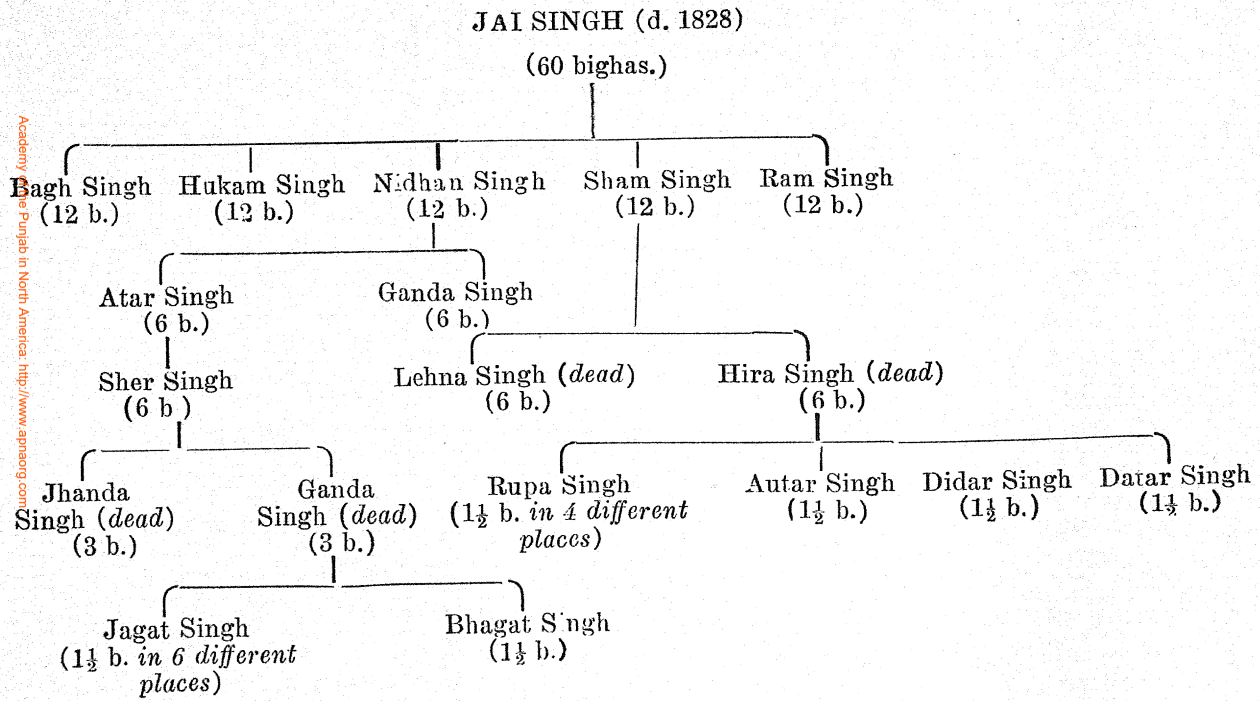
* I am indebted for this information to my post-graduate student Sardar Kapur Singh.

They cause neighbours to quarrel and are a fruitful source of litigation. It will seem that the Indian system of cultivation is still mediaeval. It reminds one of the three-field system which was the chief feature of English agriculture till the rise of modern capitalistic farming. No improvement of Indian agriculture is possible until the excessive subdivision of land, which has gone far enough now, is checked and a remedy found against the fragmentation of land. As regards the latter, co-operative consolidation of holdings societies have now been started in the Punjab, and they have achieved some success in bringing about re-grouping of holdings in some areas, which has given the owners solid and compact blocks of land in the place of scattered holdings.

The average holding in India is so small that there is not enough work for the cultivators. While there is a demand for labour in the industrial centres of the country, there are millions of people living on the land who are practically idle.

From what has been said above it should not be difficult to understand why India is a poor country. No one denies that agriculture is a source of wealth, but there is a limit to the number of people which agriculture can support under existing conditions, and the facts stated in this Chapter would show that in many parts of India the limit has been reached. Some of us seem to forget that manufacture is also a source of wealth, and fail to realise that lop-sided development, with excessive dependence on agriculture, must in the end impoverish the country. If the forces which are responsible for the gradual change in the occupations of the people during the last forty years were allowed to work unchecked for another 40 or 50 years, a state of affairs would be reached in which the average worker on the land would be practically reduced to starvation.

I



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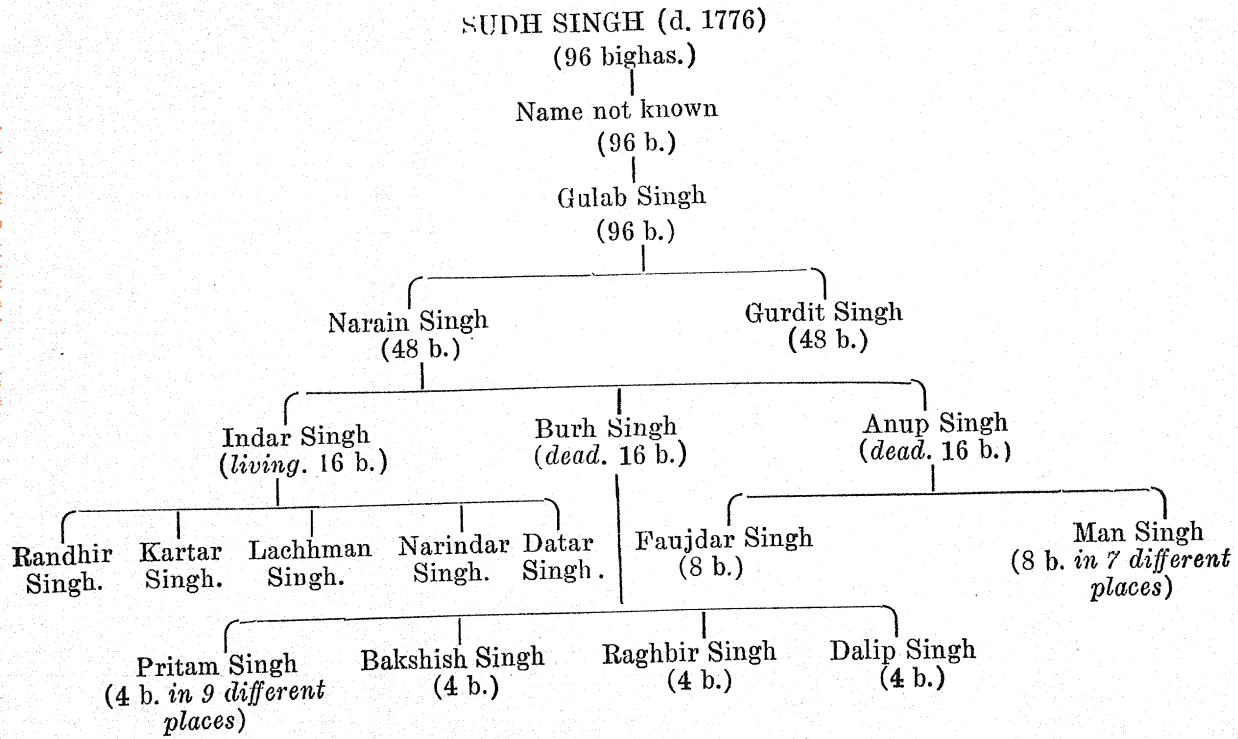

