

Clark University

Clark Digital Commons

Historical Dissertations & Theses

Archives & Special Collections

5-1928

Geographic studies of population and settlements in Worcester County, Massachusetts

Willem Van Royen

Follow this and additional works at: https://commons.clarku.edu/hist_disstheses



Part of the [Geography Commons](#)

Recommended Citation

Royen, Willem Van, "Geographic studies of population and settlements in Worcester County, Massachusetts" (1928). *Historical Dissertations & Theses*. 35.
https://commons.clarku.edu/hist_disstheses/35

This Dissertation is brought to you for free and open access by the Archives & Special Collections at Clark Digital Commons. It has been accepted for inclusion in Historical Dissertations & Theses by an authorized administrator of Clark Digital Commons. For more information, please contact larobinson@clarku.edu, cstebbins@clarku.edu.

GEOGRAPHIC STUDIES OF POPULATION AND
SETTLEMENTS IN WORCESTER COUNTY, MASSACHUSETTS.

BY

WILLEM VAN ROYEN.

One volume and folio.

A dissertation submitted to the
Faculty of Clark University, Worcester,
Massachusetts, in partial fulfillment
of the requirements for the degree of
DOCTOR OF PHILOSOPHY in the Department
of GEOGRAPHY and accepted on the
recommendation of

Ballard W. Wood
Elmer Churchill South

JUNE 1928.

TABLE OF CONTENTS

- Chapter I Introduction
- Chapter II The physical environment.
- Location
 - Physical features
 - Soils
 - Climate
- Chapter III Early population of Worcester County
- Sequence of settlement
 - Economic basis of life
 - Occupation of the population
 - Composition of the population
 - Trend and movement of the population
- Chapter IV Population of Worcester County after 1830
- General factors affecting the population of Worcester County
 - Increase and decrease of agricultural area
 - Changes in the distribution of industries
 - General trend of population in the towns of Worcester County
 - Cartograms and maps of density of population
 - Immigration and changes in composition of the population
- Chapter V Types of development
- A town that has gone down-hill
 - A town where agriculture has been started on a new basis
 - A rural community influenced by a developing urban community
 - Urban-industrial communities
- Chapter VI The settlements in Worcester County
- Kinds of settlements
 - Location and types of settlements
 - Typical development of some settlements
- Chapter VII Conclusion

Bibliography

Maps figures 24 to 46. Maps figures 1 to 23 and 40 to 50
in folio.

Appendix. Tables

LIST OF FIGURES

- Fig. 1 Physical map of Worcester County.
- Fig. 2 Lakes and ponds in Worcester County in about 1790.
- Fig. 2a Lakes and ponds in Worcester County in 1928.
- Fig. 3 County roads in Worcester County in 1794.
- Fig. 4 Old town boundaries about 1765.
- Fig. 5 Trend of population of Worcester County.
- Fig. 6 Trend of population of towns of Worcester County.
- Fig. 7 Trend of population of towns of Worcester County.
- Fig. 8 Mills in Worcester County in about 1790.
- Fig. 9 Mills and factories in Worcester County about 1830.
- Fig. 9a Cotton and Woolen factories in Worcester County, 1900.
- Fig. 10 Distribution of forest in Worcester County in 1830.
- Fig. 11 Distribution of population in 1855.
- Fig. 12 Density of population in northeastern part of Worcester County, 1830.
- Fig. 13 Density of population in northeastern part of Worcester County, 1855.
- Fig. 14 Land utilization in Dana, 1927.
- Fig. 15 Abandoned farms in Dana.
- Fig. 16 Land utilization in Harvard, 1927.
- Fig. 17 Abandoned farms in Harvard.
- Fig. 18 Auburn in 1860.
- Fig. 19 Auburn in 1927.

- Fig. 20 Worcester in 1830.
- Fig. 21 Worcester in 1851.
- Fig. 22 Worcester in 1870.
- Fig. 23 Worcester in 1922.
- Fig. 24 Key to the cartograms of Worcester County.
- Fig. 25 Sequence of settlement in Worcester County.
- Fig. 26 Cartogram of the density of population, 1790.
- Fig. 27 Cartogram of the density of population, 1830.
- Fig. 28 Cartogram of the density of population, 1860.
- Fig. 29 Cartogram of the density of population, 1895.
- Fig. 30 Cartogram of the density of population, 1925.
- Fig. 31 Cartogram of occupation of population, 1820.
- Fig. 32 Cartogram of occupation of population, 1840.
- Fig. 33 Cartogram of occupation of population, 1865.
- Fig. 34 Cartogram of occupation of population, 1885.
- Fig. 35 Cartogram of occupation of population, 1915.
- Fig. 36 Cartogram of composition of population, 1830.
- Fig. 37 Cartogram of composition of population, 1855.
- Fig. 38 Cartogram of composition of population, 1885.
- Fig. 39 Cartogram of composition of population, 1885.
- Fig. 40 Cartogram of composition of population, 1915.
- Fig. 41 Cartogram of composition of population, 1915.
- Fig. 42 Cartogram of agricultural area, 1791.
- Fig. 43 Cartogram of agricultural area, 1831.
- Fig. 44 Cartogram of agricultural area, 1851.

Fig. 45 Cartogram of agricultural area, 1885.

Fig. 46 Cartogram of agricultural area, 1916.

Fig. 47 Composition of population of Clinton.

Fig. 48 Composition of population of Webster.

Fig. 49 Composition of population of Blackstone.

Fig. 50 Composition of population of Barre.

Chapter I.

INTRODUCTION

The purely human element, and the study of its development and distribution, has always been more or less neglected in geography. The surface features of the earth and their genesis are analyzed or the distribution of the fruits of human toil on the land and of man's humble servants are pictured and studied, but the study of the factors influencing the distribution of man, the active and directive agent in the utilization of the earth's resources, has not received much attention from geographers.

Mountains and valleys, although subjected just as living forms to Nature's laws of birth and decay, always leave some traces of their former existence. Man hardly leaves any traces. His works are fragile, and their remains offer an only very insecure basis for estimates of numbers and distribution of population in earlier times.

Exact figures, based on real enumerations of the population are a product of modern science. Only in a few cases they reach back into the 18th century. Although census figures become ever more reliable and ever more detailed, it is at present still harder to

obtain the facts as to man's numbers and as to his extremely uneven distribution, than it is to obtain the same for his domestic animals.

The study of the human element has always been considered as one of the important parts of geography. Ratzel calls the second volume of his *Anthropogeographie* "The geographical distribution of mankind." Vidal de la Blache considers the map, that shows the distribution of population, as most essential, and the first part of his "*Principes de Géographie Humaine*"¹ is devoted entirely to the study of this aspect of population. A. R. Toniolo² gives the study of the distribution of mankind the first place in his definition of geography.

The population question as a whole has become more and more the subject of discussion during recent years. There are many signs of a growing uneasiness about the rapid increase of mankind. Slowly it seems to dawn upon man that there is a limit to man's multiplication, above which he cannot go without adverse results, and that the underlying principles of the laws

1. Vidal de la Blache, *Principes de Géographie Humaine*, Paris 1921.

2. Toniolo A. R., *L'antropogeografia negli odierni suoi problemi etc.* Pisa 1914.

of Malthus, although suspended temporarily by the industrial revolution, still hold true.

Year by year we obtain better information on the total number of people in the different regions of the earth; year by year we get a clearer idea of the present and future natural resources. Maps, showing the distribution of the population over the earth, have been made by geographer and statistician since the middle of the last century; by Petermann³ and Wagner⁴, Böhm⁵, Supan⁶, Levasseur⁷, and Weise⁸. Maps of smaller regions can be found for example in the publications of the United States Census and have been made by Ravn⁹ for Denmark, by Sten de Geer for Sweden¹⁰, by Semenov Tian Schanskij¹¹ for Russia and by Lefèvre¹² for Belgium. The better and more complete

-
3. Population Maps of the Iberian Peninsula, of Siebenburgen, and of Oesterreich-Ungarn by A. Petermann in Petermanns Mitteilungen 1856, 1857 and 1860.
 - 4-6 Behm, H. Wagner and A. Supan
Die Bevölkerung der Erde, in : Petermanns Mitteilungen, Ergänzunghefte
 7. Levasseur, E. Densité de la population dans les cinq parties du monde, 1885. Bulletin de l'Institut intern. de Statistique, II. Rome, 1887.
 8. Weise, L. Darstellung der Bevölkerungsverteilung in Europa. Petermanns Mitteilungen, 1913.
 9. Ravn, Statistik Tabelvaerk-Kjöbenhavn, 1887.
 10. Sten de Geer
Befölkeringens fördening i Sverige. Beskriföring till karta i skalan 1: 500 000.
 11. Semenov Tian Schanskij, V.P.
Dasymetritscheskaja Karte Europeiskoi Rossii. Inst. Powerchnostj i Nedra. Leningrad. 127 sheets.
 12. Lefèvre, M.A.
La densite des maisons rurales en Belgique. Annales de Géographie, 1923.

the statistics became, the better became the maps. All of those publications, however, are very general, and some are more statistical than geographical.

