

Scottish Geographical Magazine

Publication details, including instructions for authors
and subscription information:

<http://www.tandfonline.com/loi/rsgj19>

Malthus and some recent census returns

George G. Chisholm M.A. B.Sc. ^a

^a University of Edinburgh

Published online: 30 Jan 2008.

To cite this article: George G. Chisholm M.A. B.Sc. (1913) Malthus and some recent census returns, *Scottish Geographical Magazine*, 29:9, 453-471, DOI: [10.1080/14702541308541544](https://doi.org/10.1080/14702541308541544)

To link to this article: <http://dx.doi.org/10.1080/14702541308541544>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

THE SCOTTISH GEOGRAPHICAL MAGAZINE.

MALTHUS AND SOME RECENT CENSUS RETURNS.¹

By GEORGE G. CHISHOLM, M.A., B.Sc.,
Lecturer on Geography in the University of Edinburgh.

(*With Plate.*)

WHEN you did me the honour to invite me to lecture to your Section of the Royal Philosophical Society of Glasgow, I suggested as a subject the "Scottish Census of 1911," because I happened to be then engaged in the examination of the preliminary report of that census with a view to the preparation of some brief notes to accompany a map of the density of the population of Scotland, compiled by the Edinburgh Geographical Institute to illustrate the returns. Your council was good enough to accept that suggestion, but on proceeding to prepare my paper I found that I had planned it on so large a scale that all I could get within the limits of an hour is more suited to the title now adopted. The brief notes referred to appeared in the September number of the *Scottish Geographical Magazine* for 1911. The details there given showed that during the last intercensal period the growth of population in different parts of Scotland had been due principally to the influence of mining and fisheries, and that almost the only other causes of growth indicated were commerce and manufactures, and the attractions of health and pleasure resorts. The total population showed a reduction in the rate of increase as compared with the previous census from 11·1 to 6·4 per cent.

¹ A lecture delivered to the Royal Philosophical Society of Glasgow, and reprinted by permission from the *Bulletin* of the Geographical Society of Philadelphia, January 1913.

Some of these results, especially the diminished rate of increase of the total population, when first published, were received with a certain amount of disappointment and even dismay, not unmingled with hints that somebody or some class was to blame. And I propose, in the remainder of this paper, to consider how far these feelings are justified.

The cause of the disappointment is, no doubt, to be found in the fact that economic prosperity is almost universally believed to be an unquestionable good, and that a rapidly increasing population is an unmistakable sign of economic prosperity. This latter is an idea not confined to the man in the street, but occurs again and again in the writings of those who have considered the subject of population, from Malthus downwards. In the first edition of his *Essay on the Principle of Population*, Malthus says :¹ "There is not a truer criterion of the happiness and innocence of the people than the rapidity of their increase" (a statement that certainly goes far beyond the evidence that he has there adduced). And again : "The happiness of a country does not depend, absolutely, upon its poverty, or its riches, upon its youth, or its age, upon its being thinly, or fully inhabited, but upon the rapidity with which it is increasing."² And in our own times we have Sir Athelstane Baines stating in the article on population in the new edition of the *Encyclopædia Britannica* that "an increasing population is one of the most certain signs of the well-being of a community."

I am myself disposed to think, however, that if these statements are to be accepted, a very peculiar meaning must be given to the term "prosperous." It seems to be generally admitted that Ireland is, at the present time, one of the most prosperous parts of the British Isles, and yet there the population is still decreasing, and the birth-rate is the lowest of the four countries making up the United Kingdom. On the other hand, Russia seems to be the most striking example of a country with a rapidly increasing population. Taking the estimates of population for Russia given in the *Statesman's Year Book* for 1907, and comparing those with the Census returns of 1897, we find that population seems to have increased at the average rate of 1.67 per cent. per annum. And yet a Russian writer tells us "the general impoverishment of the Russian peasantry leaps to the eyes. If we ask ourselves how the peasant is fed, we find that the diet of himself and his family includes neither flesh, nor milk, nor eggs ; he eats only rye bread, and often not even that, with the addition of, at most, cabbage soup and weak brick tea."³ All that I can admit to be certainly shown by an increasing population is that the conditions are such as to allow of the population multiplying in the circumstances in which they are willing to live and increase, which, I grant, is not admitting very much. It is an admission on all-fours with the statement that opium sends to sleep because it has a soporific virtue.

And with reference to the first of the authorities I have cited as to this idea of the relation between prosperity and an increasing population,

¹ P. 108.

² P. 137.

³ Quoted in Andree's *Geographie des Welthandels*, 2nd ed., vol. i. p. 880, from Annenski's *Needs of the Village Communes*.

Malthus, I must point out that, so far as I am aware, the statements quoted belong only to the first edition of his *Essay*, and reconsideration led to their disappearance. In the third edition the paragraph, containing the first of the passages quoted from him, disappears altogether and the second is modified into this, "Other circumstances being the same it may be affirmed, that countries are populous according to the quantity of human food which they produce, or can acquire; and happy, according to the liberality with which this food is divided, or the quantity which a day's labour will purchase,"¹ a statement that seems to me much more satisfactory. I should add, too, that even the first edition shows the interpretation which was to be put on the statement made therein as to the happiness of a country depending upon the rapidity with which it is increasing inasmuch as he adds as an equivalent, "upon the degree in which the yearly increase of food approaches to the yearly increase of unrestricted population." That is, he looked upon the rapid increase of population merely as implying a rapid increase in the food supply, and this he took as a sign of the happiness of the population. In the sixth edition, we have this view given more explicitly, where he asks "if anything could be more desirable than the most rapid increase of population unaccompanied by vice and misery."² Obviously, Malthus, referring to "happiness," means the presence of the material conditions necessary for happiness, which, he had no need to be reminded, is a very different thing from happiness itself.

Holding this view, therefore, Malthus was under no temptation to regard an increase of population under all circumstances as a sign of "happiness," and, as is well known, he did not so regard it, either at the time that he was writing the first or any of the subsequent editions of his well-known *Essay*, which has evoked as much subsidiary literature as Adam Smith's *Wealth of Nations* or Darwin's *Origin of Species*. That literature is still growing in amount, and it is still worth while to inquire whether the views which he actually held are sound, and if so, whether they warrant us in regarding with disappointment the returns of the last Scottish Census, and, in that case, how far, and in what manner the feeling is well grounded.