IX

NATIONAL INCOME

We have seen that the rapid growth of population in the leading European countries is explained by the rapid increase of their wealth and income. More or less reliable estimates of income and wealth for the United States of America, Germany, the United Kingdom, France and other countries are available. The wealth and income of the four chief Powers in 1914 were thus estimated:—

	National Capital.		*National Income.*	
	Amount in million £	Amount per head of the population. £	Amount in million £	Amount per head of the population £
United Kingdom	14,500	318	2,250	50
U. S. A. ..	42,000	424	7,250	72
Germany ..	16,550	244	2,150	30
France ..	12,000	303	1,500	38

The estimate for the United Kingdom is not likely to be inaccurate to a greater extent than 10 per cent.; for the other countries a margin of 20 per cent. has to be allowed.†

Estimates of national wealth for the United Kingdom are available for a very long period. The following figures, summarized from Knibb's *Private Wealth of Austriala and its Growth*, show the very considerable increase in the national wealth of the United Kingdom:—

†Paper on "The Wealth and Income of the Chief Powers," by J. C. Stamp, J. R. S. S. July 1919.

	Total Wealth. Million £	Wealth per head of the population. £
Petty's estimate of the capital of the people of *England* (about 1679)	250	46
Gregory King's estimate of the weath of the people of *England* (1688)	320	58
Estimate based on Decker's figures (1740) ..	480	69
Beeke's estimate of the wealth of *Great Britain* (Beeke's figures as modified by Giffen), 1800	1,740	158
Colquhoun's estimate of the wealth of the *United Kingdom* (1812)	2,736	161
Giffen's estimate for the *United Kingdom*:—		
„ „ „ 1865 ..	6,114	204
„ „ „ 1875 ..	8,548	259
„ „ „ 1885 ..	10,037	279

Between 1865 and 1914, the aggregate wealth of the United Kingdom increased from £6,114,000,000 to £14,500,000,000, and the wealth per head of the population, from £204 to £318.

Between 1900 and 1912 the national wealth of the United States of America increased from £18,188,000,000 to £38,577,000,000, and wealth per head of the population from £239 to £404. According to Dr. King, per capita income of the United States increased from £19 in 1850 to £68 in 1910.

According to Dr. Helfferich the aggregate national income of Germany increased from £1,050,000,000, in 1896 to £1,960,000,000 or £2,010,000,000 in 1911. There was an increase of 80 per cent. in aggregate and 45 per cent. in individual income.

The wealth of France was estimated by M.de Foville in 1886 to be £8,000,000,000, (including the national debt—always excluded in Giffen's estimates). In 1908 it was estimated by Edmund Thery at £11,400,000,000.

While we can form a fairly accurate idea of the present wealth and income of the leading European countries and

of the United States, and of the rate at which wealth and income of these countries have been growing, similar information is not available for India.

India. Lord Curzon's estimate.

According to the figures collected by the Famine Commission of 1880, the agricultural income of India was calculated at that date at Rs. 350 crores, or Rs. 18 per head. The non-agricultural income was taken to be Rs. 9 per head. Thus the total income per head of the population was estimated to be Rs. 27. In his budget speech in 1901 Lord Curzon, the Governor-General, estimated the agricultural income of India at Rs. 450 crores. This estimate was based on figures collected by the Famine Commission of 1898. The population for the same area as was covered by the computation of 1880 was 223 millions, and thus the agricultural income per head was Rs. 20—it had increased by Rs. 2 per head since 1880. Assuming that the non-agricultural income had increased in the same ratio—from Rs. 9 to Rs. 10—Lord Curzon concluded that the average income per head in 1901 was Rs. 30 per head as against Rs. 27 in 1880.

The precise data on which these estimates are based are, unfortunately, not available.

Giffen.

In a paper on "The Wealth of the Empire and how it should be used," read before the Economics and Statistics Section of the British Association in September 1903, Sir Robert Giffen estimated the capital or wealth of India at £3,000,000,000 and aggregate income at £600,000,000. In explaining the estimates he said:—

"India I would put down at 600 million £, which is certainly not a large amount for 300 millions of people; but where the adult ordinary labourer works for about Rs. 7 a month, if so much, or a little over £5 per annum, that is £1 per head, assuming a family of five persons, it would

hardly be safe to reckon that the aggregate income of the people is more than equal to twice the amount per head earned among the labouring classes who constitute the mass of the people.''*

Giffen took capital or wealth at five times the aggregate income. According to Giffen the income per head was £2 or Rs. 30, which was the same as Lord Curzon's estimate. It must be said that the estimates of wealth and income of the different parts of the Empire given by Giffen in this paper were only rough approximations, and were not intended to be exact.

Other estimates.

For more recent years the national income of India has been variously estimated, the highest estimate being that of Mr. Findlay Shirras for British India for 1922—total income Rs. 2,866 crores and per capita income Rs. 116. This is about four times greater than Lord Curzon's estimate of Rs. 30 per capita. There is no doubt that income, as measured in money, has very greatly increased. Prices to-day are more than double of what they were twenty years ago, and if per capita income had remained stationary, its money value to-day would be about 75 rupees. Calculations of income, however, must involve a very large conjectural element, for there has been no census of production in India, nor are other reliable data, necessary for the purpose, available. It will, perhaps, be more useful if, instead of calculating per capita income for the whole population, we try to form some definite idea of the income of certain important classes of the community as ordinary cultivators (who form the majority of the population) and the agricultural and the industrial wage-earners.

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* *Economic Enquiries and Studies*, Vol. II, p. 365. The labourers in the sense of hired workers are a minority of the population in India.

The Bombay Enquiry.

An interesting attempt was made in connection with census operations in the Bombay Presidency (1921) to ascertain the economic position of the Bombay family elsewhere than in large cities. 6,011 family budgets were collected by honorary workers in the five natural divisions of the Presidency. The level of economic life was found to be slightly lower in rural than in urban areas. The Census Superintendent, Mr. Sedgwick, who directed this enquiry, concluded that "the most common level of per capita income is in urban localities Rs. 100, and in rural localities about Rs. 75," subject to the doubt that the rural income was probably higher.

