

A NOTE ON THE SERIES

These maps of Great Britain are produced in two sheets, are on the Transverse Mercator Projection, and carry the new National Grid lines at ten kilometre intervals.

The series was initiated at the suggestion of the Advisory Maps Committee of the Ministry of Works and Planning (later the Ministry of Town and Country Planning) whose members included representatives of the British Association National Atlas Committee.

The planning maps already published or in preparation on this scale have been sponsored by the Ministry of Town and Country Planning and the Department of Health for Scotland and form a related series depicting the primary physical, economic, human and social facts concerning the country as a whole. For convenience of reference, maps prepared independently by the Ministry of Agriculture, the Geological Survey and by research organisations such as the Land Utilisation Survey are included in the list below.

The series will be found valuable not only by those concerned with planning, but by all who wish to see in convenient form essential facts about Britain as a whole. They should be invaluable to schools, business men, and administrators, and constitute the nucleus of a National Atlas.



PLANNING MAPS

Published by the Ordnance Survey on a Scale of 1:625,000
or about 10 miles to one inch

Explanatory Texts

This series of Texts is issued by the Ministry of Town and Country Planning and the Department of Health for Scotland to assist in the interpretation of certain of the maps in this series

No. 3. POPULATION



Published by the Director-General at the Ordnance Survey Office,
Chessington, Surrey

1950

PRICE 9d. NET

Map. m. 455.41.

MAPS ALREADY PUBLISHED

	<i>Price per Sheet (flat)</i>	<i>s. d.</i>
Administrative Areas	5	0
Average Annual Rainfall	5	0
Base Map	2	0
Coal and Iron	5	0
Electricity—Statutory Supply Areas	5	0
Gas Board Areas—in accordance with the Gas Act, 1948	5	0
Iron and Steel	5	0
Land Classification	5	0
Land Utilisation	5	0
Population Density 1931	5	0
Population of Urban Areas 1938	5	0
Population—Total Changes 1921-31	5	0
Population—Total Changes 1931-38/39	5	0
Population—Changes by Migration 1921-31	5	0
Railways	5	0
Roads	2	6
(mounted and folded)	5	0
Solid Geology	12	6
(mounted and folded)	15	0
Topography	5	0
Types of Farming	5	0
Vegetation—The Grasslands of England and Wales	5	0

MAPS IN PREPARATION

- Drift Geology
- Economic Minerals :—
 - Igneous and Metamorphic Rocks
 - Limestone
 - Sandstone
 - Sand and Gravel
- Gas—Areas of Supply
- Physical Features
- Population—Changes by Migration
1931-38/39
- Vegetation—Reconnaissance Survey
of Scotland

EXPLANATORY TEXTS PUBLISHED OR IN PREPARATION

- Price 9d. each*
- No. 1 Land Classification
 - No. 2 Average Annual Rainfall
 - No. 3 Population
 - No. 4 Limestone
 - No. 5 Vegetation

POPULATION MAPS OF GREAT BRITAIN

SCALE 1 : 625,000
(about Ten Miles to One Inch)

WITH THE NATIONAL GRID

EACH MAP ISSUED IN TWO SHEETS

SHEET 1
Scotland and England—north of Kendal

SHEET 2
Remainder of England and Wales

*Published in colour
by the Director General, Ordnance Survey*

Price 5s. net per sheet

Printed in colours, paper, flat

Introductory

EIGHT population maps are included in the 1/625,000 series of Planning maps. Two of these show a static position and give a general picture of population distribution, while six show the changes in population which have taken place over three consecutive periods. These maps are respectively :—

Population Density 1931.

Population of Urban Areas 1938.

Population Total Changes 1921-31.

Population Changes by Migration 1921-31.

Population Total Changes 1931-38/39.

Population Changes by Migration 1931-38/39.

*Population Total Changes 1938/39-47.

*Population Changes by Migration 1938/39-47.

This pamphlet gives a short description of each of these maps, including sources of data and methods of compilation.