Now, there is one statement which Malthus regarded throughout as fundamental and to which, accordingly, he appears to have consistently adhered amid all the changes of the various editions, which, during his lifetime, followed the first *Essay* of 1798; the statement that, while population tended to increase in a geometrical, food tended to increase in only an arithmetical ratio. Yet this statement I cannot but look upon as purely fanciful, one to which, indeed, it is hardly possible to attach any definite meaning consistent with facts that Malthus well knew. What is the meaning of "tendency"? Language is full of figurative expressions and the word "tend" in English is entirely figurative, and the figure, in this case, is so clear as to seem to leave no possibility of mistake. "Tend" is literally "to stretch," and "stretch" suggests or even implies a resisting force. Any prevailing movement

¹ Vol. i. p. 71.

² Vol. ii. p. 450.

liable to counteraction thus naturally suggests the use of this metaphor. We do not say that the earth "tends" to move round the sun in an ellipse, but that it *does* so move; but we say that the snow on a mountain top *tends* to move downhill either as snow or ice, or that the dust of the desert *tends* to accumulate most deeply in the hollows, because, however much or often the wind may blow snow or dust upwards, gravity is always pulling it downwards. But, while the figure here is quite clear, I cannot imagine how any statement could be ventured on as to the precise degree or rate at which snow tends downwards or desert dust accumulates in hollows. We may also say that the earth, while it moves round the sun in an ellipse, "tends" to fall into the sun, and is only prevented from doing so by the counteracting tendency at each instant to fly off at a tangent; and, in this case, we may add that the tendency is to fall towards the sun at a rate corresponding to the law that the two masses attract one another with a force directly proportional to the mass, and inversely proportional to the square of the distance. Here we have an intelligible measure of a "tendency." What is meant is quite clear. It implies the statement of a universal law, whose operation can be fully overcome only by a force equal to that described as operating. But what parallel to this can we get in the statement of the law of population? Malthus shows us that, in fact, population increases in various cases at various rates—that, under very favourable circumstances, it can be shown to have doubled itself in even fifteen years; yet he does not take that as the rate at which it will double itself "if unchecked." He says we may safely assume from experience in the early years of the North American Colonies that, if unchecked, it will do so in twenty-five years—in any case, in a geometrical ratio, which must mean some definite ratio.

Well, let it be so. But what about food? Here we find no proviso "if unchecked," when he tells us that it will increase (of course, in any case, only through the labour of men) only in an arithmetical ratio. Yet he himself suggests a case in which it might be supposed that food would go on increasing at a geometrical ratio. He says, "when acre has been added to acre till all the fertile land is occupied"¹ a diminished rate of production must ensue, showing that, until then, he does not venture to make that assertion. Whether, therefore, it be population or food, we can imagine that, if the increase is unchecked (in which case we must take the term "unchecked," as applied to food production, to mean "not counteracted by greater hindrances to human labour") it might go on increasing at the same geometrical ratio.

But this objection to what Malthus puts forth as a fundamental fact, is, as regards the burden of his *Essay* merely trivial, superficial, inessential. The supposed fact about which he is so emphatic is not really fundamental. To make good his case, he was not required to show that population tends to increase in a geometrical and food in an arithmetical ratio. That way of putting the facts makes them, indeed, very plainly alarming, but his case would have been equally well estab-

¹ Third ed., vol. i. p. 8.

lished, if he could have shown that, while both population and food tend to increase at a geometrical ratio, population tends to increase at the rate of 2·5 per cent. per annum, food only at 2·4 per cent. per annum. The essential fact on which his case is built up is, indeed, stated in what follows after the words already quoted about the adding of acre to acre till all the fertile land is occupied. "The yearly increase of food must depend upon the melioration of the land already in possession. This is a stream, which, from the nature of all soils, instead of increasing, must be gradually diminishing. But population, could it be supplied with food, would go on with unexhausted vigour." This is nothing else than a statement of the law of diminishing returns, and it would have been better if Malthus had stated his case so, for his own statement of his case has led some people to suppose that he has been answered when some of the assertions made by him by way of corollary from his own way of stating his case have been proved to be wrong; as when it is shown that in certain cases, even in old countries, food supplies increase at an even more rapid rate than population. For instance, in a recent article on Japan, in the *Journal of the Royal Statistical Society*, there is a table showing that, if in the period 1888-92, population, and the production of rice, barley, wheat, and rye in the aggregate, in that country, be both taken at 100, in 1903-07 population had risen to 117·8, whereas the production of the cereals mentioned had increased to 120·8. It is notorious too that, in the latter part of the nineteenth century, at any rate, the food supply of the civilised countries of western Europe did actually increase at a more rapid rate than the population.

The fact to which Malthus draws attention had been recognised by others, as he well knew, again and again in many places from ancient times downwards. It was, in many cases, too obvious to be overlooked that increasing numbers might gradually increase the difficulty of providing food for the population. The merit of Malthus, and it seems to me to be a merit that cannot be questioned, was to call attention to and insist upon the universal importance of the relation between numbers and food supply to the wellbeing of the people. He adduced ample evidence to show that almost everywhere and at all times, population was pressing upon certain barriers, by the removal of which, it would be sure to increase at a more rapid rate than that actually observed. And he pointed out the nature of those barriers and showed how they operated in different cases.

But, in doing this, he came to differ from himself. While what seems to me the futile contention that population tends to increase in a geometrical and food only in an arithmetical ratio, runs through all the editions of the *Essay*, the first edition, as is well known, differs in a very important point from all the subsequent ones, with the result that the later editions take a quite opposite view of the possibilities of ameliorating the condition of the poorer classes of the people to that taken in the first. The first edition takes the view that all the checks that keep the actual population within the limits of the food supply, which, of course, it cannot pass beyond, may be reduced to the two heads "vice" and "misery," and that hence any permanent melioration

of the condition of the poorer classes, that is, of the great bulk of the community, is impossible. In the second and subsequent editions, however, he enumerates three checks to the undue increase of population, vice, misery, and moral restraint, and much space is devoted in these later editions to insisting on the importance which ought to be given to this last check, and to picture the improvements that might ensue from the more extended operation of this check as compared with the other two.