The annual net income by classes for all the families examined is shown by the table given at the end of the Chapter. The percentage of classes I—III (income from Rs. 0-75) to the total number of families in the five natural divisions was as follows:—

	Natural Divisions.				
Total families examined	Gujrat 1,387	Konkan 728	Deccan 1,309	Karnatak 1.320	Sind 1,267
Class of *per capita* income					
I .. Rs. 0-25 ..	0.9	13.6	2.5	3.0	0.6
II .. Rs. 25-50 ..	11.5	32.3	16.3	13.0	7.8
III . Rs. 50-75 ..	23.5	17.7	23.7	24.3	13.8
Total classes I-III ..	35.9	63.6	42.5	40.3	22.2

The majority of the families with an income of Rs. 75 or less were found to be in debt. The percentages of families in debt and free from debt to the total were as follows :—

[TABLE

	Classes			
	I-III	IV-V	VI-IX	X-XVIII
Gujrat—Not in debt	47	60	78	81
In debt	53	40	22	19
Konkan—Not in debt	32	52	63	70
In debt	68	48	37	30
Deccan—Not in debt	38	47	66	66
In debt	62	53	34	34
Karnatak—Not in debt	46	62	67	81
In debt	54	38	33	19
Sind—Not in debt	22	53	70	88
In debt	78	47	30	12

Taking all the classes together, the number and percentage of families in debt and of those free from debt were as follows:—

	Actual Numbers	Percentages
Gujrat—Not in debt	813	58.6
In debt	574	41.4
Konkan—Not in debt	325	44.6
In debt	403	55.4
Deccan—Not in debt	618	47.2
In debt	691	52.8
Karnatak—Not in debt	757	57.3
In debt	563	42.7
Sind—Not in debt	731	57.7
In debt	536	42.3

It will be seen that the percentage of families free from debt is lowest in Konkan. The percentage of families of classes I—III is highest in Konkan (63.6).

It may be further noted that of the total families examined (6,011) the number of those in debt was 2,767, or 46 per cent.

An analysis of expenditure showed that the percentage of the income spent on food was highest in the case of classes I—III, and that it fell steadily from the poorest to the richest class. The normal limits for percentages of expenditure under the different heads, taking town and country together, were found to be as follows:—

		Poorest	Richest
1.	Food	68.0	36.5
2.	Clothing	15.0	12.0
3.	Rental	4.0	4.0
4.	Ceremonies, charity etc.	4.0	11.5
5.	Other compulsory	3.0	10.0
	Total compulsory	94.0	74.0
6.	Education	0.7	3.0
7.	Doctor's, fees etc.	0.3	2.0
8.	Other voluntary	5.0	21.0
	Total voluntary	6.0	26.0

It will be seen that in the case of the poorest families practically the whole income is required to satisfy compulsory needs, and very little is left for education or doctor's fees.

The results of the Bombay enquiry are valuable as throwing some light on economic conditions in the Bombay Presidency, and one wishes that similar data were available for other parts of India. It would, however, be dangerous to generalise on the basis of the Bombay enquiry, for conditions in different parts of India are not uniform. For example, in the canal irrigated areas in the Punjab peasants who have enough land are undoubtedly prosperous, while in those parts of the country "Where rainfall is precarious and uncertain, and the soil shallow and poor, the income from all sources per head in a typical village has been calculated at Rs. 33-12 per annum as against a minimum of expenditure necessary for real needs in respect of food and clothing at Rs. 44 per annum."*

Is it possible to calculate India's aggregate agricultural income?

It is not possible to do so exactly as statistics of agricultural production of all kinds do not exist. We may, however,

*India in 1922-23, p. 198.

work on the basis of such figures of yield of crops as are available. The following table shows the yield and the value of the principal crops:—

Value of Agricultural Production of the whole of India.

	Quantity (in thousands)	Price assumed. Rs.	Value in thousand Rs.
Rice .. Tons	33,468	176.80 *per ton**	5,917,142
Wheat .. ,,	9,888	136.00 ,,	1,344,768
Barley .. ,,	3,117	95.25 ,,	296,894
Jwar .. ,,	6,157	89.76 ,,	552.652
Bajra .. ,,	2,420	108.80 ,,	263,296
Maize .. ,,	1,902	108.80 ,,	206,937
Gram .. ,,	5,205	95.25 ,,	495,776
Ragi .. ,,	2,094	174.08 ,,	364,523
Other food-grains and pulses ,,	20,461	171.36 ,,	3,506,196
Sugar-cane ,,	2,994	13.3 *per md. of sugar*	1,080,834
Cotton .. Bales of 400 lb.	5,181	40 *per md.*	1,007,242
Jute .. ,,	8,481	100 *per bale*	848,100
Linseed .. Tons	532	274 *per ton*	145,768
Rape and Mustard ,,	1,213	260 ,,	315,440
Sesamum .. ,,	484	334 ,,	151,656
			16,495,224

The value of these crops at present prices may roughly be taken to be Rs. 1,650 crores.

* Per maund of 82.7 lbs. as follows :—

	Rs.		Rs.
Rice	6.5	Maize	4.0
Wheat	5.0	Gram	3.5
Barley	3.5	Ragi	6.4
Jwar	3.3	Other food-grains and pulses	6.3
Bajra	4.0		

The Table includes the principal crops grown by the ordinary cultivator* but it does not include certain seeds, and fibres and fodder crops. We know the area under these crops, but no estimates of yield are available. Again, statistics of area and yield of the crops shown in the Table are incomplete. The value of the total agricultural produce of India in a year must, therefore, be greater than Rs. 1,650 crores. However, a sufficient margin for error will have been allowed if we assume that the value of the produce ignored by the Table is Rs. 350 crores. We shall not be accused of understating the agricultural income of India if we put the total at Rs. 2,000 crores.

This is gross agricultural income. The net income is found by deducting from the gross income expenses of cultivation. These, roughly, may be taken to be 40 per cent. of the value of the produce†. The total net agricultural income in a year is thus Rs. 1,200 crores.

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* The term excludes growers of special products such as tea, coffee, cinchona, rubber and indigo, and fruit, flower, vegetable, betel, vine, areca-nut, etc., growers.