*These maps are in preparation

Population Density 1931

The map of population density shows at once the salient facts of population distribution. The concentration of the people in great conurbations or smaller urban groups is clearly illustrated, so that it becomes easy to appreciate the fact that 80 per cent of the population of England and Wales lives in boroughs and urban districts and nearly 70 per cent of the population of Scotland lives in burghs. Reference to other maps in the 1/625,000 series, such as that of Land Classification, illustrates the association in the rural areas between population density and the quality of the land, such areas of poor quality land as the Breckland and Downland supporting only a sparse rural population. In Scotland the concentration of the population in the Central Lowlands contrasts markedly with the large uninhabited areas of mountain and moor in the Highlands.

Source and Style of the Map

The map was compiled from the 1931 County Census Volumes of the Registrars General, from the 1/1,000,000 Ordnance Survey Map "Population of Great Britain 1931" and from the Ordnance Survey topographical maps. The Ordnance Survey 1/1,000,000 map shows the density of population by twelve colour tints, representing densities of from 0.1 persons per square mile to 76,800 persons and over per square mile. On the 1/625,000 map the number of classes is reduced to six, representing the following densities:—

Description	Density of Population	
	Per Sq. Mile	Per Acre
Virtually uninhabited	0— 1	0— .002
Sparse Rural ...	1— 50	.002— .08
Dense Rural ...	50— 400	.08 — .625
Sub-urban and industrial rural	400— 6,400	.625— 10
Urban ...	6,400—25,000	10 — 39
Dense urban ...	25,00 and over	39 and over

The 1931 Census statistics were used in the compilation of this map, since these are the most recent statistics available which give reliable details of the populations of Civil Parishes and Wards. These statistics are in respect of the population enumerated at midnight 26th/27th April, 1931. Any difference between the enumerated and the resident population become insignificant when the figures are translated into broad density classes. The statistics used may be found in the County Census Reports, with special reference for England and Wales to Part I, Table 3, Column *g*, "Persons per acre", and for Scotland to Part I, Table I, column *q*, "Population (1931) per 100 acres".

Method of Compilation

The methods used in the compilation of the Population Density maps are illustrated by the following notes from a manuscript paper on "The Preparation of the 1/1,000,000 Population Map of Scotland" by Mr. A. C. O'Dell.

"One-inch Ordnance Survey maps of approximate survey date 1925-30 were used, and on account of the scale of the finished map, were taken as a correct picture of the distribution of buildings. Quarter-inch parish index maps were used with manuscript additions by the Ordnance Survey of Burgh and Ward boundaries.

"The density per 100 acres was marked for each of the administrative units on a set of quarter-inch index maps, and the whole parish or ward shaded according to the grades of population density adopted for the final map. On an overlay the areas of virtually uninhabited land were then delineated by reduction from the one-inch maps. These areas were taken as large areas of bog, forest and the hill-land outside the hill-dyke. (In England and Wales, they were taken as appreciable

areas without settlement.) The acreage of uninhabited land was deducted from the total parish acreage and the reduced acreage of the parish was then used to compute corrected density figures.

"The country was then studied systematically to see where the inhabited areas could be split up into areas of varying population density. In order to get a measuring scale individual parishes of relatively even building pattern were selected and this pattern was used for judgment in other areas. Recourse was also had to the Census Report, Table 7, "Population of Special Islands" to break up the parish totals. Periodically

building counts were made in non-village settlements and multiplied by the average number of persons per house in the landward area (Census Report, Table 27, 'Houses, Number of Rooms and of Persons') to prevent appreciable change of judgment in the distribution of houses.

"Zones of population density having been drawn, these were checked by measuring the area of each grade, multiplying by the density decided upon as appropriate and seeing whether the more congested areas were in a sufficiently high density grade to account for all the persons entered at the Census."

Population of Urban Areas 1938

The urban areas map is designed to give a clear picture of the urbanisation of Great Britain, and to show at a glance the relative sizes of the populations of all towns and their spatial relationship one to another. Not only are such features as the arc of towns reaching from Leeds and Bradford to the Birmingham-Coventry area, the group of towns in the Clyde valley and the urban fringe along the south coast of England at once apparent, but also the differences in distribution and size of rural towns from one region to another are clearly shown. As an example of the latter, the pattern of fair sized market towns in the Fenlands evenly spaced ten to fifteen miles apart may be contrasted with the scattering of very small towns in the Welsh borderland, where Shrewsbury and Hereford are the only sizeable centres, and with the almost complete absence of towns in the West Highlands.