It is true that in the first edition he did not altogether overlook this third check. As he himself says, he had observed that, if some check to population must exist, it was better that this check should arise from a foresight of the difficulties attending a family and the fear of impending poverty, than from the actual presence of want and sickness.¹ But, in the first edition, he had classed this check, rather curiously perhaps, under the head of "misery."²

It is right, however, that we should take the second thoughts of Malthus on this subject and, if we do so, it seems to me that the whole of human history since his day has been such as to confirm his doctrines and to bring into relief their supreme importance,—the doctrines that population in its increase is always held back by certain barriers, that the checks which keep the population within those barriers may be classed as "vice," "misery," and "moral restraint," that population increases with greater or less rapidity when these barriers are pushed back, and with very remarkable rapidity, when they are almost entirely removed³ (of their entire removal there is probably no example in history); that with like rapidity even old states recover from the ravages of war, pestilence, famine, or the convulsions of nature,⁴ that the operations of these checks is not deferred till the world is filled up—a contingency that all writers on population recognise as an inevitable, though remote event—but "has existed in most countries ever since we have had any histories of mankind, and continues to exist at the present moment";⁵ and that the only hope of the permanent amelioration of the condition of the bulk of mankind lies in the extension of the operation of the checks which come under the head of moral restraint. Some of his corollaries are also strikingly confirmed, as, that it is impossible to argue any future rate of increase from a present rate; that, as to America, we may be "perfectly sure, that population will not long continue to increase with the same rapidity as it did then"⁶ that, even in a well-governed state, disastrous results may ensue from a sudden cessation of an extraordinary stimulus to wealth and population;⁷ that those who live in the most frugal way are the nearest to a great disaster, and that where the great mass of the industry of a country is directed to the land, there may be, according to circumstances, instances in which the poor are in the best state, as well as others in which they

¹ Sixth ed., vol. ii. p. 256, apparently referring to first ed., p. 62.

² P. 108.

³ First ed., p. 101.

⁴ *Ibid.*, p. 109.

⁵ Sixth ed., vol. ii. p. 7.

⁶ First ed., p. 343.

⁷ Sixth ed., vol. ii. pp. 329-31.

are in the worst state.¹ But, in spite of all these dismal forecasts, you may recognise that he was also right in foreseeing the possibility of a great increase of population in Great Britain, with greater comfort than was enjoyed by the mass of the people in his time.²

Let us consider some of these propositions individually. Malthus tells us that "under a government constructed upon the best and purest principles, and executed by men of the highest talents and integrity, the most squalid poverty and wretchedness might universally prevail from an inattention to the prudential check to population."³ One knows not where to find a government which will meet the conditions which Malthus here sets down, but we may, I think, take the testimony of various enlightened foreign critics as proving that the British government of India is, at least, of a relatively high degree of excellence; and it is true that in quite recent years we have heard little of famine in India. Sir Theodore Morison, indeed, tells us that "the term 'famine,' which is still applied in India to a harvest failure, is now an anachronism and a misnomer. The true meaning of the word 'famine' according to the Oxford Dictionary is 'extreme and general scarcity of food.' This phenomenon has entirely passed away. Widespread death from starvation, which this word may be held to connote, has also ceased. . . . 'Famine' now means a prolonged period of unemployment, accompanied by dear food, and this is undoubtedly an economic calamity, which inflicts great hardship upon the working classes in India, as it would in any country."⁴ Still, if this picture represents the truth now, we must remember that it is not very long since it was not true.

TABLE I.
POPULATION OF INDIA.

	Population, Millions.		Variation, per Cent.	
	1901.	1911.	1901-1911.	Per Ann.
Bengal,	50·7	52·7	+ 3·8	+ 0·38
Bombay,	15·3	16·1	+ 5·2	+ 0·51
Burma,	10·5	12·1	+ 14·9	+ 1·40
Central Province and Berar, .	12·0	13·9	+ 16·3	+ 1·52
Madras,	38·2	41·4	+ 8·3	+ 0·80
North-west Frontier Province,	2·0	2·2	+ 7·5	+ 0·73
Punjab,	20·3	20·0	- 1·8	- 0·18
Sind,	3·2	3·5	+ 9·4	+ 0·91
Agra,	34·8	34·6	- 0·7	- 0·07
Oudh,	12·	12·6	- 2·1	- 0·21
Central India Agency, . .	8·5	9·4	+ 10·0	+ 0·96
Central Provinces States, .	1·6	2·1	+ 29·8	+ 2·64

¹ Sixth ed., vol. ii. p. 119.

² *Ibid.*, vol. ii. p. 293.

³ *Ibid.*, vol. ii. p. 323.

⁴ *The Economic Transition in India*, pp. 120-1.

Even the figures of the last census, when examined in the light of recent history, bear testimony to the efficiency of famine, with its attendants, disease and pestilence, in putting a check on the growth of population, and then afterwards allowing it to grow again with renewed rapidity. The accompanying table gives some examples of the differences in the movement of population in some of the provinces of India, in all cases according to the present area of those provinces, between 1901-11; and the ratio of increase, it will be observed, differed very greatly, there being, in some cases, actual decrease. The decrease in the Punjab is worth inquiry inasmuch as it is a large and populous province, and one in which the growth of population has been favoured in recent years by the construction of irrigation canals.

"The Chenab and Jehlum canals, by rendering cultivable vast areas of waste, have been of incalculable help in reducing the pressure on the soil in the most thickly populated districts, and in increasing the productive power of the province. . . .

"Of recent years the immediate effects of scarcity on the population of the province have been practically negligible. The famine of 1899-1900, the most severe since annexation, affected the health of the people, so that many were unable to withstand disease which under more favourable circumstances might not have proved fatal. . . .

"Whether it will ever be possible to render the Punjab free from liability to famine is a difficult question at present to answer. . . .

"During famine cholera is most to be feared; but when famine ceases, after a plentiful monsoon, malaria, acting on a people whose vitality has been reduced by privation, claims a long tale of victims."¹

And from the last "Moral and Material Progress of India," we learn that the average death-rate in the province in 1908 was 50·7, against a birth-rate of 41·8, followed in 1909 by a decline in the birth-rate to 35·1, with the explanation that this decline in the birth-rate was due to the fact that the people suffered severely from an epidemic of malaria in the autumn of 1908.