Regional treatises on population are needed: studies either of the development or of the actual distribution of the population in certain areas. Much work in this field is still to be done. It is natural that the best regional studies of population have been made in countries where the pressure of population is felt quite strongly, - in Germany and Italy. Excellent work has been done in Germany by Hettner¹³, Neukirch¹⁴, Fickert¹⁵,

-
13. Hettner, H.
Ueber bevölkerungsstatistische Grundkarten.
Geographische Zeitschrift 1900.
 13. Hettner, H.
Ueber die Untersuchung und Darstellung der
Bevölkerungsdichte.
Geographische Zeitschrift 1900.
 14. Neukirch, N.
Studien über die Darstellbarkeit der Volksdichte,
etc. Diss. Freiburg, 1897.
Vide : Geographische Zeitschrift 1897,
Petermanns Mitteilungen 1897,
and Petermanns Mitteilungen 1899, Literaturbericht
565.
 15. Fickert, H.
Die Bevölkerungsdichtigkeit der Rheinprovinz
Inaug. Diss. Halle, and Petermanns Mitteilungen
1920

Closterhalfen¹⁶ and Kaesmacher¹⁷, Neumann¹⁸, Ambrosius¹⁹,
E. Wagner²⁰, Reihard²¹ and others. For Italy we have

16. Closterhalfen, K.
Die kartografische Darstellung der Bevölkerungsdichte.
Petermanns Mitteilungen 1912, II.
17. Kaesemacher, C.
Die Volksdichte der thüringische Triasmulde.
Forschungen zur deutschen Landes - und Volkskunde.
VI, 1892.
18. Neumann, L.
Die Volksdichte in Eaden.
Forschungen zur deutschen Landes - und Volkskunde,
VII, 1893.
19. Ambrosius, E.
Die Volksdichte am deutschen Niederrhein.
Forschungen zur deutschen Landes - und Volkskunde,
XIII.
20. Wagner, E.
Die Bevölkerungsdichte in Sühhannover und deren
Ursachen.
Forschungen zur deutschen Landes - und Volkskunde,
XIV.
21. Reihard, W.
Volksdichte und Siedelungsverhältnisse des
württembergischen Oberschwabens.
Forschungen zur deutschen Landes - und Volkskunde,
XVII.

the publications of Anfossi²², Dainelli²³, Mori²⁴, Riccardi²⁵, Calamonic²⁶, and others. Very important also is the study of de Martonne²⁷ of the density of population of Walachia.

It is to be regretted that the students of the problem become engaged too often in endless and unfruitful methodical discussions, of how the density or dis-

-
22. Anfossi, G.
Ricerche sulla distribuzione della popolazione in Sardegna.
Bollettino della Reale Società Geografica, Serie V, Vol. IV, 1915.
22. Anfossi, G.
Recherches sur la distribution de la population en Corse.
Recueil des Travaux de l'Institut de Géographie Alpine, Université de Grenoble, Tome VI, 1918.
23. Dainelli, G.
La distribuzione della popolazione in Toscana.
Memorie Geografiche di G. Dainelli, pubbl. come suppl. alle Revista Geogr. It. 1917.
24. Mori
Distribuzione della popolazione in Sicilia.
Memorie Geografiche, etc. 1920.
25. Riccardi, R.
Distribuzione della popolazione in Sabina dal 1656 al 1911.
La Geografia IX, Novara.
25. Riccardi, R.
Distribuzione della popolazione in Sabina.
Bollettino della Reale Società Geografica, Serie V, Vol. XI, 1922.
26. Calamonic,
Distribuzione della popolazione nella Puglia.
Bollettino della Reale Società Geografica, Serie V, Vol. V, 1916.
27. de Martonne, E.
Recherches sur la distribution de la population en Walachie avec étude critique sur les procédés de représentation de la répartition de la population.
Bulletin Societatea Geografica Romina, XXIII, Semestrul II, 1902.

tribution of people should be represented cartographically. Of course in the geographical treatment of a problem of this kind, cartographic representation of the phenomena is essential. For this, however, no infallible method exists. Different conditions will require different methods. In the case that one kind of map is not fit to elucidate all the angles of the problem, maps made according to other methods should be inserted if possible. The main point is that the method best adapted to the data in hand should be used regardless of methodical objections, which can be raised against any method whatsoever.

Massachusetts is a tempting field for regional studies of this kind. Very divergent conditions occur in its different parts, and contrasts are strong and close together. From the point of view of the development of the population the problems are even more interested, as the largest part of the state has been affected during the last century by various complexes of economic and social factors in rapid succession. Everything in the population has been influenced, everything has changed,- the number, the location, the occupation, the composition. For a young country, like the United States, where the population is much less stable than in most of the old world countries the dynamic aspect of the population problem is always more pronounced. In a region with the development of Massachusetts the dynamic side becomes all important.

The data about the population of Massachusetts are partly good, and for the larger part excellent. The data in the Census reports of the United States go back to 1790, and some older data are preserved. The reports of the State Census are exemplary. The men in charge of these monumental publications have had for a long time a strong and beneficial influence upon the methods of the Federal Census. The only thing to be regretted is, that for the year 1925 all detail work was omitted. This has left a gap in the series of data that the Federal Census will not be able to fill in, for the Federal Census does not publish data in equal detail.

There are however a large number of difficulties in studying some of the aspects of the population problem in Massachusetts. In the first place the difficulty of the adjustment of data obtained from different sources is a serious handicap, and makes all accurate representation of the facts impossible. On the other hand, the margin of error inherent to statistical data, especially to older ones, is such that it offsets those disadvantages more or less. The units for which the population data come, (townships) are sufficiently small for a study of a large area and for a representation on a small scale map. For a study of a smaller area the New England town system has serious disadvantages. Within the average 6 square miles of the town the population can be distributed in

many different ways. In case that one or two important centers of population occur within its limits, the Census Reports do not give any numerical information at all about the size of those nuclei. Rather complete atlases exist for some periods, but their dates do not correspond with the dates of the census. For the present conditions the records are the scantiest of all. No official town maps exist, no cadastral records, and no records of the movements of the population are available. The only official map existing, the sheets of the U. S. Topographic Survey carry few up-to-date facts of human geography. The representation of the facts of population has been, therefore, very difficult.

The choice of an administrative division, such as Worcester County, for unit of study was largely determined by practical considerations.

From the purely geographic point of view the natural region is the most commendable unit and should be used, wherever possible. But the statistics by administrative units would make the work, based on natural limits, many times as difficult. The size of the town, relative to that of the whole country, excludes any approximate method of taking as limits for the natural regions those town boundaries that come nearest to the natural boundaries. It is intended as a preliminary treatment of a regional population problem with the hope that it will be a stimulus

for further research in this line, and for similar studies in other parts of the United States.

CHAPTER II

THE PHYSICAL ENVIRONMENT

LOCATION

Worcester County is located in the geographical center of the State of Massachusetts. At the same time it lies in the midst of the region between the Connecticut valley and Boston Bay, with its eastern boundary nearly as far from the latter, as the western boundary from the former. The County of Worcester is a true inland county. In meridional direction it extends entirely across the state, and is bounded on the north by the state of New Hampshire and on the south by the states of Rhode Island and Connecticut. It has an area of 1522 square miles (3800 square Kilometers) and is the largest county in the state of Massachusetts.

PHYSICAL FEATURES

Worcester County belongs to two different natural regions. The larger and western part of the county is a portion of the upland, that stretches from Connecticut northward across Massachusetts into New Hampshire. The part of this highland belt within Massachusetts is usually called the Central or Massachusetts Upland. No natural

boundaries of the county exist at the north or south. The western boundary corresponds more or less closely with the eastern slope of the Swift River depression, while the eastern boundary coincides for a large part with the general course of the 300-foot contour. (See figure 1.)

The western part is an uplifted peneplain that seems to have been exposed for a relatively long time to the action of rivers and of inland ice. Although most of this surface is covered by a mantle of glacial debris, which varies somewhat in thickness, the view from a high point brings out the concordance of the summit levels. Such a view gives to the landscape a much greater simplicity than it seems to possess, when looked at from the bottom of the daedalus of eroded and partially filled pre-glacial, glacial and post-glacial valleys.

The elevation of the upland varies from 600 to 1200 feet. It is highest in the north and reaches here in places to over 1200 feet above sea level. The transition eastward to the low plains of the Nashua River basin is rather rapid, but the slope is not steep enough to be called an escarpment. Southward, the upland slopes down gently to elevations of between 700 and 800 feet. The transition of the upland to the hilly lowland around the Boston Basin becomes much less marked, as a result of this lower summit level of the upland toward the south and the greater elevation of the hilly

lowlands in the southeastern part of Worcester County. Toward the west we find a rather rapid transition to the north-south trending depression of the Swift River.

Several basin like depressions penetrate into the eastern margin of the upland, of which those of Fitchburg and Worcester are the most pronounced. In the interior we find the basins of Brookfield and of Winchendon-Templeton. Considerably above the general level stand the monadnocks Mount Wachusett and Mount Watatick, on the old peneplain. Asnebumskit Hill is but 200 feet above the surrounding plateau and although usually quoted as such, it can hardly be considered a monadnock.

The general summit elevation of the eastern transitional belt varies from 300 to 400 feet. It is lowest in its southeastern and northeastern parts. In the central section there are several outposts of the eastern margin of the upland which reach elevations of 600 and 700 feet.

The influence of the geologic structure on the relief is relatively slight. The Cretaceous or Post-Cretaceous peneplains truncate the different strata regardless of structure. It seems that in places either pre-glacial or glacial erosion, or both, have emphasized some differences due to differences in geological composition. Thus the

Swift River basin is restricted to the softer Monson Granodiorite, and the Nashua valley is largely within the less resistant Worcester phyllite, which occurs also in the Worcester Basin. The higher ridge trending north-northeast from Lake Quinsigamond to Harvard it made up largely of schists and gneisses of undetermined age, and the highest part of the ridge coincides with a long and narrow ribbon of Brimfield schist. Generally speaking, however, the influence of the action of water and ice is predominant. The whole area is one of subdued, rolling relief. The pre-glacial summit topography was probably rather smooth and has been still more smoothed and rounded by the continental glaciation. Whatever the original shape of the valleys may have been, the ice rounded their contours and filled them partially.