† The yield and cost of cultivation of wheat per acre in the village of Bairampur (Hoshiarpur District, Punjab) have been thus estimated:—

Yield	Rs.	A.	P.
451.61 seers of wheat at 7 seers per rupee	64	8	2
21 *tangars* of *bhusa* at Re. 1 per *tangar*	21	0	0
Costs Total	85	8	2

	Rs.	a.	p.	Percentage of value of produce
Cost of a pair of plough-cattle, charges on account of depreciation of plough-cattle, and the cost of feeding the pair for a year, together with the cost of implements, represented as an annual payment	10	14	3	12.7
Seed	4	11	5	5.5
Weeding, reaping and winnowing	11	1	10	13.0
Payment to *lohar*, *tirkhan* and *chamar*	0	14	1	1.0
Land Revenue and cesses	4	7	0	5.2
Total	32	0	7	37.4

(Report on the Economic Survey of Bairampur, under-

What is the number of persons among whom this income is to be divided?

According to the census of 1921 Ordinary Cultivation supports 221,649,148 persons. They are classified as under:—

Ordinary cultivation	221,649,148
Income from rent of agricultural land	9,986,419
Ordinary cultivators	173,122,061
Agents, managers of landed estates, (not planters), clerks, rent collectors etc.	614,751
Farm servants	6,027,183
Field labourers	31,897,734

Ordinary cultivators thus number 173 millions. We may ignore farm servants and field labourers, for in estimating net income allowance has already been made for payments to them. We may also ignore for the present rent receivers, and agents, managers of landed estates etc. The net per capita income of ordinary cultivators is found by dividing the aggregate net income (1,200 crores) by the number of ordinary cultivators (173 millions)—Rs. 69½.

This is the net per capita income of the ordinary cultivator, assuming that he has to make no other payments except for costs of cultivation and to the Government. But besides the Government and the cultivator there are other parties who have an interest in the land. The cultivator must share his produce with the landlord when he does not own his own land. The net per capita income of ordinary cultivators, after paying the landlord's dues, must be less than Rs. 69½. It is difficult to say how much less,

taken under the auspices of the Standing Board of Economic Enquiry, Rural Section, Punjab, by Ram Lal Bhalla, M.A. Page 126).

but it is obvious that allowance must be made for the payment of rent.*

The above calculation does not pretend to be exact.

We have tried above to form a rough idea of the net per capita income of cultivators, but it is necessary to warn the reader that our calculations are not exact. We have to depend upon a series of gusses. In the first place, complete statistics for the whole of India of acreage under cultivation do not exist. In the second place, the statistics of yield of crops, though taken from official sources, are not wholly reliable. Thirdly, and this is particularly important, agricultural production is not stable—it fluctuates from year to year according to the seasons. The income of the agriculturist is, therefore, subject to violent changes. Fourthly, all calculations of income in terms of money are affected by changes in prices; a rise of prices increases per capita income and a fall diminishes it. At present prices the value of our agricultural produce is, say, 2,000 crores, but if prices rise or fall ten per cent. it would be proportionately increased or diminished. Lastly, account has not been taken of all sources of income. Cultivation of land, in many cases, is not the sole occupation of the cultivator. He combines it with cottage industries as weaving, pottery etc. or with carting or field labour. Column 10 of the Census Schedule dealt with subsidiary occupations, but the difficulties in the way of obtain-

* In Bengal, Behar, Oudh and the Central Provinces, almost the whole of the land is given out on rent by landlords who hold it from Government; the greater portion of Agra and half of the area of the Punjab are similarly let out. Bombay, Madras (all but the northern portion), Berar, most of Assam and Burma are Ryotwari provinces, and in these areas, generally speaking, there is no intermediate class of landlords between the Government and the cultivators.

Where rents are paid in kind, the landlord's share varies from two-fifths to one-half.

ing trustworthy information about subsidiary occupations were found to be so great that all-India returns of subsidiary occupations were not compiled Column 10 of the Schedule, says the Census Superintendent of Bombay (1921), "is burdensome in itself, sets too high a premium on the honesty and diligence of the enumerators, and is increasingly neglected."† He therefore abandoned Imperial Table XVIII—Subsidiary Occupations of Agriculturists.*

Has the per capita income of ordinary cultivators increased during the past twenty years ?

In answering this question we must first assume that their income from subsidiary sources represented the same proportion of their total income in 1921 as in 1901. We make this assumption for we have no data for estimating the income from subsidiary sources. The assumption, however, probably correspends to facts, for while the income of cultivators from some subsidiary sources has increased, from others, for example cottage industries, it has declined. On the whole the income from subsidiary sources probably represents to-day the same proportion of the total income of the cultivator as twenty years ago.

Allowance must be made for the rise of prices.

On account of the rise of prices net per capita income must be much more than double of what it was in 1904. But in order to find the increase in real income, allowance must be made for the rise of prices. It may be pointed out that

† Report p. 213.

* Details of occupations combined with agriculture in the Punjab are given in the Punjab Census Report (1921), but, for reasons stated above, the figures must be treated with reserve. The total number of cultivators (rent-payers), actual workers, is 4,265,527; actual workers who returned subsidiary occupations number 290,724, or 7 per cent. of rent-payers (actual workers). See Punjab Census Report, 1921, p. 377 (Part I).

when the rise of prices is general and not limited to agricultural produce, the mere increase in the value of agricultural produce does not indicate a proportionate increase in welfare. The point is simple, but the error of supposing that the rise of prices is a cause of prosperity is so common in India that we may give an example to illustrate our meaning.†

† It is not sufficiently realised that high prices also mean high costs. The enhanced cost of living has raised the price of labour and there is a growing tendency to substitute contract for status and competition for custom.

Some idea of the rise in another factor of cost, the price of plough-bullocks, may be formed from the following figures:—

Price of a pair of plough-bullocks in the Punjab in Rs.

	1902	1921
Ferozepur ..	75	335
Delhi ..	103	341
Lahore ..	113	202
Rawalpindi ..	75	300
Multan ..	70	221

A general rise of prices is not an unmixed blessing to the cultivator, for while the value of his produce rises, his cost of living also increases. The general rise of prices before the war did not much affect the cultivator, for the value of his produce rose to a greater extent than the prices of manufactured goods, but the position was reversed during the war. Mr. Datta noted that during the last three years of the period of his Enquiry (1910-12), the average rise in the price of raw cotton was 58 per cent. while the price of cotton manufactures rose only 31 per cent. (Prices Report, p. 36). Between 1913 and 1919, while the price of raw cotton (Broach) rose from 100 to 206, the average price of imported cotton goods rose from 100 to 279. The rise in the price of raw cotton and cotton manufactures in more recent years is shown by the following figures:—

Wholesale Prices Index Numbers in Bombay, July 1914=100

	Raw cotton	*Cotton manufactures.*
July 1920	144	318
Oct. 1921	169	273
„ 1922	165	226
„ 1923	211	217
„ 1924	260	223

As compared with the year 1904 the rupee has lost about three-fifths of its value, or the purchasing power of the rupee to-day is equal to less than 6½ *as.* Suppose the purchasing power of the rupee is suddenly reduced to one-billionth part of what it is to-day. The per capita income of the cultivator would be raised to about 70 billion rupees. But of course this means nothing at all. Income would be reckoned in billions, but the purchasing power of income would be the same as before. The fact that you have more tokens in your pocket proves nothing; the real question is whether your income would buy more commodities and services than before. This is the real test of prosperity.