By way of contrast we may take the population of the Central Provinces and Berar, which showed the largest increase in population between the dates of the last two censuses. On inquiry into this case, we find that the high rate of increase expressed, in a large measure, rapid recovery from previous decline due to famine and disease. The decrease in Berar, shown in the census of 1901, was due to the famines of 1896-1897 and 1899-1900, and to the abnormally high mortality from disease in 1894-97, and in 1900. In the ten years preceding 1901, there was but one year which could be described as very favourable, and even then the rabi crops partially failed. We are also told that, between 1881-91, the population deduced from the vital statistics of the Central Provinces, when compared with those of the census returns, differed by only 50,000, while, in 1901, the corresponding difference amounted to 450,000. This, it is added, may be partly accounted for by emigration, but was mainly due to the deficient reporting of deaths

¹ *Imperial Gazetteer of India*, new edition, vol. xx. pp. 330-31.

in famine years. Other similar testimony is given in the *Gazetteer*. The population of these territories had decreased from 13·06 millions in 1891, to 11·99 millions (a decline of almost exactly a million) in 1901, when it was brought back to exactly the same figures as in 1881, so that the average rate of increase between 1891-1911 is equal to only 0·32 per cent. per annum.

On the other hand, the large increase in the case of Burma is quite normal. For Burma, as a whole, we cannot make comparisons going far back, but the rate of increase of population for 1901-11, given in the table, corresponds to an average increase of 1·42 per cent. per annum, which may be compared with the successive rates for Lower Burma according to the results of the censuses of 1872, 1881, 1891, and 1901, which are 3·48, 2·43, and 1·94 per cent. per annum, respectively. But here we have to do with a province which suffered from hundreds of years of misgovernment before it came into British possession, in consequence of which, when good government was established, there was plenty of cheap land to be had and the vast resources of the country came to be developed with great rapidity.

Let us now consider another country, the conditions of which are more similar to those in Scotland. The accompanying table shows for successive, but unequal periods, the rate of increase in Germany, and that of Scotland as a whole, the figures for Germany being, even in 1840, those for the present area of the German Empire. To make the figures for the two countries comparable, the rate of increase has, in every case, been expressed as the average rate of increase per cent. per annum.

TABLE II.

POPULATION OF GERMANY IN MILLIONS. INCREASE OF POPULATION PER CENT. PER ANNUM IN GERMANY AND SCOTLAND.

Germany.			Scotland.	
Year.	Population.	Increase.	Year.	Increase.
			1801-11	1·14
			1811-21	1·48
			1821-31	1·23
			1831-41	1·03
1840	32·8		1841-51	0·95
			1851-61	0·60
1871	41·1	0·72	1861-71	0·93
1885	46·9	0·95	1871-81	1·07
1890	49·4	1·06	1881-91	0·75
1900	56·4	1·32	1891-1901	1·06
1910	64·9	1·43	1901-11	0·62

With reference to these tables, I may point out first, that either of them may be taken as proving the observation of Malthus that it is impossible to argue the future rate of increase from the present, for both show that

the rate fluctuates from period to period. This may seem too familiar to need pointing out at all, and yet we find a distinguished French statistician, Mr. A. de Foville, comparing France with Germany, stating without qualification that it is probable that at the end of the present century, Germany will have a population of 120 millions or more, while France will not have 60 millions! If this forecast of Mr. de Foville as to the population of Germany at the end of the twentieth century proves to be fulfilled, it will be one of the most surprising things that that century will have to show. It is all the more remarkable that Mr. de Foville should have made this observation inasmuch as he makes it in an article¹ in which he is reviewing, not with disfavour, a forecast, by a Danish statistician, Professor Westergaard, of a totally different nature, Professor Westergaard anticipating that a conspicuous decline of the birth-rate will, by and by, appear in all civilised countries, that the growth of large European towns which was so marked a feature of the nineteenth century will be followed by a cessation of their growth, and an increase of population in the rural districts and the smaller towns of those districts.

Next, one may note that it is only since the latter part of last century that Germany has come to show any high rate of increase as compared with that of Scotland. Down to 1901, the rate of increase of population in Scotland was only once lower than the average in Germany between 1840-1871. It is true that the latter census was taken in a year when the increase of population must have been checked considerably by war; but, even making allowance for that, the calculated rate for the long period 1840-1871 must still have been a low one. I would lay special emphasis on this fact. It seems to show that the population in Germany was then pressing pretty severely against some barrier to its increase, and no very recondite investigation is required to reveal what that barrier was. At that time, the agriculture of the country was in a very backward condition, and the means of communication, especially by rail, very defective, and for the improvement of agricultural production better means of communication were absolutely necessary. But this was a barrier very easy to push back, once the modern methods, already widely in use in other countries, came to be applied, and they were pushed back all the more rapidly in consequence of the fact that Germany is rich in material resources for industrial development. Then the agricultural and manufacturing industries stimulated one another to such a degree that the average rate of increase has not merely been higher than Scotland has ever recorded, but higher for a decennial period than England (exclusive of Wales) has ever reached since 1821-31. Even for a quinquennial period, it may be mentioned, Germany has never attained the average reached by England (exclusive of Wales) in 1811-21 (1.68 per cent. per annum), and latterly the quinquennial censuses have been showing a declining rate.

And, unquestionably, the population in Germany, as in every other country, has throughout been more or less kept down by misery and vice, but, when one considers that the period for which quinquennial averages are given is one in which the death-rate had been going down,

¹ *Économiste français*, 30 November, 1907.

I think that we are safe in assuming that these checks have not been operating in an increasing proportion, and that the checks that have determined the fluctuations, have been chiefly those which have come under the head of "moral restraint." And what is true of Germany is true also of Scotland, with this geographical difference, that the growth of Scottish mining and manufactures is to a much less extent a stimulus to Scottish agriculture, than corresponding conditions are to that of Germany.

TABLE III.

GERMANY. INCREASE OF POPULATION PER CENT. PER ANNUM.