No sharp surface features occur, except at the western edge of the upland toward the Swift River depression, where the valleys have started to cut back into the upland in young, narrow valleys. Although on one hand the ice has worked simplifying by blotting out greater differences in elevation, on the other hand it has created an astonishingly irregular detail-relief. The different kinds of accumulation of glacial material on the irregular cover of boulder clay, the drumlins, the kames and kame terraces, the eskers, they

all add to the extraordinary complexity of the appearance of the region.

This complexity is emphasized by the drainage system. The principal rivers are the Nashua, Blackstone, Quinebaug, Quabaug, Ware River and Millers River. Their systems bear the marks of frequent changes in drainage, pre-glacial changes, as well as changes, caused by the inland ice. Their courses are full of unexpected bends and their profiles are irregular to a high degree. Large and small basins occur everywhere along the courses of the rivers. Sometimes they are successions of hollows gauged out by the glacier, sometimes irregularities in the mantle of glacial debris. When white man entered this region, only a few of these depressions were still filled with water. (See figure 2 and 2a) Between these basins and especially in places where the rivers have cut down into the underlying rock, instead of into the soft glacial deposits over their former courses, we find the numerous low falls and rapids that have proven to be of such enormous importance in the economic development of the region.

SOILS

The soils of Worcester County betray clearly their recent glacial origin. They are extremely varied in composition, and still more varied as to location. They occur locally in relatively large, more continuous areas,

but more generally in isolated areas of different sizes, scattered over different parts of the country in great variety. They belong to the large group of the brown soils. They are young, for the time that has elapsed since the retreat of the glaciers has been too brief for the processes of soil formation to proceed far toward maturity. The profile is accordingly poorly developed. Not only has the time been too brief, but the climate has retarded the process in addition. The parent material, derived largely from underlying or neighboring rock material is little decomposed. As a result a close relationship exists between the groups of soils and the different geologic formations. The soil groups show the same belt-like distribution.

The Gloucester soils occur east of a line through Ashburnham, Westminster, Princeton, Holden, Oakdale, Shrewsbury, Millbury, Sutton, South Charlton and Dudley.

The Charlton and Paxton groups occupy an area between this line and another line through Harrisville, Baldwinville, Templeton, Hubbardston, North Rutland, West Rutland, West Rutland, Spencer, Charlton City and Southbridge.

The Brookfield soils occur westward of this line to a line from Templeton via Barre to Warren.

The remainder of Worcester County is occupied again by the soils of the Gloucester series.

The glacial soils are on the whole of rather good quality, although the current opinion about them is unfavorable. They may be inferior in comparison with the soils of Indiana and Illinois, but they are certainly far better than many of the glacial soils of Europe that have been tilled with much success. Because of the youthfulness of the soils they retain considerable mineral reserve in the form of unweathered material, but since they give this reserve up only very slowly, as slowly as the processes of weathering advance, the restoration of the fertility in soils worn out by unscientific cropping, though slow, is certain.

The greatest handicap are the rough uneven surface and the abundance of glacial boulders of all conceivable sizes; most towns enjoy the rather doubtful advantage cited favorably in old books, of having plenty of stones to fence with. Very often they make tillage, or the use of machinery for cutting and gathering the hay crop impossible.

More significant than the distribution of the soil groups, is that of groups of the different soil types, classified according to their importance for agricultural purposes.

The best and most important soils are the loams that do not contain too many boulders, including the Paxton loam, the Gloucester loam, the Brookfield loam and some types of minor extension as Merrimac sandy loam, Merrimac fine sandy loam, Sutton loam, Charlton fine sandy loam, Charlton loam, and Bernardston silt loam. These soils comprise about 30 percent of the whole area of the county. The best soils, as a rule, occur on the rather level tops of the ridges. Many of the loams also lap over the sides of the hills; but here on the steeper slopes, where the finer material can be washed away more easily, and in the hollows and pockets where the glaciers seem to have preferred to drop the largest part of their burden of rock, boulders and ledges abound. Most of these types of loams are unfavorable for agricultural use.

Very marked in this respect is the Brookfield loam that occurs in long narrow patches on the tops of the ridges in the southwestern part of the county. The Gloucester loam occurs in the same general position in the eastern half of the region. Paxton loam on drumlins and drumloid hills has the same character of distribution in the central part of the County. The fine sandy loams that are well adapted to agriculture form only a small percentage of the better soils.

They occur in lower spots and most of them have developed on terrace deposits along the Ware and Blackstone rivers and on the old lake basins in the eastern part.

The loams seem to be of slightly different value according to the material from which they are derived. The parent material of the Paxton loam consists of a mixture of detritus from schists, slates and granites. Eighty-five to ninety percent of it is cultivated. The Gloucester loam and Brookfield loam are derived respectively from granites, gneisses and schists. About 70 percent of these soils is cleared.

Charlton loam and Sutton loam are derived from light-colored, acidic granite, quartz schists, and quartzites, and contain as a result much more silicate material. A much lower percentage of these loams is cleared and half of the area in agricultural use on the Sutton loam is in bush pasture.

The sandy loams in the valleys are very well cultivated. Of the Merrimac fine sandy loam 90 percent is cleared. Of the Merrimac gravelly sandy loam 75 to 80 percent and of the Merrimac sandy loam 60 to 65 percent.

The rest of the county is occupied by soils that are not so well suited to agricultural purposes. Some of them are too sandy and many of them are too stony. Under

the latter category comes the Merrimac loamy coarse sand, under the former the Brookfield stony loam, Charlton stony loam and others. Some of them are still in use, and on many extensive tracts have been allowed quite recently to grow up into woods. This is even true for the better loamy soils of the county.

CLIMATE

As a part of New England Worcester County shares all the climatic characteristics of this larger region. The winters are long and rather cold. The summers are short and warm. The average July temperature is about 70 degrees F., while the average temperature for January and February is about 25 degrees F. However, the mean conditions vary greatly from year to year. The last killing frost occurs around the end of April and the spring is short and arrives suddenly. The fall is the most pleasant time of the year. The temperature is not too high and rather stable. The first killing frosts occur around the middle of October, and in the northwestern, higher part still earlier. The changes in the weather are manifold and sudden, as the area is in the path of numerous storms due to the convergence of cyclonic tracks. In winter and spring periods of intense cold alternate at times in rapid succession with

periods of thaw or spring weather.

In the summer passing lows brings winds from the sea with cool or more often, warm muggy days. Late summer and fall are occasionally punctuated by tropical cyclones. The fall has the most stable types of weather. Nocturnal lowland fogs are frequent in September and early October. Towards the end of this season the lows become more numerous until the rough conditions of winter have been established. The winds change with the continual succession of lows and highs, but come predominantly from the southwest in the summer and from the northwest in winter.

The precipitation is usually sufficient for vegetation and crops, and is distributed rather evenly over the year. The annual mean precipitation varies between 40 and 45 inches. Part of it falls as snow. The average annual amount of snow is 50 inches. The duration of the period with a snow cover is about 100 days. The frequent periods of thaw weather that interrupt the continuity of the snow cover, have a very bad effect on the passability of the country roads.

In its local characteristics the climate of Worcester County is that of a true inland region. The direct influence of the sea on temperatures, not important on the whole in New England, is but slight, and the most pronounced during the afore mentioned periods of muggy summer weather.

The higher part of the upland, west and north of the lines Fitchburg-Worcester and Worcester-Ware, is, the year through, cooler than the rest of the County. It is to be regretted that no records of temperature exist for any place on the upland; therefore no accurate figures can be given. The neighborhood of the sea does not make itself felt far enough inland to ameliorate the winter minima. Only the Blackstone valley and the region from Boston inland as far as Southboro seem to be areas where the sea has any marked influence in this respect. In the late spring the valleys of the Ware, Nashua and Blackstone rivers form areas of slightly higher temperature, penetrating into the colder upland. The latter remains cooler the whole summer through, although the difference does not seem to be very marked in July and in August. The southern and eastern part of the County is, during this time, a region of higher temperatures, without the ameliorating influence of either altitude or sea. The influence of the latter does not seem to extend farther than the lower Blackstone valley. By December the winter conditions become predominant. The temperatures decrease then rather markedly toward the high interior of the County.

On the whole the climate is favorable for settlement. Although the growing season does not exceed on the average

170 days and is very probably considerably shorter on the upland, the most important crops can all be grown. Although the winters are long and cold, the cold is drier here than in many other regions at the same distance from the sea, and it makes the climate healthy and invigorating.

The date of the first settlement in this county, early in the history of the New England colonies, has been a subject of much inquiry. It is probable that these settlements were restricted to the strip of lower hilly land that occupied the eastern part of the county (Figure 1). The higher areas, especially the Upper Nashua-lake and the Blackstone River depression, were not very attractive to the early settlers. The topography was rough and the land was rich in woodlands, swamps and Indians. Communication was difficult in the westerly direction, because of the north-south orientation of the hills and valleys. Although the road was regarded along the road through the wilderness, it was not a route for parties of settlers destined for the Connecticut valley, for a long time these hills continued to be a serious natural barrier to further expansion of the pioneers.

The lower northeastern part, including the lands at both sides of the Upper Nashua, was settled and improved at an early date as a result of the fact that the road was not a serious barrier to further expansion of the pioneers.