The real increase in the income of cultivators as a class is measured by the increase in production. It cannot be doubted that money income is much greater than before. For our purposes, however, it is more important to inquire whether the net per capita *real* income of the cultivator has increased. It is only thus that we can form some idea of the economic position of the cultivator.

The number of ordinary cultivators.

It is necessary first to ascertain the exact increase in the number of cultivators. The number of ordinary cultivators is given in the Census Tables of 1921 and 1911, but the system of

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The price of raw cotton has risen rapidly during the last year, but till October 1923 the position was that the price of cotton manufactures had risen to a greater extent than that of raw cotton. Similar is the case with metals. In July 1920 the index number of Metals stood at 288 (Food 216). Since then the price of metals has been falling, but in September 1924, the index number of Metals (169) was still one point higher than that of Food (168); in October Metals stood at 167 and Food at 170.

It therefore appears that when general prices are rising, a large part of the gain of the cultivator from the rise of prices is purely illusory. His position would be of considerable advantage if the prices of manufactured goods did not rise while he obtained constantly rising prices for his produce, but this is impossible.

classification in 1901 was different. Agriculture (V) was divided in the Census Tables of 1901 into four sub-classes : Land-holders and Tenants (10) Agricultural Labourers (11) Growers of Speeial Products (12) and Agricultural Training and Supervision and Forests (13). The orders 36 and 37 under sub-class (10) gave the number of rent receivers and rent payers. These two orders correspond to Income from Rent of Agricultural Land and Ordinary Cultivators, the first two orders of the Census Tables of 1911 and 1921. We may, therefore, compare the total of these classes for 1921 with that for 1911 and for 1901.

In thousands

	1921	1911	1901
Total population classified according to occupation . .	316,055	313,470	294,188
Income from rent of agricultural land	9,986	7,743	*45,810
Ordinary cultivators	173,123	167,015	†106,873
Total . .	183,109	174,758	152,683

* Rent receivers. † Rent payers.

The percentage of the population supported by the two orders combined to the whole population in 1901, 1911 and 1921 was 51.9, 55.7, and 57.9 respectivelly, *i.e.*, the two orders supported a higher percentage of the population in 1921 than in 1901. Further, between 1911 and 1921 the increase per cent. was 4.8 as compared with the 1.2 per cent. increase of the whole population. The increase between 1901 and 1921 was 19.9 per cent. The increase in the total number of those classified according to occupation between 1901 and 1921 was only 7.4 per cent. Taking the whole population, the real increase was from 296.5 millions in 1901 to 318.9 in 1921, or 7.5 per cent.

Probable decrease in per capita real income.

It cannot be doubted that the number of ordinary cultivators and rent receivers has been growing more rapidly than the acreage under cultivation or the amount of production. This

need not occasion surprise. In Chapter V we made a study of the causes of the increasing dependence on agriculture. The decline of industries, as we have seen, is responsible for the increasing pressure on the land. Of course cultivation has not remained stationary, but the growth of agricultural production is always a slow process. As compared with the 19.9 per cent. increase in the number of cultivators and rent receivers the total area under cultivation increased 13 per cent., if so much.† The result of the growing pressure on the land is seen in the constantly diminishing size of the holding. In these circumstances it is more than doubtful if per capita real income of ordinary cultivators has increased. All our facts point to the conclusion that it has probably decreased.

So far we have dealt with the producer who works on his own account. What is the position of the hired worker?

Agricultural wages.

Agricultural wages rise more slowly than wages in organised industries. This is due to several reasons. The influences which determine wages in towns are becoming increasingly competitive, but agricultural wages are more subject to custom. This is shown by the fact that in most of our villages wages are still partly paid in kind. Secondly, while factory workers are learning to combine in order to enforce their demands, agricultural labourers are absolutely unorganised. The latter are also more ignorant and generally less business-like than the town workers.

While agricultural wages are rising it is extremely difficult to guage the extent of the rise. A quinquennial

† Area under cultivation in British India in thousands of acres :—

	Food-crops	Non-food crops	Total
1902-03	192,519	34,930	227,449
1921-22	215,508	40,731	256,239

wages cansus is taken in rural areas in most provinces, but owing to the fact that the custom of paying part of the wages in kind still continues, it is doubtful whether the rates of wages quoted in money (which include the value of supplements) for unskilled agricultural labourers, village carpenters, blacksmiths and others are reliable. No general average rates of wages paid to agricultural labourers in the whole of India exist, nor would they be of any use. We may therefore study the fluctuations in agricultural wages in a particular province, say the Punjab, where wages are generally much above the level of other provinces.

Rates of daily wages in annas, (including money value of any supplements in kind) paid to agricultural labourers in the month of December :—

Range of rate Annas	*Number of villages.* 1922	1917	1912
1.5 to 2.5	5	23	53
2.5 to 3.5	6	68	94
3.5 to 4.5	62	219	297
4.5 to 5.5	92	206	401
5.5 to 6.5	164	270	360
6.5 to 7.5	83	172	171
7.5 to 8.5	383	504	184
8.5 to 9.5	105	79	37
9.5 to 10.5	227	135	14
10.5 to 11.5	74	33	6
11.5 to 12.5	389	15	0
12.5 to 13.5	56	0	0
13.5 to 14.5	81	1	0
14.5 to 15.5	15	1	0
15.5 to 16.5	108	0	0
16.5 to 17.5	5	0	0
17.5 to 18.5	9	0	0
18.5 to 19.5	6	0	0
19.5 to 20.5	2	0	0
20.5 to 21.5	0	0	0
21.5 to 22.5	3	0	0
22.5 to 23.5	2	0	0

It will be seen that in 1912 the rates paid in the largest number of villages selected for enquiry were 4½ to 6½ annas ;

the predominant rate in 1917 was 7½ to 8½ annas; in 1922 there were two predominant rates, 7½ to 8½ annas, and 11½ to 12½ annas. These figures may not possess much scientific value, but they are still useful in showing the general trend of agricultural wages.