Source and Style of the Map

This map is drawn from the mid-1938 estimates of Resident Population prepared by the Registrars General,

as set out in column 6, Table 1, of the National Register 1939 and related to areas as constituted in 1939. The year 1938 was chosen because it was the last year before the commencement of war-time population movements and the rearmament programme.

A red circle, the area of which is proportional to the population, is centred on each town. The name of the town is shown in a different style of type according to its status as a County Borough, Municipal or Metropolitan Borough, or Urban District in England and Wales, and a County of a City, Large Burgh or Small Burgh in Scotland.

The populations of Rural Districts in England and Wales are not represented, although in a few rural areas adjacent to large towns there has been a considerable spread of urbanisation. In Scotland, only the populations of Burghs are represented. There are, however, some settlements of considerable size which are not Burghs—for example, Cambuslang, Alexandria and Larbert.

Population Changes

Total Changes	1921-1931, 1931-1938/39 and 1938/39-1947	the combined effects on the population of births, deaths and migration, and one showing the effects of migration only.
Changes by Migration ...	1921-1931, 1931-1938/39 and 1938/39-1947	

The population changes which have occurred since the first World War have effected considerable changes in the social pattern and the face of the countryside. The maps show to what extent population growth has been concentrated in some former rural areas adjacent to the older towns, often at the expense of somewhat more distant rural areas and small towns; and in the case of many of the larger urban concentrations, at the expense of their central areas, where houses have given place to offices and shops. London is the outstanding example of this latter movement. The decrease of population in the remoter rural areas is particularly marked in Scotland and Wales.

In many districts there is a close connection between population increase and new industrial development. Prominent examples are the Bristol-Gloucester area with its recent expansion of factories and the Nottingham and Derby coalfield where the population has shifted from the exposed coalfield in the west to the more recently developed concealed field in the east. In contrast, certain older established regions, associated with mining and other industries suffering depression in pre-war years, have, in spite of experiencing considerable population growth from 1911-21, suffered a heavy loss of population by migration and a total decrease, notwithstanding their relatively high birth rates.

The maps of population changes cover three periods, first the intercensal period 1921 to 1931, second the period immediately before the war, 1931-1939 (1938 for Scotland) and third the war period from 1938/39 to 1947. For each of the periods there is one map showing

Sources of Statistics

The figures of total population have been taken for the years 1921 and 1931 from the Census Reports, and for the other years from published and unpublished mid-year estimates made by the Registrars General. For each area they have been corrected to refer to resident population and adjustments have been made to take account of boundary changes. The areas to which the statistics refer are those of the terminal date of the period concerned, except in the case of Scotland 1921-31, as explained below.

A number of minor anomalies remain, the chief of these being due to the fact that, since the 1947 figures for England and Wales do not include members of the Armed Forces, the population change maps for 1939-47 were, in respect of England and Wales, constructed on a basis of "civilians only".

For the maps showing total change, the change for each locality has been calculated as the difference between the populations of the first and last year of the period and has been expressed as a percentage of the first year's population.

For the maps of migration, calculations were first made of the natural change in each area, i.e. the difference between the total numbers of births and deaths during the period. The migration was then calculated as the difference between total change and natural change. This has also been expressed as a percentage of the first year's population. The figures for births and deaths were taken from the Annual Statistical Reviews of the Registrar General for England and Wales and from the

Annual Reports of the Registrar General for Scotland.

On all the maps the changes are shown for each administrative area; that is for all County, Municipal and Metropolitan Boroughs, Urban and Rural Districts in England and Wales and in Scotland for all Counties of Cities, Large and Small Burghs and Landward Areas. On the maps of migration for 1931-1938 and 1938-1947 it has not been possible to sub-divide the Landward Areas in Scotland, as vital statistics are not now available for smaller areas. On the maps for the period 1921-1931, the Landward Areas are divided into Public Health Districts. These districts were superseded in 1929 and the 1931 statistics were therefore adapted from those for the new District Council Areas. On the maps of total changes for 1931-1938 and 1938-1947 the Landward Areas are divided into District Council Areas.