CHAPTER III

EARLY POPULATION OF WORCESTER COUNTY

SEQUENCE OF SETTLEMENT

Although the political history of Worcester County does not start until the fifth of April 1731, the date of its incorporation as a county, early in the history of the New England Colonies settlers had taken up lands in parts of its present area. For a considerable time those settlements were restricted to the strip of lower hilly land that occupies the eastern part of the country. (Figure 1). The higher areas westward of the Upper Nashua-Lake Quinsigamond-Blackstone River depression were not very attractive to the early settlers. The topography was rough and the land was rich in boulders, swamps and Indians. Communication was difficult in an east-west direction, because of the north-south extent of the hills and valleys. Although the upland was traversed along the "road through the wilderness" several times by parties of settlers destined for the Connecticut valley, for a long time these hills continued to be a serious natural barrier to further expansion of the pioneers.

The lower northeastern part, including the lands at both sides of the Upper Nashua, was settled and incorporated as a town as far back as 1654. It contained most

of the area that is now occupied by the towns of Harvard, Bolton, Berlin, Lancaster, Clinton, Sterling and Leominster. Most of the town consisted of relatively low land, although a spur of upland was cut off and included, south of what is now Leominster. For site of the village an eminence was chosen near to the confluence of the Nashua River and the North Nashua and in the midst of broad intervale lands. Those intervalles play an important role in the early process of settlement. Their value per unit exceeded far that of any other kind of land. Very often they were in quite good condition, as a result of the primitive agricultural methods of the Indian population and could be used immediately by the cattle of the new settlers. Always they were easily cleared and it was not difficult to bring them into a condition that they could yield good crops of hay. In reports on reconnaissances into the wilderness, special emphasis is always put on the occurrence and extent of these low-lying tracts of land. At present many of them are either covered by the water of the innumerable reservoirs (Figure 3) or grown up into inextricable thickets of bushes of *Alnus*, *Salix* and other plants.

In the southeast corner of the county we find mentioned the town of Mendon as early as 1667 under the Indian name of Qunshapage. To the town belonged the pre-

sent towns of Uxbridge, Northbridge, Blackstone, Millville, Milford, Hopedale and a large part of Upton. Also this town comprised relatively low land and hills on both sides of the Blackstone River. The center was located on the side of the ridge between Blackstone River and Mill River, near the intervale lands along the course of Muddy Brook.

The territory between these two early towns was a part of the then much larger town of Marlboro, incorporated as such in 1667. To it belonged what are now the towns of Southboro, Westboro and Northboro. It took in the lowland of Asabet and Sudbury Rivers and included the low hills/^{on}which the center of the town was established. Toward the west it was bounded by the rather high and massive ridge along the eastern shores of Lake Quinsigamond and Wachusett Reservoir, that was settled more than a half ~~century~~ century later than the town of Shrewsbury.

The high country toward the west belonging to the Massachusetts Upland, where large stretches of level land and broad intervals failed, remained long the abode of wandering Indian tribesmen. It was a wild country full of hidden dangers of Indian warfare. Through it led only narrow difficult trails without bridges, that were travelled by the lonely hunter or trader or by an occasional family of settlers striving toward the promised

lands of the Connecticut valley.

In the interior of the country the basin of Brookfield was one of the parts that attracted first the attention of the migrating element. The center of the basin through which the Quabaug river flows was rich in good meadow land, and the lower hills that surround it were partially cleared by the Indian tribe after which the river was named. Thus it was a region that, although isolated, was highly valuable to the pasture economy of the early New Englanders. As a result of this isolated location, about half way between the settlements around Marlboro, and the flow of immigrants that had pushed up the Connecticut valley, and far from either of them, the town had a rather difficult early existence. The first settlers came from the east, from Ipswich, in the year 1665. A town started to develop, but ten years later King Phillip's War broke out. As one of the most exposed settlements, that was also nearest to the lurking places of the enemies, the town was one of the first that was attacked. This attack had disastrous results for its inhabitants and led to complete abandonment. The majority of the later settlers came from the nucleus of population that had developed in the middle Connecticut valley. In this case again the town was located on a hilly eminence above the surrounding plains and swamps. The first meetinghouse

and stockade were built near a spring on Foster Hill.

Following this, settlers pushed up into the basin of Worcester, one of the depressions that fringe the eastern rim of the upland. A commission that was sent out by the General Court to make a reconnaissance trip into the wilderness region, describes it as a pleasant valley of good meadow land and valuable chestnut forest. Attracted by this favorable picture an early attempt at settlement was made. The first settlers built homes on the ridge between Lake Quinsigamond and the basin itself. But soon after, the settlement had to be abandoned on account of the war conditions. A considerable period elapsed before definite resettlement took place, (1713).

To follow the further spread of the population the dates of incorporation of the towns do not furnish a reliable measure. In cases the settlement of an area and its incorporation as a town succeeded each other quickly, often however there was a considerable time between the two dates. Also nearly all of the towns that were set off from other towns were settled long before this happened. Consequently it is necessary to scan town histories and other material in order to obtain definite information.

After 1700 settlement progressed rapidly. The war was over and the pressure for more and new land had be-

come strong in the older parts of the colonies. Population spread from southeast to northwest and by 1730 the extreme frontier had reached a line from Fitchburg via Rutland to Brookfield. The town of Rutland comprised Oakland, Barre, Hubbardson and the southwestern half of Princeton, and so included most of the lower part of the upland that surrounds the head-waters of the Ware River, but only the southeastern corner of this large area was actually taken up.

Later, between 1730 and 1760, followed the settlement of the higher northwestern part of Worcester county, progressing again from southeast to northwest until it reached the tract of land that is occupied now by the town of Royalston. As A. H. Bullock expresses it, "The wave of occupation seemed to pause immediately below our (Royalston's) border for some years." This last remnant of undisposed land was finally sold by auction like the odd remnants in a store at the end of the season. The town of Royalston was incorporated in 1763. So we see that settlement followed closely the lines dictated by the natural environment. The waves of human material acted like waves of a transgressing sea, covering the lower areas first and extending step by step to the higher and higher parts until the waters cover these also. When the ocean recedes, the parts last inundated are the first to emerge.

ECONOMIC BASIS OF LIFE

Worcester County is a typical inland county. As such it did not take part in the early commercial development of the coastal towns, and it lived for a long time its own life.

That life was rural. The inhabitants depended nearly exclusively on farming, and a kind of farming that was carried on under conditions entirely different from those of to-day. The people lived scattered over the whole area, each farmer in his own kingdom; the centrifugal forces of their own concerns kept them apart.

That life was difficult. Roads were bad and means of communication primitive. The narrow back of a horse or a slow ox cart were the only means of conveyance. Markets to sell and markets to buy were practically out of reach. Each farmer had to build his own home, to raise his own food, to make his own clothes and his own tools. Everything used and everything consumed went through his own hands or through those of the members of his family. The more numerous those hands were, the better things went. Every child above a certain age was an addition to the working power on the farm. Families were as large as the biological limit would allow.

The interest of the farmer centered in the microcosm of his farm and did not reach further than the macro-

cosm of the town organization. Once a week he set out on his journey to tavern and church. At times business called him to the local gristmill, the minor nucleus of the settlement. (Figure 8).

Farming itself was rather primitive. Travellers, especially those who were accustomed to European conditions, spoke about New England agriculture with a sneer, but the majority of them did not see that conditions in England or on the continent could not be taken as a measure. The economic basis of agriculture was entirely different. Here labor, except the labor of the members of the immediate family was expensive and land was cheap, there the reverse was true. No system of intensive agriculture could have flourished in this region under the original frontier-like conditions.

A system of roads existed. In 1790 the network of county roads was surprisingly dense (Figure 3) and besides there were numerous town roads. But their condition was deplorable. At first they were mere trails through the forest, along blazed trees, or paths worn out by pedestrians or horsemen from farm to farm that had been widened and cleared of the largest boulders and remnants of tree trunks. No surface hardening existed and during rainy spells or periods of spring thaw the roads were unbelievably muddy.

Within the agricultural sections no large accumulations of people existed that needed a food supply from outside. Only a few products could bear the heavy costs of transportation over the bad and hilly roads to the towns along the coast. They were pot and pearl ashes, cattle on the hoof, salt meat and cider.

As a result farming for a market occupied only an insignificant part of the business on the farm. The farmer farmed solely for the satisfaction of his own needs. From early times on, until as late as 1820 and 1830 in some sections, each town was independent and had its own interests, similar to those of all the others. Within the town the farm was economically independent. This coincidence of the areas of production and consumption persisted until the development of industries began to upset all established economic and social conditions.

The soils of Worcester County are not very well suited for the growing of wheat, the bread grain par excellence. In the early literature regrets concerning this fact abound. The various gazatteers of the time call the soils "strong" but also "cold" and humid, and although very well suited to the common grasses, not suitable for grain. Dwight travelled through Worcester County and he states that "the traveller will scarcely see a field of wheat in this tract during a journey of

one hundred miles." In 1860 wheat was cultivated only in the western, or latest settled part of the county. This seems to justify the assertion that it was the funest system of continual grain crops that made entirely impossible the cultivation of wheat. We have returns for the year 1810 of 847 acres under wheat in Sturbridge, 765 acres in Brookfield, 758 acres in Princeton, 1250 acres in Hardwick, 1014 acres in Barre, 855 acres in Petersham, 323 acres in Leominster, 296 acres in Ashburnham and 330 acres in New Braintree. But those amounts were already below the returns of 1790; Brookfield 1570 acres, Leominster 687 acres, New Braintree 520 acres and Ashburnham 681 acres. It is known that the home supply of wheat did not suffice for home consumption very early in the history of New England. Evidently the import did not reach far inland. In the interior towns rye and "Injun bread" was eaten. Dwight tells us how the bread was made and he remarks that "when a traveller from the western country sees this bread, he is not a little surprised when he is told that it is bread." Both rye, which remained important until about 1830, and corn, which still constitutes an important part of the products of the hilly lands of Worcester County, are much better adapted to the soils and climatic conditions.