The influence of custom in governing payments in kind to agricultural labourers has been referred to above. But it must not be supposed that agricultural wages are wholly customary. Money has been introduced into the village, and money economy is replacing barter. On this subject the *Report on the Third Regular Wages Survey of the Punjab (1922)*, from which the above figures have been taken, says :

"Both the graphs and the tables indicate a general rise in wages with a tendency to abandon conformity to a typical wage. There is still, however, a fixed wage for unskilled labour in a particular village, but it tends more and more to have a competitive rather than a customary value. Where labour is plentiful the rates are low and *vice versa*. Moreover in villages where the land-owning tribe is hard working (*e.g.*, Arains or Jats of the Eastern Punjab) their menials tend to work hard and remain occupied, and to command a high price for their labour; while in villages of idle zamindars the menials also tend to be idle and to get less wages."

Industrial wages.

The war was a period of great industrial unrest in India. The main causes of the unrest were economic. Even before the war the Indian factory labourer was living from hand to mouth. The great rise of prices during the war, which was not accompanied by a corresponding increase in money wages, made his economic position worse. The cost of living as measured by changes in the prices of the necessaries of existence rose 83 per cent. in January 1919 as compared with the average of July 1914. The average increase of wages in various industries between 1914 and 1919 is summarised below :—

Cotton spinning and weaving industry	54 % including 35 % temporary war allowance.
Cawnpore woollen industry	19 %
Coal mining industry, Bengal	16 %
Tea industry, Assam	19 %
Jute industry, Bengal	13 %
Railway Locomotive Workshops, Punjab.	39 %
Engineering Workshop, United Provinces.	28 %
Army Boot Factory, Cawnpore	19 %
Paper industry, Bengal	No change.
Brewing industry, Punjab	30 %
Rice industry, Rangoon	No change.

The average of these increases is 21½ per cent. In view of the much greater rise in the cost of living, the outbreak of a series of strikes in 1920, affecting almost all industries, is not surprising.

It cannot be denied that as the result of strikes, workers in many industries were able to obtain a considerable increase in wages. Industrial wages have risen substantially, though it is difficult to determine exactly whether real wages have risen or fallen over a great part of the country. Statistics relating to wages are published annually in a report known as the *Prices and Wages in India*. Summary tables, roughly indicating the course of wages, based on statistics published in the *Prices and Wages* are given at the end of the Chapter. It would appear that between 1913 and 1922 industrial wages rose 40 to 75 per cent., more in some cases and less in others.

Wages in the cotton industry.

We possess more detailed information about the variations in wages in the cotton industry of the Bombay Presidency. Sometime ago an official enquiry was undertaken into wages and hours of labour in the Bombay cotton industry. The object of the enquiry was to ascertain the amount actually earned by all classes of work-people

in the month of May 1921 as compared with May 1914. The results of the enquiry are summarised below :—

	Average monthly earnings per head.		Increase per cent. in 1921 over 1914.
	1914 May	1921 May	
Average for Bombay Presidency . .	Rs. a. p	Rs. a. p.	
Men	17 0 8	33 6 10	96
Women	9 0 1	16 9 1	84
(a) Big lads and children . .	7 13 4	17 3 7	119
(a) All work people . .	14 11 11	28 14 4	96

(a) Counting two half-timers as one full-timer.

Money wages in Bombay rose about 100 per cent. The cost of living, as compared with July 1914, rose 77 per cent. in 1921, from which it may be concluded that real wages of Bombay cotton workers were higher in 1921 as compared with 1914. The actual rate of money wages paid to workers, however, was not high. The majority of men workers in Bombay, Ahmedabad and other centres earned between 12 annas and Re. 1-8 per day, excluding over-time pay, bonus and other concessions. Half the number of men in Sholapur earned under 12 annas. Nearly half the number of women workers in Bombay (City and Island) and Ahmedabad earned between 12 annas and Re. 1 a day, and in Sholapur over nine-tenths earned under 8 annas a day. The average daily earnings of full-time workers in May 1921 are shown below:—

Centres.	Men.	Women.	Big lads and children.	All work people.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Bombay City and Island . .	1 5 6	0 10 9	0 11 1	1 2 10
Ahmedabad . .	1 5 0	0 12 1	0 11 4	1 2 7
Sholapur . .	0 5 11	0 6 9	0 9 1	0 12 8
Other centres . .	1 1 8	0 10 1	0 8 11	0 15 6

The average total daily earnings of a coal miner in Bengal were 12 annas in January 1922, and the average monthly earnings of Non-Act coolies in the Tea Gardens in Assam in 1920-21 were Rs. 7-0-9, which gives a daily average wage of less than 4 annas.

The skilled workman in India is in a position of advantage, for there is great scarcity of skilled labour, while there is a continually increasing demand for such labour. The wages of the skilled workman, therefore, tend to rise more rapidly than those of the unskilled.

The standard of living.

Much light is thrown on the conditions relating to the well-being of the working classes in Bombay City and Island by the report, published in 1923, on an enquiry into working class budgets in Bombay undertaken in 1921-22 by the Labour Office, Bombay. 2,473 working class family budgets, and 603 single men's budgets—a total of 3,076 budgets were collected. About half the budgets referred to cotton mill workers, the remainder being budgets of municipal workers, dock labourers, and railway and engineering workers. The average working class family consists of 4.2 persons, *viz.*, 1.1 men, 1.1 women, and 2.0 children under 14, exclusive of .6 dependents living away from the family. The average earnings of the family per mensem of all the 2,473 families is Rs. 52-4-6, or 17*s.* 5*d.* per week. If we include average earnings in the 603 single men's budgets (Rs. 43-10-3 per mensem or 14*s.* 7*d.* per week) the average earnings of men for the total of 3,076 budgets drop to Rs. 42-9-6 per mensem or 14*s.* 7*d.* per week. The income of 75 per cent. of the families for which budgets have been calculated ranges between Rs. 40 and Rs. 70 per mensem. How is the income spent ? The percentage expenditure on the main groups was as follows ;—

Food	56.8	per cent.
Fuel and lighting	7.4	..
Clothing	9.6	..
House-rent	7.7	..
Miscellaneous expenditure	18.5	..
	100.0	

Thus more than half of the total family income was spent on food. The percentage of expenditure on food was found to decrease as the income increased, thus confirming Engel's Law. When these results are compared with the results of similar enquiries in other countries it is found that the proportionate expenditure on food in countries with a high standard of living, as the United States, the United Kingdom and Australia, is lower than in India.

Food.