	1840-71.	1871-85.	1885-90.	1890-1900.	1900-10.
Prussia	0·87	1·00	1·11	1·98	1·54
East Prussia	0·89	0·52	—0·02	0·19	0·23
Brandenburg	1·40	1·77	2·41	1·95	2·12
Schleswig-Holstein	0·60	1·04	1·18	1·30	1·56
Westphalia	0·81	1·57	1·93	2·76	2·61
Hesse-Nassau	0·32	0·93	0·87	1·32	1·58
Rhine Province.	1·03	1·40	1·61	2·03	2·14
Bavaria	0·36	0·80	0·62	1·00	1·08
Saxony	1·30	1·59	1·91	1·84	1·35
Württemberg	0·32	0·67	0·40	0·63	1·17
Baden	0·39	0·66	0·68	1·20	1·38
Hesse	0·30	0·83	0·73	1·21	1·36
Mecklenburg-Schwerin	0·39	0·23	0·09	0·51	0·51
Alsace-Lorraine	0·10	0·07	0·48	0·69	0·86
German Empire	0·72	0·95	1·06	1·32	1·43

Similar results are reached when we look into details. Here are some rates of increase of population in recent periods for different parts of Germany. Geographical conditions in relation to the present state of industry here also obviously have an important influence on the rate of increase, and the differences are not unlike those which we find in Scotland. The lowest rates of increase, at least in recent years, are shown in the agricultural provinces of East Prussia and Mecklenburg-Schwerin. In one of these, you will notice, the rate is quite insignificant, and in one period there was even a decline. Notwithstanding the great improvement that has gone on in German agriculture, and a great increase in the number of the population employed in agriculture, there has been, as in Scotland and England, an actual decline of population in many of the rural districts of Germany. What is called a "landflight" in Germany is known there just as it is here. It is not very wonderful, for in old countries improvement in agriculture means in a large measure the substitution of machinery for men, as in a new country it means in a large measure the addition of men to machinery. And in this connection, returning again to Mr. de Foville's anticipation as to the population of Germany at the end of the twentieth century, I may mention that, while a slackening of the birth-rate in the towns of Germany has, for some years, been subject for remark, the diminished fruitfulness of marriages

in the country districts of Germany is now beginning to attract attention. It is the subject of an article in the *Zeitschrift für Socialwissenschaft* for December of last year. The really high rates of increase, amounting to a maximum of 2·76, are in the mining and manufacturing provinces of Westphalia and the Rhine. The other great manufacturing region, the kingdom of Saxony, it will be noted, has never shown so rapid a rate of increase as the two others have since 1890, and Saxony since the period 1885-90 has shown a declining rate of increase.

In comparing Scottish counties with German provinces we are indeed comparing small things with great, still the comparison is not uninteresting. To facilitate that comparison, the accompanying diagram, for the idea, as well as for the preparation of which, I am indebted to my university assistant, Miss A. B. Lennie, M.A., B.Sc., has been drawn up. Looking at this diagram, we may notice a regular decline in the rate of increase of population in most of the non-manufacturing counties since 1871, but the great majority of those counties reached their maximum rate in the period 1861-71 or before it. But some of the non-manufacturing counties, Elgin, Banff, and Kincardineshire, have maintained the same increase to the end, probably, as already stated, through the development of the fishing industry. Special comment may be made on two counties, Argyllshire and Perthshire, whose decline began specially early, in both cases in the period 1831-41, and two, which show specially notable advances, Fife, in which there was on the whole a declining rate from 1851 to 1861, when the rate was only ·08 per cent. and then a steady, and, even latterly, rapid rise to 22·3 per cent. in 1901-11, and Selkirk, which showed a rapid increase in the two periods, 1861-71 and 1871-81. In the case of Argyllshire, there probably can be little doubt that what brought about the early decline of population was the rapid growth of the city of Glasgow, which, of course, attracted population from many parts, and no county was more favourably situated for supplying a population than the county of Argyll. In Perthshire, we probably see the result of a similar attraction due to the growth of the manufacturing towns of Dundee and Arbroath. As for the peculiarly rapid growth of Selkirkshire, culminating in the period 1871-81, it is necessary to note that this growth is almost entirely confined to the manufacturing towns, Galashiels accounting for the greater part of it. In the table in the census report, the increase of population for that county is represented as having been as much as 82½ per cent., but this arises from the inclusion of the Roxburghshire portion of Galashiels in the county of Selkirk in the population of 1881, but not in the population of 1871. In the diagram, for the sake of making the comparison more instructive, the population of that part of Galashiels that lies upon the left bank of the Gala, has been included in the Selkirkshire portion and not that of the county of Roxburgh, from 1861 onwards. Even then, a rapid increase is noted in the two periods, to which attention has just been called; and the explanation of that rapid increase is not to be found in this county any more than in any other county in any growth of the rural population, but solely in the fact that there was a very steady advance in the woollen industries of the Scottish