Then, as now, the largest part of the corn was fed to the cattle. The raising of cattle was the most

important part in the system of husbandry. Grass is altogether the most valuable product. A grazing farm has a higher value than an arable farm of the same quality and quantity. "The hills are well suited for pasture up to their summits because water is found in them at a very slight depth. Beef and pork have long formed the staple products of Worcester County. Excellent neat cattle abound in Worcester County and beef is perhaps nowhere better fattened upon grass. Swine also abound and a great quantity of excellent pork is annually furnished for the market," (Dwight). Fruit was of early importance and cider formed an article of export.

The standard of living was low and economic conditions were primitive. Interesting in this respect are the advertisements in the newspapers of the time, as the following from a paper about 1784; "In payment received of W. Moore store in Rutland for European and West India goods: pot and pearl ashes, salts, furs, public securities, beef, pork, butter, flour, wheat, rye, Indian corn, oats, flaxseed, beeswax, old pewter and brass, etc." But soon smaller and larger breaches were to be made in this fortress of autarchy.

OCCUPATION OF THE POPULATION

Without exception the population was engaged in agriculture. Country doctors, lawyers, and sometimes even

the ministers lived on a farm and derived part of their income from their own work on it. Indeed the latter could hardly have played such a role in the improvement of farming methods, if they had not had some practical agricultural knowledge. However, after frontier conditions were over, some differentiation took place. There were nearly always a village storekeeper, a blacksmith, a cobbler, and some other artisans. But all these people were fundamentally farmers, and carried on their respective trades only when the land did not require their attention.

"Almost all the houses in the village are inhabited by men who are both cultivators and artisans: one is a farmer, another a shoemaker, another sells goods, but all are farmers." (Brissot de Warville) In the report on the industries of the United States, made by the Secretary of State in pursuance of a resolution of Congress on the 30th of March 1822, we find an account of the manufactures of Worcester County. Only 436 individuals were employed in the manufacture of cotton and woolen goods, paper and hollow ware. In connection with the quantity and kind of machinery given, and the number of workers employed, we may assume that the report covered largely those articles that were made under the factory system. This, however, does not mean that everybody worked under the roof of the factory. The industry was still in the first part of the transition from home to factory.

An article in the New England Farmer of 1824 gives us an interesting sidelight upon the real conditions. The author had found, much to his own surprise, that Worcester County had 21 cotton factories that employed 6050 hands and 25 woolen factories employing 1080 workers. A comparison of these figures with the above mentioned numbers of industrial workers shows that very probably the report of the Secretary of State included only the persons working on the premises of the individual establishments, while the last figures include those people who took part in the production processes at their homes.

The following passage in the article gives a picture of the primitive conditions in manufacturing; "the Messrs. Slater give employment to hundreds of storekeepers who send their wagons to take the yarn, colored and white, which they give out to the farmers, as far as forty miles inland where it is woven into checks, stripes, ginghams; and they are paid in West India goods, cotton yarn, etc." Such conditions make it impossible to lay down any hard and fast rule as to which part of the population is to be considered as purely of agricultural occupation, and which part is purely industrial. We know that the latter formed only an insignificant part of the total population, and that agricultural interests still predominated.

The cartogram that gives the percentage of people engaged in industry according to the census of 1820, shows this very well. (Figure 31) This percentage nowhere exceeds fifty, and remains usually below thirty, the largest part of it being made up of the numerous village artisans. The towns with a marked higher percentage are few. Leicester was a center for the manufacture of wool cards, a business started about 1785. A large number of people, mostly women and children, earned some money in this industry. Southbridge and Grafton were the places, where some of the earliest cotton and woolen factories in Worcester County were located. Sterling was important for its manufacture of wooden ware, largely chairs.

NUMBER AND DENSITY OF POPULATION

The first more complete information on the total number of people in the towns, of which many had been settled only very recently, is given by the Census of 1765. It may be that for political reasons the figures given by this enumeration are not entirely reliable, and that they remain probably below the true numbers; they are however the only figures available, and inaccuracies will not be such as to distort the picture. It is quite extraordinary to have detailed data for so early a period.

The original schedules of the Census disappeared

for many years and the only source was for a time, a copy printed in an early number of the BOSTON CENTINEL. However, the schedules were found later, and are now deposited with the archives of the State. Their respective data give an interesting picture of the stubborn passive resistance of the town authorities against a measure that they considered as the preliminary to a definite system of taxation by the motherland.

The best way to appreciate the figures of this census is to try to gain some idea of the density of population according to them. Here, however, we meet many difficulties. The changes in the town boundaries since this time have been manifold. Not only that large towns have been divided up several times into smaller ones, as for example Rutland and Lancaster, but parts of towns, sometimes of considerable size, have been annexed to other towns. To this can be added that the boundaries of most towns were not well defined in early times. The laying out of the grant in the field was rather crude. Mistakes were numerous. Sometimes one town overlapped the territory of a neighbor, and protestations, contra-protestations, and adjustments followed. Sometimes large tracts of land that could have been included were overlooked. Such an omission was for example the long narrow stretch of land between the northern boundary of

Massachusetts and the former northern boundary of Winchendon. This was allotted later to the town of Royalston, and has long been known popularly as the "Royalston Leg".

Many of the original plans have been lost, and many of those preserved are not very enlightening. Also the quite full description of the boundaries of some towns that can be found in the "Acts and Resolves of Massachusetts" were clear only for the contemporary reader. They usually progress from piles of stones to boundaries of farms of certain people, whose names and often whose farms have long since disappeared, and from there to large beech, elm, or chestnut trees, that have long since fallen before the sharp axe of the wood cutter or the strong arm of the storm. There are few tolerable, and no reliable maps that show the early boundaries of the towns. The first really accurate map is that of Osgood Carlton, published in 1801, and based on actual surveys of the towns in the year 1794.

At this time most of the important changes had already taken place. Whitney in his "History of Worcester County" gives a map of the conditions in about the year 1793, which is very inaccurate. An older map that refers to conditions as existing between 1746 and 1751 (map undated), is more trustworthy as regards the boundary lines of the towns, but the river system is far from correct, and the map has to be used with the utmost caution. How-

ever, there is a factor that is of material assistance in the reconstruction of the old towns. The boundaries of the towns were first laid out on the map with ruler and pencil and later the lines were established in the field with chain and compass, without any attention to topography; hence they were straight. Later subdivisions and annexations disturbed those linear limits, but always parts of the old lines were preserved. Sometimes evidently because the parties concerned did not believe in more surveying than strictly necessary, sometimes because the annexation or incorporation took place by farms, and the boundaries of many farms coincided partially with the town lines.

So with a careful combination of the data on old maps, those given by old records and the help given by the last mentioned fact, a reconstruction of the old town lines is possible. It cannot lay claim to absolute accuracy but furnishes a good base for the calculation of the density of population. (Figure 4 and following table) We may assume that by 1765 the population had spread widely enough over the areas of the different towns, so as not to make the calculation of the density a mere fiction.

The areas of the towns have been measured by the planimeter. As is natural the high western and later settled part shows the lowest densities. The average density of

the earlier settled lowland region is considerably higher, with Harvard and Southboro as the best populated parts. A belt of higher density seems to stretch across the County corresponding to the course of the "old country road".

For the density map of 1790 (Figure 2b) the same difficulties, although they were not so numerous, had to be overcome. This census can be considered as more trustworthy than the foregoing. The density of population varies within narrow limits. Again the difference in density between the lower part of the County and the higher upland is marked. The towns east and south of the line Fitchburg - Worcester - Hardwick have all a density above 15 per square Kilometer (or 37 per square mile). The density of the Upland remains everywhere below 15, and in its highest places even below 10 per square Kilometer. The towns with a higher density are rare. Harvard happens to have a density just a trifle over 20 per square Kilometer, (50 per square mile) and so comes in the next higher density class.

Southboro and Worcester are the only towns with an appreciably higher density. For Worcester this was partially due to the good qualities of its soil and partially to its being the shire town. Southboro belonged, as did Harvard, to the oldest settled part of the county.

Interesting and enlightening is a comparison with the cartogram that shows the percentage of the towns in use for agricultural purposes. (Figure 42) The southeastern part of the county is the best cultivated. The upland shows much less favorable conditions. A comparison of the density of population and the percentage of agricultural land in use, shows clearly an intimate connection between the two. Southboro, the town with the highest density, has the largest area of agricultural land, while both Harvard and Worcester have more than 30 percent of their area used.

COMPOSITION OF THE POPULATION population of Worcester

In the early period the composition of the population was just as uniform as were its other characteristics. The census of 1790 gives the names of the heads of families, and those names are English. However, not the entire population was wholly Puritan stock. We find several names in the census that indicate later influxes of different origin; such names as Blanchard, Balkman, Fosset, Glazier, Jourden and others clearly are not English. In the town genealogies numerous references are made to people coming from Ireland, long before the great Irish immigration began. Evidently all of the latter were Scotch-Irish, because they were absorbed entirely by the original New England stock, a fact that would not have

been possible in the case of a great difference in religion.