Style of the Maps

Colour tints are used to show the percentage population changes, reds indicating increases and greens decreases. It would be misleading to show percentage changes without giving some indication of the size of the absolute changes, because, for example, a 3 per cent decrease between 1931 and 1939 meant the loss of 1,817 people to Wood Green M.B., Middlesex, but of only 70 people to Wivenhoe U.D., Essex, and only 17 to Inveraray Burgh in Argyllshire. Symbols are therefore used to show absolute changes for each Administrative Area, a circle or a square being drawn proportional in area to the actual number of persons by which the population has increased or decreased. In urban areas where the population is concentrated, the symbols are circles centred on the towns, but in rural areas where the population is scattered and the symbols must be arbitrarily placed, squares have been used. Changes of less than 500 persons have not been shown and those of between 500 and 1,000 are all shown by a symbol representing 750 persons.

Unpopulated Areas

It seemed desirable not to carry the colours representing percentage changes in population over areas of mountain and moorland which have almost no population, especially in Scotland where there are large virtually uninhabited areas. The principal virtually unpopulated areas have, therefore, been left uncoloured. The areas so delimited are a generalised version of the white area (virtually uninhabited, 0.1 persons per square mile) on the 1/625,000 Population Density 1931 map, redrawn with the help of Land Utilisation 1 inch and 1/4 inch maps showing areas of "Moorland, Heathland and Rough Pasture" and 1 inch Ordnance Survey maps of the Popular Edition, which gave the distribution of houses and settlements. In general, areas of lowland forest, such as the New Forest or Darnaway Forest, such sand-dune areas as those along the Morayshire coast, marshland or peat bog like Mall-draeth Marsh and Lochar Moss or hills in rural areas such as the South Downs or Cotswold Hills have not been included as unpopulated areas, because of their relatively small extent.

In the Highlands this method results in a large number of small isolated patches of colour corresponding to the isolated settlements. It should be pointed out that within each district these patches are all coloured in the same tint. For example, on the 1921-31 total changes map all the patches in the Lochaber district of Inverness are coloured to show an increase, whereas in actual fact probably all the increase occurred near Fort William, but the statistics do not allow the other parts of the area, which probably showed a decrease comparable with those areas to the north and south, to be distinguished.

Comparison between the Maps for the Three Periods

On the reference panels of the different maps the various shades of colours used for the groups of percentage changes are so arranged that the same colour represents the same annual average percentage change.

It is easy, therefore, to compare the rates of change which took place in the different periods.

The following standard groupings of average annual percentage changes have been used throughout the series:—0-1, 1-2, 2-4, 4-6, 6 and over. On the 1921-31 maps, however, where the statistics are considerably more reliable, it has been possible to sub-divide the first group (0-1 percentage change), into two classes 0-0.5 and 0.5-1. Since for Scotland the 1921-31 and 1931-38 periods cover $9\frac{3}{4}$ years and $7\frac{1}{4}$ years respectively, when the average annual percentage change groups are expressed as total changes over the periods, the groupings do not progress by a series of whole numbers.

Reliability of the Maps

Since the basic data do not in all cases represent exact knowledge, and since adjustments for boundary changes are only approximate, the estimates of population changes used in constructing the maps are accurate only within certain limits. The method used by the Registrar General for England and Wales in preparing the annual estimates is fully described in the Text portion of the Statistical Review for 1936.

The Registrar General states that his mid-year estimates are constructed by adjustment of the enume-

rated 1931 census populations, first for residence and second in accordance with available evidence of changes in population which occurred between the date of the census and the middle of the year in question. The second adjustment includes an allowance for migration in respect of which no specific records exist, and indirect sources of information such as registers of electors and housing statistics, neither of which are satisfactory indicators of population movement, have to be used. It is clear, therefore, that the pre-war mid-year estimates are subject to errors which may be expected to grow in degree as the preceding census becomes more remote. Since 1939 the data available from the National Register and Ration Book issues should have increased the accuracy of the mid-year estimates.

In view of these facts the grouping of percentage changes represented by different tints on the maps have been made as broad as possible and the classes of average annual percentage change of 0-0.5 and 0.5-1.0 used on the 1921-31 maps have been combined on the maps of the other periods. It is possible that some areas may be shown in the percentage group immediately above or below the one representing the true change, but there is only a remote possibility of misplacement greater than this.