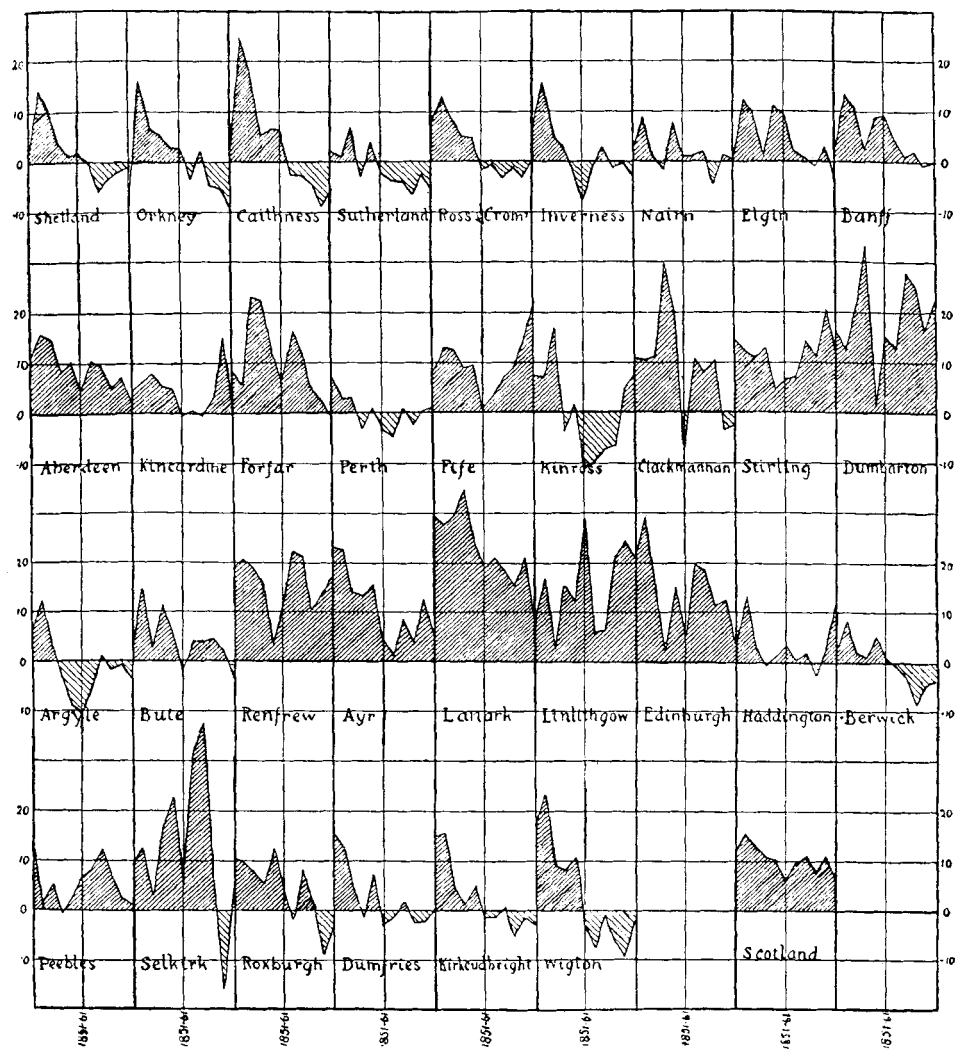


Diagram showing changes in Rate of Increase of Population in Counties of Scotland.

borders generally, down to the date 1872, which was the culminating year as regards the quantity of goods produced. There can be little doubt that the Franco-German war, which interfered with the industry of two of the most important woollen manufacturing countries on the continent of Europe, gave excessive temporary stimulus to that industry in this country, and, therefore, may be looked upon as a contributory cause of the slackening of the rate of increase and the decline which ultimately followed. The rapid and growing rate of increase of population in Fife since 1861 is a sign amongst other things of one way in which the recent prosperity of Germany has influenced this country. The growth of the mining industry in Fife is promoted in a large measure by the rapidly rising demand for coal in the Baltic as well as in other parts of Europe.

But with all that Malthus foresaw, there were certain important facts bearing upon the growth of population since his time which Malthus did not foresee, and could not possibly have foreseen. No more than Adam Smith did Malthus foresee the enormous revolution that was going to be wrought by railways. Unlike Adam Smith, he lived into the railway era. The last edition of his *Essay* was published in 1826, the year after the opening of the Stockton-Darlington line, which may be called the pioneer railway of the world. But neither railways nor steamships are mentioned by him, and, in any case, it was not to be expected that he would be able to foresee the marvellous degree to which railways have cheapened the carriage of produce as bulky as the most essential of our food-stuffs. He understood the manner in which commerce may put into the hands of the people in one country command of labour in other countries, but he could not foresee the extraordinary extent to which the accumulation of capital, and its investment in foreign countries, would give the inhabitants of one little country command of the labour of millions in the most distant regions of the world. But, if he could not foresee the way in which railways could make the plains of America available for the food-supplies of this country, it may be contended that he did foresee what would happen in America in such an event. "In a country," he says, "where there is an abundance of good land, where there are no difficulties in the way of its purchase and distribution and where there is a foreign vent for raw produce, both the profits of stock and the wages of labour will be high. These high profits and high wages, if habits of economy pretty generally prevail, will furnish the means of a rapid accumulation of capital, and a great and continued demand for labour, while the rapid increase of population which will ensue will maintain undiminished the demand for produce, and check the fall of profits. . . . America affords a practical instance of the agricultural system in a state, the most favourable to the condition of the labouring classes. . . . They have been able to command an unusual quantity of the necessaries of life, and the progress of population has been unusually rapid."¹ It is enough, perhaps, by way of comment upon this, to draw attention to the manner in which that is illustrated by the accompanying

¹ Sixth ed., vol. ii. pp. 119-21.

table, showing the rates of increase of population in different parts of the United States at different periods.

TABLE V.
UNITED STATES. POPULATION (IN MILLIONS) AND INCREASE
PER CENT. PER ANNUM.

Division.	1790.	1840.	1860.	1890.	1900.	1910.
1. N. Atlantic Div.	2.0	6.8	10.6	17.4	21.0	25.9
Rate of Incr.		2.50	2.27	1.67	1.92	2.08
2. S. Atlantic Div.	1.9	3.9	5.4	8.9	10.4	12.2
Rate of Incr.		1.52	1.57	1.69	1.66	1.56
3. N. Central Div.	—	3.3	9.1	22.4	26.3	29.9
Rate of Incr.		—	5.12	3.04	1.63	1.27
4. S. Central Div.	0.1	3.0	5.8	11.0	14.1	17.2
Rate of Incr.		—	—	2.17	2.34	2.02
5. Western Div.	—	—	0.6	3.0	4.1	6.8
Rate of Incr.		—	—	5.43	2.81	5.25
Total ¹	3.9	17.1	31.4	62.6	76.0	92.0
Rate of Increase		—	—	2.32	1.90	1.93

Even in Malthus's day this rapid increase of population depended upon the small amount of labour with which increased supplies of food could be produced, and, since his time, the application of machinery to food production has still further diminished, and that, in a great degree, the amount of labour required for production on the fields, while the improved means of transport has been reducing that amount as required for its production, in the sense in which that word is used by economists, on the markets of old countries across the ocean.

So far has this proceeded that there is a tendency to suppose that food production does not, in any way, act as a check upon the increase of population in old countries with an advanced industry; that for them there is sure to be enough, whatever countries go short. But to those who hold this view, Malthus would have pointed out, first, that home industry can give us the power of purchasing from abroad only in so far as we are able to sell abroad, and the extent of our sales, is, in the last resort, dependent upon the food supply somewhere. In years of famine, India can buy from us fewer cottons, and, as is well known, this great British industry, which, on the balance of years, is a very profitable one, is one that is characterised by marked fluctuations of profit and loss. A highly organised industry in an advanced manufacturing country gives employment to numbers of people with various degrees of ability and training and character, but, in the long run, the number of people for whom food, with a small surplus, is afforded in India, China, and other countries, is an important factor in determining how many of each grade can be employed in this country.