Many of the immigrants soon adapted their names to the English pronunciation, which makes research in this direction still more difficult. We find a record of German families taking part in the settlement of Athol, whose names became almost entirely effaced. Thus Kieberling was changed to Kibling and in the census of 1790 it was spelled Kiblingo. Hole was changed to Hall, Oberlock became Locke, etc.

TREND AND MOVEMENT OF POPULATION

The increase of the population of Worcester County was rapid between the years 1765 and the outbreak of the War of Independence. In 1765 the total population numbered 32,827 and at the last date 46,437. This means an increase of 40 percent in ten years. Such a high rate of increase was of course partially due to the completion of the settlement of the northwestern part of the county. (Figure 5)

In 1776 a break occurs in the trend of the logarithmic curve. Its gradient becomes much less steep, a fact still more marked during the following decades, until 1820, when the former trend was resumed.

Part of this decline in the increase, especially during the period between 1776 and 1790, is without any

doubt due to the war conditions. But very soon after the peace of 1783 the outflow from the New England states to the region west of the Hudson River began.

We do not have any definite information about the magnitude of this movement. Allusions to it, however, abound in the literature of the time. J. P. Brissot de Warville who travelled through Massachusetts in 1788 tells us that probably less than one-third of the land in the state was under cultivation and that it was very difficult to say when it would all be used, considering the emigration to the West and to Maine. He asserts that the taste for emigration is constantly increasing in these regions. E. Dickinson explains in 1813 the inconsiderable increase in the population during later years by the large emigration especially to the state of New York. In 1820 W. Tudor write: "The spirit of emigration acting with full force on an enterprising people easily induced them to go to new states. This constant draining from our population occasions some local disadvantage". This loss of inhabitants frightened those who were concerned about the welfare of agriculture. The New England Farmer of Jan. 4, 1823, contains a speech before the Agricultural Society of Worcester County in which serious warning was given against emigration to the West. Two years later we find in the same magazine these remarkable words: "and that we will

no longer suffer the mortification of seeing the most enterprising of our sons annually joining themselves to citizens of far countries".

This ebb of population as a result of emigration seems to have continued for quite a long time. The heaviest drain occurred before the year 1810 as the graph indicates but also afterwards it continued to take its toll from the population. We find many complaints in the New England Farmer which are most strongly expressed in the various addresses before the meetings of agricultural societies in Massachusetts.

E. Jackson in an address before the Middlesex Agricultural Society bewails the retardment of the agricultural development of New England because of the emigration of the young and enterprising to the West. He adds to this, as is typical for many of those discourses, a not very flattering picture of mid-west conditions. He speaks of the "diseases generated by the fertility of the soil" as well as of the "disastrous results of good harvests that reduce the prices to a fourth of what they are in New England".

L. R. Paige in a speech given on occasion of the Centennial Celebration of the incorporation of the town of Hardwick in 1823 states that the population has become nearly stationary for a time because of the large numbers

emigrating annually.

During the last part of this period the migration to the industrial centers, developing nearby, became more important. This movement and also the increase in the foreign immigration helped to steepen the trend of the curve again. The number of foreigners in Worcester County was still very small according to the census of 1830 and before that time it cannot have contributed materially to fill the gap in the population left by those who departed for the better western lands. After this date it increased rapidly and it was the most essential factor in making the curve resume its former trend.

The best we can do to obtain some insight into the actual number of people who left the county for the west is to make an estimate. Starting from a certain base population, we can use the average natural increases to compute the theoretical population for the following decades. During the latter part of the eighteenth century and the first part of the nineteenth, immigration was not yet so important as to influence profoundly the rate of increase in the United States. For the whole of the country the percentages of increase were:

1790 - 1800	:	35.1%
1800 - 1810	:	36.4%
1810 - 1820	:	33.1%

We shall take 35% as the average decennial increase for

the period of 30 years.

$$\begin{aligned}
 \text{When } x &= \text{the number of decennia,} \\
 a &= \text{the original population, then:} \\
 (1.35)^x a &= 2a \\
 (1.35)^x &= 2 \\
 x \log 1.35 &= \log 2 \\
 x &= \frac{\log 2}{\log 1.35} \\
 x &= + 2.14
 \end{aligned}$$

This gives a doubling of the population in about 22 years which represents the result of optimal conditions for the whole country. In Worcester County the increase during the period of eleven years from 1761 to 1776 amount to a little more than 40 percent per decennium. For the period of 14 years from 1776 to 1790 the percentage falls to 22.3 per decennium. In the three successive decades after 1790 we find the increase far below the average of the whole country. It is plain that the period from 1776 to 1790 does not represent normal conditions. The war and early emigration to Maine had affected the increase. The natural increase in the older settled region of the United States, of which New England was a part, will have remained at this time below the average for the whole country. Dickinson complained in 1813 that marriages in Massachusetts were more and more deferred to a later period of life.

However, the average for the United States is very close to the biological optimum and so the rate of

increase in Massachusetts cannot have been far below the average. In case we accept the lower rate of 32 per cent natural increase per decennium for Worcester County and take as a base the population of 1790 we find that the theoretical population in 1810 would have been about 99,000. This gives a difference of 34,000 from the actual population at that date. This number of 34,000 can thus be considered as a rough estimate of the total number of emigrants from Worcester County in the period between 1790 and 1810.

Although the changes, that made a progressive industrial area out of the rather backward region of Worcester County, where agricultural interests predominated, came rather suddenly, it is impossible to connect it definitely with a certain date. At the beginning of the nineteenth century factories were established in the southeastern part of the county. They were not numerous and the type of textile factory that had only its spindles concentrated in a central building and its looms scattered all over the countryside did not exert so disturbing an influence as the later type of plant, where every phase of the industry was under one roof.

The latter arose on the economic ruins of the former, after the long depression following the second English

CHAPTER IV

POPULATION OF WORCESTER COUNTY AFTER 1830.

GENERAL FACTORS AFFECTING THE POPULATION OF WORCESTER COUNTY

The uniformity in the distribution and composition of the population and in its occupations and mode of life changed rapidly in the decades following the first quarter of the nineteenth century. Within as short a period as the span of half a generation traces of the old order could be found only in the remote recesses of the region. Although the changes, that made a progressive industrial area out of the rather backward region of Worcester County, where agricultural interests predominated, came rather suddenly, it is impossible to connect it definitely with a certain date. At the beginning of the nineteenth century factories were established in the southeastern part of the county. They were not numerous and the type of textile factory that had only its spindles concentrated in a central building and its looms scattered all over the countryside did not exert so disturbing an influence as the later type of plant, where every phase of the industry was under one roof.

The latter arose on the economic ruins of the former, after the long depression following the second English

war. The new factories, however, did not become thoroughly established until protection extended a helping hand. From this point of view we may take the year 1830 as the beginning of the new era. Also from the agricultural side the choice of the year 1830 is justifiable. The Erie canal was opened for through navigation in 1825 and about 1830 competition of western products became serious, and New England agriculture started on its long downward path. Farming no longer paid well and certainly not at all well in comparison with what could be gained in other occupations. In the magnetic field of industrialism that spread all over New England the human material was easily dislocated from its evenly scattered habitats, and clustered around the center of action, the mill towns. The magnetic forces of industry reached even farther and immigrants were attracted to such a degree that soon they far outnumbered the native operatives. Within a short lapse of time Worcester County turned from rural to urban, from agricultural to industrial, and from Puritan to foreign.

INCREASE AND DECREASE OF AGRICULTURAL AREA

(Figures 42 to 46)

About 1820 Worcester County was still nearly entirely an agricultural region. The percentage of the area of the town, in use for agriculture purposes was, as we have seen before, not high in 1790. Since that date it had been

increasing slowly but steadily. From its very nature the process of clearing did not proceed very rapidly, but the areas of untouched, natural forest were continuously shrinking. In "American Husbandry," (1788) complaints already occur about the growing scarcity of timber in some parts of New England. In Dickinson's "Gazetteer of Massachusetts," (1813) we read again that timber is getting scarce in some sections of the State as a result of the progress of cultivation and the large consumption of wood for fuel by the cities. These complaints about scarcity, however, pertained only to those regions near the coast that were much more densely settled, that had been cultivated for a longer time, and where the relatively large city population had exhausted the local supply. Here the high and very often nearly prohibitive costs of long distance transportation of such bulky material as firewood, caused the prices to go up rapidly and thus brought home early to the consumers the disadvantages of a reckless destruction of forests.

This state was not yet reached in Worcester County, of which the hilly upland still contained important reserves of wood. However, here also the decrease in the forest area went on rapidly, more rapidly than the increase in the quantity of land in agricultural use. Surprising it is to see on the map of 1830 (figure 10) how little good forest was left by this time.

Stock raising was the most important branch of agriculture. The adaptability of the soil to the growing of grass is mentioned early by several people who travelled through this region. Dwight mentions that the fattening of beef cattle was carried on extensively in Worcester County and that also a great quantity of excellent pork was annually furnished for the market. Also considerable amounts of butter and cheese were made and sold. J.C. Gray states in the "New England Farmer," (Vol. XX, 1830, Page 121) that beef cattle make up the great staple of the interior districts and that they form, with the products of the dairies, a large portion of the remittances made by the country to the seacoast.