The quantity of food consumed by the industrial workers in Bombay is insufficient. "The general conclusion," says the report, "is that industrial workers consume the maximum of cereals allowed by the Famine Code, but less than the diet prescribed in the Bombay Jail Manual." The following table shows the daily consumption of cereals and other articles of food per adult male in lbs. as arrived at from 2,473 budgets of working class families in Bombay, and the jail allowance:—

Articles.	2,473 Family Budgets.	Bombay Jails.	
		Hard labour	Light labour
	lbs.	lbs.	lbs.
Cereals	1.29	1.50	1.38
Pulses	.09	.27	.21
Beef and mutton	.03	.04	.04
Salt	.04	.03	.03
Oils	.02	.03	.03
Others*	.07	..	..
Total	1.54†	1.87‡	1.69

* Includes sugar, tea, milk and ghee (clarified butter).

† Exclusive of sweetmeats, condiments, spices, vegetables, fruits, fish, refreshments and other food for which no estimates of quantity figures are available.

‡ Exclusive of onions, condiments, vegetables and tamarinds.

It is a remarkable fact that workers in one of the leading Indian industries do not get more cereals to eat than the famine allowance for diggers, and that they actually get less than the jail allowance for prisoners. "The standard of comfort," says the report, "is not high. The necessaries for efficiency are not as great as they ought to be." One may doubt whether the necessaries for existence in the case of the majority of workers are as great as they ought to be.

As regards fuel and lighting, working class families do not use gas or electricity; kerosine and wood represent the whole expenditure under this head. The expenditure on clothing was found to be particularly low in the lowest income class (below Rs. 30 per mensem), and it is a cause of indebtedness. As regards housing, 97 per cent. of the working class families whose budgets were tabulated were living in over-crowded single rooms. But the question of providing additional quarters for the industrial population is engaging the attention of the authorities, and it is expected that by 1929 the tenements now being constructed by the Development Directorate will provide accommodation for 200,000, or nearly one-sixth of the present total population of Bombay City.

The working class families, except the highest income class, spend practically nothing on education. At least 4 per cent. of the total expenditure is accounted for by drink—the percentage is higher in the case of some classes. The consumption of liquor by the industrial population has increased, and this is probably connected with the conditions under which the industrial workers live. 47 per cent. of the working class families were found to be in debt. The annual rate of interest paid by debtors is one anna in the rupee per mensem, or 75 per cent. per annum.

Conclusion.

We have made no attempt to estimate the value of India's non-agricultural income. It is difficult to do so for complete statistics of output of organised industries do not exist, while it is impossible to ascertain the output of unorganised industries and small businesses (employing less than 10 persons), or its value. We have, however, formed some rough idea of the net income of the ordinary cultivator. This is of no small importance, for ordinary cultivators, as we have seen, form the majority of the population and the major portion of India's national income is agricultural. We have seen that the number of ordinary cultivators has been increasing rapidly, more rapidly than the area under cultivation or the rate of growth of the whole population. This is a most serious fact, for once it is accepted, there is no escape from the conclusion that the net per capita income of the cultivator is not increasing, unless it can be shown that the yield per acre has materially increased.

This conclusion suggests two things, first, that positive checks to population will continue to work in India unless customs relating to marriage are changed, and second, that in order to raise the level of national income it is absolutely necessary to find new sources of non-agricultural income and to develop old ones.

It must be brought home to the masses of India that it is useless to bring children into the world who will not live. A high birth rate has a high death rate as its necessary consequence. And so far as the rate of growth is concerned, we may, for an annual increase of 8 per mille, choose a birth rate of 45 and a death rate of 37, or a birth rate of 35 and a death rate of 27. Which is more preferable?

Unfortunately, marriage is regarded as a religious duty in India, and the age of marriage is low. A Hindu must marry and have a son, or he cannot go to Heaven. It is doubtful if every Hindu goes to Heaven; it is certain that

many a Hindu lives in Hell on earth. The leaders of the orthodox school, who are opposed to every reform not countenanced by religion, do not realise the extent of the suffering caused by the universality of marriage and the early age of marriage.

On the subject of national income Lord Curzon in the course of his budget speech in 1901 said:—

"There are certain preliminary propositions to which I think that every one must assent. In every country that is so largely dependent upon agriculture, there comes a time, and it must come in India, when the average agricultural income per head ceases to expand for two reasons: first, that the population goes on increasing, second, that the area of fresh ground available for cultivation does not increase *pari passu*, but is taken up and thereby exhausted. When this point is reached, it is of no good to attack the Government for its inability to fight the laws of nature. What a prudent Government endeavours to do is to increase its non-agricultural sources of income."

By its very nature agricultural income in an old country is more or less inelastic. No one will accuse the Government of neglecting agriculture. The efforts made to improve the methods of cultivation and to add to the irrigated area deserve all praise. But it is unreasonable to expect that the agricultural income should increase rapidly and keep pace with the growth of numbers.

The remedy lies in the development of non-agricultural sources of income. One is glad to note that Government have fully accepted the policy of developing India's industrial resources both by direct and indirect means and are giving effect to it.

In order to increase our non-agricultural income it is of the utmost importance that our industries should be modern-

ised. The charkha is no solution. There is of course no objection to the charkha for those who have nothing better to do, but in the face of the competition of imports, and of Indian mills, the charkha, economically speaking, will never pay. Hand-weaving is an important cottage industry and it will persist for a long time, but the hand-weaver is in much the same position as the hand-spinner. The growth of Indian mill competition, even if the volume of the imports of foreign cloth is steadily reduced, will adversely affect the hand-weaver, as it has done in the past. While cottage industries should not be neglected, it is obvious that in a country which is not isolated and in which prices of goods are determined by world conditions of manufacture under a competitive regime, cottage industries cannot be trusted to provide increasing employment on favourable terms for the population. I may quote here what I have written elsewhere in this connection:—

"Those of us who are opposed to Western industrialism and want India to pursue her ancient line of economic evolution, should remember two things: firstly, that an agricultural country means a poor country and that the growth of civilization with all that it implies depends upon the growth of town life, which, in its turn, depends upon the growth of industrialism; and secondly, that the days of India's economic isolation are long since over, and that international competition will force her, and is forcing her, to adopt Western methods of production, whether she likes it or not. The economic future of a great country cannot be based upon hand-weaving and hand-spinning, when other countries with which it competes have increased their productive power a thousand-fold by the use of complex machinery. It is also useful to remember that, as shown by the war, our banking and currency system, our credit organisation and our markets are bound by the closest ties with

those of other countries. The connection of India with the Western world is a fact of great economic importance. It is essentially wrong to think that methods of production and forms of economic organisation under which we prospered four hundred years ago are, for that reason, the most suitable to-day. The economic salvation of India lies in the gradual assimilation of what is best in Western industrialism and in the adoption of methods of production which universal experience has proved to be the most scientific and economical, and of forms of business organisation which would bring her more into line with Western countries." †

† Essays on Indian Economic Problems, pp.—33 34.