But, secondly, Malthus would have pointed out that, however favour-

¹ Exclusive of Alaska.

able conditions may be at any given time to the more extended utilisation of the food-producing areas of the world, these areas are, after all, as distinctly limited as those of any one country. The world is larger than our little island, but no more extensible. We are justified in arguing from what we see going on around us, that a time must come when the increase of food production all over the world will involve more labour, as it has come to do in one country after another. No doubt this result may be prevented by a variety of possibilities which we have no means of foreseeing, but it is only experience that can offer us probabilities.

A more plausible consideration is that the extension of the area of food supply has this effect at least, that so long as it continues to extend, it does not matter where industry is carried on. The products of industry will always ensure the supply of food and other necessities. Railways and steamships, we are told, have annihilated distance. But this epigrammatic way of expressing an unquestionably remarkable development of the means of transport in modern times is apt to be taken too literally. The truth is, that the local market is still a powerful factor in stimulating the growth of nearly all industries. It is, indeed, a truth that is apt to be overlooked at present owing to the way in which the growth of the world, as a whole, tends to conceal the degree in which our hold on foreign or rather external markets is getting encroached on by the more rapid growth of the home industries in those markets. In new countries, without doubt, there are great difficulties in the way of establishing manufacturing industries, and especially those which involve a high degree of organisation. The population is too scattered to form a sufficiently large local market; the supply of skilled labour is inadequate; capital is dear. But skilled labour becomes more plentiful and capital becomes cheaper, and the demand of the local market, which from the first counts for something, becomes steadily greater as population increases from natural causes. Besides, if it is of no moment where industry is carried on, provided people will only work, why have Distress Committees in Great Britain to make such reports as that "there are still, however, a very considerable number of willing and able workers who are unable to procure situations"?

In new countries, or at least in the new parts of new countries, this difficulty does not present itself. There the abundance of free land gives a value to mere manual labour which ensures to it a high degree of mobility, at least if the labourer is endowed with only a modicum of foresight. As a Winnipeg waiter, who, before he went out to Canada, earned fifteen shillings a week in one of the eastern counties of England, expressed it to me, "Now I can go where I like, east, west, north, or south," and the buoyancy of feeling revealed by this statement is what seems to be common to all the young and strong throughout the north-west of Canada.

It was considerations such as those above indicated that induced Malthus to declare himself no very determined friend to "trade and manufactures." But, in the later editions, while he elaborated, even more fully, his views as to the evils of manufactures, he lays great stress

on the fact that "manufactures, by inspiring a taste for comforts, tend to promote a favourable change in the [habits of the labouring poor], and in this way, perhaps, counterbalance all other disadvantages."¹ This is the point to which he again and again returns as that which is most likely to render generally operative the check of moral restraint, by which alone he looks forward to a general improvement in the condition of humanity as at least a possibility if not a probability. In one enumeration of the peculiar advantages of Great Britain, after mentioning the excellence of her soil, the comparative steadiness of her climate, the happiness of her insular situation, he adds as the last of those advantages, "above all, throughout a very large class of people, a decided taste for the conveniences and comforts of life, a strong desire of bettering their condition (that master-spring of public prosperity) and, in consequence, a most laudable spirit of industry and foresight are observed to prevail."² And with England he contrasts France, as to which he says, "With all her advantages of situation and climate, the tendency to population is so great, and the want of foresight among the lower classes of the people so remarkable, that, if poor-laws were established, the landed property would soon sink under the burden, and the wretchedness of the people at the same time but increase"³—another reminder of the impossibility of foreseeing a future rate of increase of population from the rate at any given time.

If Malthus had lived at the present day he would probably, in considering the unquestionable increase of economic wellbeing in the great bulk of the people in this country, have pointed out, that the tendency of legislation also had been, in some respects, to retard the rate of increase of the population. It is, perhaps, not without significance that Malthus speaks of a "standard of wretchedness"⁴ as placing a limit on the increase of population. Our phrase for the same thing is the "standard of living," apparently a recognition of the fact that such a standard has come to operate above the standard of wretchedness. Among the causes which have tended to raise that standard may be included, I think, the Factory Acts, as to the operation of which it is not impossible that both the supporters and opponents of those Acts were, in a measure, right, the supporters, in thinking that they would tend to raise the economic level of the workers, the opponents in thinking they would check, to some extent, the growth of British industries—a supposition not disproved by the very rapid expansion of those industries in spite of the Factory Acts.

The removal of the restrictions on the action of trade unions may be credited with the same tendencies, for, so far as union action is able to maintain a higher level of wages or better conditions of another kind, than would otherwise have obtained, it can only be, on the one hand, by restricting the supply of labour in a particular industry and, on the other hand, by compelling the leaders of industry to restrict their employment of capital to those branches of the industry in which higher

¹ Third ed., vol. ii. p. 206.

³ *Ibid.*, p. 348.

² Sixth ed., vol. ii. p. 346.

⁴ *Ibid.*, p. 359.

wages can be earned. The endeavours of trade unions to restrict the number of apprentices, and to drive non-unionists out of employment, are also conscious or unconscious efforts to keep up the standard by keeping down the numbers. Industries or branches of industry that do not come up to the British standard of living tend to die out. Probably the dominating tendency of the Education Acts in this connection also is to retard the growth of population through its effect on the standard of living, even though their effect in promoting industry and population, their necessity as a defence of industry in competition with other countries, can hardly be called in question. In making the suggestion of a possible retarding effect, ascribable, on the balance of tendencies, to our Education Acts, I shall probably be told, as we are so often nowadays told, whether appropriately or inappropriately, to look to the example of Germany. Germany, it will be said, is one of the best educated countries in the world, and has been in that position longer, perhaps, than any other country, and yet its population is still increasing with striking rapidity. True, but if I look at Germany, I should like to see, if I could, all the relevant facts, and I think, at least, that it is not irrelevant to refer once more to what I believe to be the fact, that one essential condition of the remarkably rapid advance that Germany has made since the early seventies of last century was the very backward state of German agriculture at that time.