Also tilled crops formed an important item in the agricultural system. The cultivation of wheat was of no practical significance. Corn, rye, oats, and tame grasses occupied by far the largest part of the tilled land on the farm. These crops were necessary not only to furnish the supply of bread but still more to supply the winter feed for the cattle. In the area of tilled land we have an important criterion to judge the progress of agriculture in this region. As agricultural census statistics do not exist for the earlier periods, we have to resort to the data given by tax returns. This kind of data, of course, cannot be considered as nearly approximate to the truth as one might wish. However, a careful comparison of those data for the year 1850 with the

statistics of the first Federal Agricultural Census does not disclose any definite tendency to underestimation in the tax returns. The number of negative is about as large as that of positive differences. The way in which the older agricultural censuses were taken does not guarantee at all a greater accuracy than the returns of the assessors. Thus for comparative purposes we certainly may make use of the data given by the tax returns. Indeed, they are the only data available.

According to the tax returns we find a general increase of the area of tilled land up to about 1840. After this date the decrease sets in over the whole western part of the County, and only in a narrow strip along the eastern boundary do we still find a slight increase. The emigration to New York and the Mid-West, up to about 1830, only slowed down the agricultural expansion in Worcester County, but did not actually hinder it. This movement was draining the County of its youngest and most energetic inhabitants; in the course of time this fact was going to make itself felt.

In addition to this came the great development of the industries, with their unequal competition for the available labor supply and the resultant flow of rural population to the nearby cities and mill towns, together with the sharp competition in agriculture from the Mid-West, where newer and better lands had been developed. The hilly, not very fertile regions of Central Massachusetts could not produce

as cheaply as the level, virgin lands of the West.

In a region like the Massachusetts Upland no natural waterways existed and the cost of building artificial waterways was prohibitive. The hills and valleys trend southward, while the great market area, the densely populated Boston Basin, lies toward the east, and all travel thither has to cross ridge after ridge. Even the railroads, built as they were to serve commercial and industrial interests did not bring any material improvement, at least did not lower the costs of transportation to a sufficient degree to make competition with the West possible. Large areas were not touched by the main east-west trending lines, while all minor lines conform in their direction to the prevailing topographical features of the region.

Since the opening of the Erie Canal transportation charges were only a very minor factor in determining the prices of western products upon the eastern market. The Erie Canal had reduced the expenses of transportation to about one-thirtieth of the original costs of land transportation from Buffalo to Albany. The flow of foodstuffs from the Middle West to New England increased annually in magnitude. In the year 1825 thirty-four vessels arrived at Boston from Albany, carrying flour, grain, butter, leather, pot and pearl ashes, et cetera. In the same year Boston imported about 245,000 barrels of flour. In 1826 the Canal Commissioners

of Massachusetts wrote that the State was to a great extent dependent for flour upon sections of the middle and western part of the United States and New York.

In 1836 the imports into Boston had increased to 2,000,000 bushels of corn and 500,000 barrels of flour. In 1850 the imports of bread stuffs has increased to about 3,000,000 bushels.

Those imports reached further and further inland, and as a result the tilled area of the farms began to decrease in size. Farming, as it had always been carried on, became unprofitable, especially in comparison with the monetary rewards that could be gained in the mill towns. Wages paid to help in agriculture had always been high; now they became prohibitive. H.C. Colman gives as the reward for one day's work in the harvest season: one bushel and a half of wheat, three bushels of corn or eight bushels of potatoes. He pleads for the introduction of foreign labor on the farm. "Our own people pretend to bluster and swear a great deal about the introduction of the Irish into this country, but if our own people will not work, we must have recourse to those who will. The Irish have made all our railroads and canals, filled up all our wharves, and wherever ^u human life was to be used up without concern, there we have sent them. We have treated them with the grossest abuse and injustice, we have used them with constant contumely and contempt, we

have even stoned those who were born among us, but they are willing to work and consider labor as their destiny." But this idea did not prove to be of practical value. The number of Irish that settled outside the mill towns remained small.

We find a reflection of the conditions in agriculture during this period in the speeches made by leading men before the agricultural societies of the State. A large number of those discourses, as was the habit in that day, do not pertain to actual conditions at all, and indulge in beautified and beatifying descriptions of agriculture from the philosophical point of view. Some of the speakers, who touch the practical side of farming are unbelievably optimistic, and evidently purposely so. Only here and there reality shows through. Characteristic are the numerous attempts to prove that farming is a rational, a dignified, an honorable pursuit. Complaints about the number of farmer's sons seeking other occupations became more and more numerous. N.W. Hazen states in 1837, "Whatever praises may be offered to agriculture, there are some indications that it is not at this time the favorite pursuit in New England. Many farmers do not choose it for their children, others prefer to follow it in the prairies of the West."

The competition of the West was felt ever more, and not only in the production of corn and grains. Around 1835 beef and pork were shipped eastward through the "Notch of

the White Mountains" and a merchant in Boston who used to buy in a season about 2,000,000 pounds of pork from the County of Worcester, was beginning to obtain the same from the West and to send it from Boston inland. The number of swine and of cattle in Worcester County decreased between 1830 and 1850.

The voices clamouring for protection of agriculture became more and more numerous and the attitude of the farming class sometimes became bitter. "One-fourth comprising the commercial and manufacturing interests have more than the other three-fourths." However, it was of no avail. Agriculture had lost its place of first importance and first concern.

The decrease in the population of the farming towns, the decrease of the area of tilled land, the decrease in the number of head of cattle, did not as yet lead to the abandonment of farms and farmlands on a large scale. On the contrary, strange to say, the percentage of the area of the towns in use for agricultural purposes increased up to 1850, in some towns even up to 1885. In the "Proceedings and Reports of the Massachusetts Board of Agriculture" for the years 1851 and 1852 it is stated that since 1840, 342,000 acres have been added in the State to the improved area, and yet that grain crops have largely decreased. The explanation for this is very probably that cut-over lands and other areas were fenced and kept clean of brush, and so the pasture area was expanded only in an extensive way.

The increase in the use of labor-saving machinery made possible the performance of the same tasks by a greatly diminished number of agricultural hands. No great change in agricultural practises as a whole occurred. The inherent conservatism of the farmers prevented long an adequate specialization. Conditions became worse. Production of meat declined rapidly, and also butter and cheese succumbed to the competition from the West, and decreased rapidly in importance. After about 1890 abandonment of farms and farm lands began on a large scale especially on the high upland and on the high upland and on the poor soils of marginal economic value. Large parts of those in use for agricultural purposes have grown up into bushes and woodlands.

However, another process had started, that of the much desired specialization. In some towns, especially in those near the fruitlands of Middlesex, modern orcharding was introduced. In other towns milk farming on a larger scale started. In several towns the latter has shown a tendency to decrease again in recent years.

Although those new trends in agriculture will not result in a considerable increase in the country population, they may put a definite stop to the continuous decrease in the population of some of the farming towns.

There has been noticeable in recent years a slow infiltration of the countryside by new stock, industrial laborers who have taken up old abandoned farms and carry on part time

farming. Many of them are of Southern and especially of eastern European stock: Lithuanians, Poles, Armenians, and Finns. In some towns they already form an important percentage of the total number of farmers. On the whole their number is still small, and the farms and the shacks they inhabit are very often in a desolate condition. No too great hopes should be built on this movement.

The agricultural population of Worcester County may increase again in the distant future, but that the former degree of cultivation will ever be reached, is to be doubted and is also not desirable. Many of the soils ought to be left to the crop that will give a slow but the highest eventual return: forest.

CHANGES IN THE DISTRIBUTION OF INDUSTRIES

The early population of Worcester County was entirely self-sufficient. Not only articles for domestic use were made but during the long winter evenings, various things were manufactured, known under the general name of "Yankee notions" and sold by the Yankee peddlers all over the country. Labor-saving devices were used early in the Colonies. Each one of the towns in Worcester County had its saw mills and grist mills driven by waterpower, shortly after it was settled.

Topographically the region could not be better suited to the first use of water power. Rivers were numerous and small. Glaciation had left their stream profiles and valleys

irregular in slope and shape. Low falls furnished attractive sites for dams. Shallow, basin like hollows of smaller and larger size were common. Some of them were partly filled with water, the level of which could easily be raised. Most of them were swampy meadow tracts along the brooks in which sometimes the beavers had built a miniature pond. Boulders were abundant, a dam could be built and then the little basin above it was flooded and an artificial fall of water could turn the miller's wheel. The number of natural ponds was not large. At first the artificial ponds were small and the dams were low. Gradually, however, they grew in number and grew in size, as power requirements and engineering skill increased. The ponds and reservoirs have been the means by which man has affected most profoundly the aspect of the landscape of Central Massachusetts. (Figures 2 and 2^a)

The early mills were scattered over the whole County. (Figure 8) Each settlement had several saw mills and usually more than one grist mill. Very often the grist mill and saw mill were located on the same water privilege, either under the same roof on one side or under separate roofs on either side of the brook. Often they were owned by the same person. Little saw mills of more ephemeral life were located on the brooks in the forests. When the wood supply near them was exhausted these mills were often abandoned. Everywhere we still find the remnants of those old saw and grist mills: a

dam, half obliterated by a succession of spring freshets, a hole in the ground lined with gigantic stones and hidden by bushes and grass are all that remain.

The grist mill formed the secondary center of village life. There was at least one good road leading to it and sometimes it became a center to which many roads came. The trip to the mill was always an interesting item on the farmer's program. He went not only to exchange grain for flour, but also to obtain news from others for news supplied by himself. On the distribution of population, however, the grist mills had no appreciable influence. Very often only the owner's house was in the neighborhood; in a few cases the mill became the center of an insignificant agglomeration. Later when the main occupation of the people ceased to be agricultural, many of the grist mill sites became the places where the first factories were built. It was only then that they started to attract a larger population.