TABLE.

TABLE I.

Table showing the estimated Wealth and Annual Income of various countries at the out-break of War in 1914.

	National Capital.			National Income.		
	Approximation to accuracy Grade*	Amount in Million £	Amount per head of population. £	Approximation to accuracy Grade*	Amount in Million £	Amount per head of population. £
United Kingdom	I	14,500	318	I	2,250	50
United States	II	42,000	424	II	7,250	72
Germany	II	16,550	244	I	2,150	30
France	II	12,000	303	II	1,500	38
Italy	III	4,480	128	IV	800	23
Austria-Hungary	III	6,200	121	IV	1,100	21
Spain	IV	2,940	144	IV	230	11
Belgium	III	1,200	157	.....	.....	.....
Holland	III	1,050	167	.....	.....	.....
Russia	IV	12,000	85	.....	.....	.....
Sweden	III	940	168	.....	.....	.....
Norway	IV	220	90	.....	.....	.....
Denmark	IV	500	176	.....	.....	.....
Switzerland	IV	800	205	.....	.....	.....
Australia	I	1,530	318	I	258	54
Canada	II	2,285	300	IV	300	40
Japan	IV	2,400	44	III	325	6
Argentine	III	2,400	340	.....	.....	.....

* Grade I. Estimate is not likely to be inaccurate to a greater extent than 10 per cent.
" II. " " " " 20 per cent.
" III. " " " " 30 per cent.
" IV. Estimate may be inaccurate to a greater extent than 40 per cent.

J. R. S. S. July 1919, p. 491.

TABLE II.

Family Budgets (Bombay Presidency).

Annual Net Income by Classes (actual figures).

[The unit is the family—and income means net *per capita* income of family. Net means after deducting business expenses. *Per capita* means total income divided by the number of persons in the family without distinction of age and sex.]

Class of *per capita* income.			*Natural Divisions.*				
			Gujrat.	Konkan	Deccan.	Karnatak.	Sind.
		Total families examined.—	1,387	728	1,309	1,320	1,267
Class.		Rs.					
I	..	0—25	12	99	32	40	8
II	..	25—50	159	235	213	172	99
III	..	50—75	327	129	311	320	175
IV	..	75—125	441	111	329	377	321
V	..	125—175	218	58	151	154	226
VI	..	175—225	83	26	97	72	138
VII	..	225—275	57	13	52	55	86
VIII	..	275—325	27	12	29	28	61
IX	..	325—375	16	17	21	24	37
X	..	375—425	15	9	17	16	31
XI	..	425—475	2	4	8	13	17
XII	..	475—525	13	3	8	12	15
XIII	..	525—575	1	2	2	6	2
XIV	..	575—625	7	1	12	4	11
XV	..	625—675	1	2	6	3	3
XVI	..	675—725	.....	2	1	1	3
XVII	..	725—775	1	1	1	5	3
XVIII	..	775 and over	7	4	19	18	31

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TABLE III.

Index Numbers showing Variations in Wages.

	1913	*1921*
Postal runners	100	184.4
Postmen	100	891.7
Monthly wages at certain stations on the East Indian Railway:	*1913*	*1922*
(1) *Mirzapur.*		
Skilled labour	100	172.8
Unskilled labour	100	218.2
(2) *Cawnpore.*		
Skilled labour	100	164.7
Unskilled labour	100	218.2
(3) *Delhi.*		
Skilled labour	100	156.7
Unskilled labour	100	226.1
Monthly wages of the largest classes of labour in the North-Western Railway Locomotive Workshops, *Lahore,*		
Skilled	100	213.4
Unskilled	100	181.1
Daily wages on the Orissa Canals:		
(*a*) *Mahanadi Division:*		
Skilled	100	161.7
Unskilled	100	130.7
(*b*) *Bahmani Baitarni Division:*		
Skilled	100	193.2
Unskilled	100	175.6
Wages in Selected Industries.		
1. A Paper Mill, Bengal	100	153.4
2. Murree Brewery, Punjab	100	188.7
3. British Indian Steam Navigation Co.	100	172.1
4. An engineering workshop in the United Provinces:		
Skilled	100	137.9
Unskilled	100	175.5
5. Army Boot Factory, Cawnpore	100	155.5
6. A woollen mill in Northern India:		
Skilled	100	193.8
Unskilled	100	156.0
7. Manakjee Petit (cotton) Mills, Bombay	100	129.7
8. A jute mill in Bengal:		
Weekly wages	100	160.0
Daily wages (mistries and coolies)	100	144.6
9. Rice Mill, Rangoon	100	118.6
10. Monthly wages of the permanent Establishment at the Harness and Saddlery Factory, Cawnpore. The rates are fixed and pensionable. There has been no change since 1897-98, and in the case of some classes of workmen, since 1879-80.		

TABLE IV.

Average monthly wages in the Tea Gardens in Assam during the year 1913-14 and from 1917-18 to 1920-21.

	1913-14	1917-18	1918-19	1919-20	1920-21
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Act Labourers:					
Men . .	5 11 5	8 1 6	8 10 11	. .	. .
Women . .	5 5 9	7 9 5	8 13 2	. .	. .
Non-Act Coolies:					
Men . .	6 1 3	6 4 3	6 5 9	6 12 10	7 0 9
Women . .	4 11 5	5 1 2	5 1 5	5 14 3	5 12 7
Children . .	2 13 7	2 13 5	3 1 5	3 7 7	3 7 10

TABLE V.

Average wages (in Rs.) of a miner at the mines of a coal company at Raneeganj, Bengal.

	Average total earnings per day.	Average per month on the basis of No. of working days.
1913	.4	11.2
1914	.4	11.2
1915	.43	12.47
1916	.5	12.5
1917	.5	13.5
1918	.6	16.2
1919	.56	14.56
1920	.59	14.16
1921	.77	18.48
1922	.76	19

TABLE VI.

Cost of Living Index Numbers for India (Bombay) for Food, Fuel, Light, Clothing and Rent.
Average percentage increase over July 1914.

	1918	1919	1920	1921	1922	1923	1924
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
January . .	34	82	83	69	73	56	58
February . .	34	76	81	62	65	55	56
March . .	36	72	77	60	65	54	53
April . .	44	67	72	60	62	55	50
May . .	47	68	73	67	63	53	50
June . .	48	74	81	73	63	51	53
July . .	49	86	90	77	65	53	56
August . .	53	79	91	80	64	54	60
September . .	65	72	92	85	65	54	60
October . .	75	74	93	83	62	52	60
November . .	75	73	86	82	60	53	61
December . .	83	74	81	79	61	57	60
Yearly Average . .	54	75	83	73	64	54	56

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