I have wandered far away from Scotland, but, if I now return to our own country, I trust I shall be able to show that I have not wandered without reason. We have seen that elsewhere population increases or diminishes in different parts of the country, at varying rates, and that these rates depend, in the long run, on the extent of the food supply somewhere, and, directly, in civilised countries, to a large extent on the standard of living which the different classes endeavour to maintain. If the maintenance of this standard involves a diminished rate of increase of population, the fact that this is so is no doubt matter for regret, but it may be a matter for which no one is responsible. And, if it is so, I cannot say that I see anything to regret in the fact that that degree of moral restraint is observed which is necessary to maintain the standard. As things are, it would probably be easy enough for Scotland as a whole to recover the rate of increase which she showed between 1891 and 1901. Looking to the growing importance of the mining industry, one may say that a willingness on the part of the miners to accept 3d. a ton less wages would go a long way to bring that about, provided, of course, that there was a corresponding willingness in other branches of British industry, without which there could really be no such reduction in that of mining. There would then soon be an increased demand for Scottish coal, and an increased demand for labour, and that demand would, no doubt, speedily be supplied. But, if it were to be supplied in this way, I wonder whether there is any one here who would look upon that mode of increasing population with any degree of satisfaction. But there may be more wholesome means of increasing the population, possibly by the improvement of Scottish agriculture, and all, I should think, will be agreed that, if that could be done, without

lowering the standard of living for the classes concerned, it is much to be desired. Still, even with reference to this, it is important to bear in mind the fact mentioned by Malthus, that it is possible for an agricultural population to be in the worst state as well as in the best, and I may here point out that Malthus was one of those who foresaw the possibility of disaster in Ireland from an unrestrained increase of an agricultural population long before the famine took place. Referring to Arthur Young's project for improving the condition of the people by the more extended use of milk and potatoes in their diet, he says, "when, from the increasing population, and diminishing sources of subsistence, the average growth of potatoes was not more than the average consumption, a scarcity of potatoes would be, in every respect, as probable as a scarcity of wheat at present; and, when it did arrive, it would be beyond all comparison more dreadful"¹—a Cassandra prophecy uttered in 1826, leaving twenty years for scorn before its fulfilment. Indirectly, even more than directly, it may be also possible to promote the growth of a numerous, strong, and healthy population, by a scientific cultivation of forestry in Scotland, but, in any case, it appears to me that for the present day, as for the time when Malthus wrote, the sound conclusion is as he puts it: "It is clearly the duty of each individual not to marry till he has a prospect of supporting his children"; while, however, we add with him, that it is "at the same time to be wished that he should retain, undiminished, his desire of marriage, in order that he may exert himself to realize this prospect, and be stimulated to make provision for the support of greater numbers."²

Still, we cannot overlook the fact that, if the economic conditions, to which Malthus calls attention, do tend to bring about a healthy degree of moral restraint in the great bulk of the community, there is still a large section of the population in whom the motives that bring about moral restraint do not and, perhaps, in the present circumstances, cannot be expected to act. They are born and brought up in conditions which give them nothing to strive for, except, perhaps on the part of those who, even in such surroundings, may be endowed with exceptional force of character. With regard, also, to this section of the population, it seems to me that the problem is still as it was stated by Malthus: "How to provide for those who are in want, in such a manner as to prevent a continual increase of their numbers, and of the proportion which they bear to the whole society"³—not "how to provide in the cheapest and best manner for a given number of people. If this had been the sole question it would never have taken so many hundred years to resolve."⁴ And, probably, it is the most important result of the labours of that keen thinker, whose sympathy with the poor haunted him like a passion and governed the labour of his whole life, that that idea has, more or less, entered the minds of nearly all social reformers, whether they accept the doctrines of Malthus, or profess to denounce them. Whatever means can be taken that will answer to the "touchstone" of Malthus, that they shall tend to increase the foresight of the classes

¹ Sixth ed., vol. ii. p. 388.² *Ibid.*, p. 269.³ *Ibid.*, p. 395.⁴ *Ibid.*, p. 392.

concerned will be looked on with approval by all, but there still remains a large class, whom motives cannot reach, the feeble-minded, the hopelessly degenerate, the criminally idle; but with regard to these classes I will merely say that it is very significant that from so many sides, representing different tendencies of thought, the demand is daily becoming stronger that these classes should be isolated and not allowed to multiply to the detriment of the community.

GEOGRAPHY IN SCOTLAND SINCE 1889.

A REPORT PRESENTED TO THE TENTH INTERNATIONAL GEOGRAPHICAL CONGRESS AT ROME, MARCH-APRIL 1913.

By MARION I. NEWBIGIN, D.Sc., Editor of the *Scottish Geographical Magazine*.

IN the year 1889, Mr. A. Silva White, then Secretary of the Royal Scottish Geographical Society, and Editor of its *Magazine*, presented to the Fourth International Geographical Congress at Paris a *Report* on the Achievements of Scotsmen during the Nineteenth Century in the Fields of Geographical Exploration and Research (see *S.G.M.*, vol. v., p. 480 *et seq.*). This Report, covering as it did a period of nearly ninety years, was of a very comprehensive nature, and summarised the work of Scotsmen both at home and abroad. The present Report, which refers only to a period of some twenty-three years, and brings the previous one up to date, must necessarily be shorter.

We may note in the first instance that during this period geography has followed in Scotland much the same lines as in other countries. As, in broad outline, the surface of the globe, at least in lower latitudes, was tolerably well known before the beginning of the period, there has been, naturally, everywhere a diminution in the amount of exploration done. More attention has therefore been devoted to the detailed study of the homeland, and to the investigation of special problems relating to the geography of Scotland. Thus we have had, as will be noted directly, investigations of the Scottish Lochs, of the vegetation of the country, and so forth. In devoting special attention to such detailed problems Scotland has followed the example of other countries within recent years.

In the second place, in Scotland, as elsewhere, the fact that the land surfaces of the earth are now tolerably well known has led to an increasing concentration of attention upon the ocean, with the result that many papers have been published and many investigations conducted on problems connected with Oceanography.

Finally, as high latitudes constitute the least-known part of the surface, we find that Scotland has taken her full share in Polar Exploration during the last two decades.

Again, in Scotland, as elsewhere, great interest has been taken in