The early factories were small and scattered all over the country. (Figure 9) The economic significance and the economic consequences of the factory system were not yet fully understood. Machinery was still primitive, the amounts of capital and power required were small and factories were found at most unlikely places. The problem of distribution of the products evidently did not play an important part. Consumers were found in the immediate neighborhood and what could not

be sold to them, was brought by cart to the more important centers of population. A supply of labor could be had easily from the surrounding farms and many a daughter of a New England farmer acquired a dowry by working a few years in the mill.

Often the factory was only a part time proposition. The flow of New England rivers is rather uniform, but in the dry months of the summer the water power sometimes failed.

The mill settlements were small, even as were the factories around which they had sprung up. The house of the owner, a few other houses, a large boarding house - that was originally all.

With the development of manufacturing, home industries became less important. The farmer had to depend more and more upon agriculture only and agriculture had to furnish him cash, to buy what he used to make himself. This did not make the struggle on the farm easier. Yet for a long time some home industries held their places or took the places of those that had been supplanted by the factories. The manufacturing of palm leaf hats, of straw braid, the manufacturing of parts of boots and shoes, kept many hands in the country busy. Numerous and scattered all over the County were the shops of the shoemakers. The percentage of people in the farming towns employed in manufacturing and trades did not early decrease much.

But a process of concentration in the industries started and is still going on. Machinery became more intricate and more expensive. It required more power. Larger capital was needed to start and to pursue manufacturing. The cost of distribution of products became a more vital factor. The railroads built at a feverish rate between 1840 and 1870 accentuated this process of concentration. Smaller marginal establishments in out-of-the-way places and with small power equipment, succumbed to those new requirements. Shoe manufacturing, for example, became ever more done by machines and was ever more concentrated. The statistical tables for Worcester County for the years 1855 and 1865 show this movement very distinctly. The "tenfooters," as the small shoe shops were called, disappeared rapidly and their place was taken by a few large factories. Woolen and cotton factories increased in size and the number of small and unfavorably located factories disappeared. (Figure 9^a) The same processes were going on in other branches of manufacturing.

Some early centers of manufacturing disappeared; the surviving ones increased greatly in population. In the development of industrial towns the percentage of people in non-agricultural occupation mounted rapidly. In the farming towns this percentage fell as a result of the ultimate decline in the home industries.

This concentration of population as a result of concentration in industries has continued and is still going on at present. A comparison of the industrial census of 1865 and the quite complete "Directory of Massachusetts Manufacturers" for the year 1927, shows this strikingly: the files of newspapers for recent years confirm it.

There has been, however, a factor that has offset somewhat the influence of the aforementioned tendency of concentration of industrial population. The easy transportation made possible by excellent roads and cheap automobiles has led a large number of people employed in some industrial centers to live outside of the center itself and often in other towns. The percentage of people engaged in non-agricultural occupations in the year 1915 was high in the majority of the towns of the County. (Figure 35) Only a few remained predominantly agricultural according to the data of the State Census for the year 1925, such as: Bolton, Harvard, Sterling, Paxton, Oakham, Petersham, Phillipston. However, there is no manufacturing of great significance in many of the towns with a high percentage of people in non-agricultural occupations. The reason is that the Census figures on occupations were taken according to the place of residence and not that where the people did their work. No data for 1915 are available that could shed any side light on actual conditions. It was only possible to obtain data for the year 1927,

for a restricted number of towns, based mostly on estimates by the assessors.

In Auburn, of a total population of about 5000, 1500 earned their living outside of the town; in Berlin fifty of 1070 inhabitants; in Harvard twenty of 1000 inhabitants; in Lunenburg 300 of 1875; in Mendon two hundred of 1000 inhabitants; in Northboro 169 of 1950 inhabitants; in Oxford about two hundred of 4000 inhabitants; in Spencer two hundred of 6500 inhabitants; in Sturbridge 237 of 1850 inhabitants; in Warren fifty of 4000 inhabitants; in Westboro 300 of 6350 inhabitants; in West Boylston 250 of 1900 inhabitants; in West Brookfield eighty of 1300 inhabitants; in Boylston 75 per cent of all the people engaged in some occupation.

It is to be regretted that the total number of people engaged in gainful occupations is not known for the year 1927, nor for the year 1925. A comparison can be made only with the total number of inhabitants. The aforementioned facts indicate, however, that in case the occupations had been given by the 1915 Census in relation to the places where the people were occupied, for many towns the percentage of people employed in non-agricultural occupations would have been much lower.

GENERAL TREND OF POPULATION IN THE TOWNS OF WORCESTER COUNTY

As a result of industrialization and decrease in importance of agriculture, a differentiation that became ever

more pronounced took place in the development of the towns. From 1790 to 1830 the curves of population of all the towns are nearly parallel. (Figures 6 and 7) After this, a period of transition follows, from 1830 to 1850, in which the curves of some of the more agricultural towns linger at about the same height and in fact a few rise a little. The industrial towns show a decidedly upward trend. After 1850 a complete divergence in trend develops. Figure 6 shows two distinct groups of curves after this date: one of the purely agricultural towns, that slowly but steadily decrease in population; one of the centers of industry that increase rapidly and continuously in size. As remarked, the change in the trend of the curve does not come at the same time for all towns. In a few the decline starts as early as 1820 (New Braintree), in others like Rutland, Harvard, Petersham, and Royalston, it starts approximately at 1840; while still others as Oakham, Dana, Paxton, Hubbardston and Mendon do not show the downward movement before 1850. Also there is inequality in the development of the industrial centers. In some the development begins early. In Worcester, Southbridge, and Northbridge around 1830. About 1840 the break in the trend of the curve occurs for Fitchburg, Leominster, Milford and Webster. For Gardner and Clinton it takes place after 1850.

All the larger industrial centers, except Milford, show a rather continued increase in population. The steady growth

of Worcester stands out. This is not only the result of its position in the center of the whole region, but more especially of the great diversification in its industries. The small industrial centers that depend primarily on one very large or a few good sized plants, and where agriculture occasionally still plays an important part, show much more irregular curves. After a shorter or longer time all of them have come to a standstill. They show during later years a mainly horizontal trend with only minor fluctuations. (Figure 7) So Blackstone, Douglas and Ashburnham cease to grow after 1860; Millbury and Westboro after 1870; North Brookfield after 1880 and Warren after 1890. This seems to be the result of the steady concentration in manufacturing that has taken place, during the latter half of Worcester County's industrial development.

CARTOGRAMS AND MAPS OF DENSITY OF POPULATION

The cartogram of the density of population in 1830 (Figure 27) shows the result of the first phases of the economic and social processes that was going to upset the smooth agricultural distribution of the population of earlier times. This equal distribution, however, was still largely maintained in 1830. The hill settlements had increased in population since 1790 and their density had risen everywhere to 10 to 20 inhabitants per square kilometer (25 to 50 per square mile). Again we find a tendency to a denser population in the lower eastern part of the county, where in most towns the density

had risen to 20 to 50 inhabitants per square kilometer (50 to 75 per square mile.) There were only two exceptions - Lunenburg and Douglas. Lunenburg had a density of just a little below 20 inhabitants per square kilometer; Douglas had a very large percentage of unimprovable land, inasmuch as the whole western part of the town comprises very rocky woodlands not fit for agriculture and therefore nearly uninhabitable.

The most significant change was the rise of some of the towns to the density class of 30 to 40 inhabitants per square kilometer (75 to 100 per square mile). Worcester already had started to become the most important nucleus of population in central Massachusetts. The soils were good and a large part of the town was in agricultural use; according to the returns of the assessors in 1831 about 80 per cent. The number of dwelling houses in 1830 (521) exceeded considerably that of the other towns.

As the shire town of the county of Worcester it formed a natural center for the surrounding regions. It had a larger percentage of men in official positions and in professional occupations. Its trade was growing rapidly: in 1831 it counted 28 warehouses and stores. Its manufacturing was already important; in 1831 it had five foundries, one cotton factory, three woolen factories and two paper mills. "There are several considerable machine shops in the town of Worcester

which occupy all the waterpower, and occupy about one hundred and fifty hands." (New England Farmer, Vol. 2, p.315) This was said of Worcester in 1824. Since that date the number of cotton and woolen factories had been increasing rapidly in the county, the demand for all kinds of textile machinery became ever larger, and industries and population thrived and grew in the city of Worcester. Of all the towns in the county, Worcester showed the steepest upward trend in population.

Around Worcester we find Leicester, Millbury, Grafton and West Boylston with a higher density of population. More than fifteen card shops made Leicester an important center of card manufacturing. In addition, cotton and woolen manufacturing had started in the eastern and southeastern parts of the town. In Millbury manufacturing was already advanced. The town possessed two cotton factories and three woolen factories, a small arms factory and a paper mill.

Grafton had three cotton factories and one woolen factory, while West Boylston had four cotton factories. In the northern part of the county, Fitchburg had a higher density: there we found four cotton factories and two woolen factories. In the southern part Dudley had three cotton factories and five woolen factories. The density of population in Uxbridge was close to 30 per square kilometer. Northbridge had a very low percentage of land in use for agriculture and its density

of population of 20 per square kilometer was caused largely by its industrial activities. In Oxford the density of population rises to 32 per square kilometer, when we exclude the sparsely settled South Gore.

So we find outlined at this time in the southeastern part of the county the tendency toward greater density of population along rivers (here the Blackstone and French) that could furnish the power that was formerly supplied by human muscles.

The influence of the factories, however, was only perceptible where they occurred in larger numbers. Industrial establishments were still of insignificant size and in 1830 many of those plants were scattered all over the countryside. (Figure 9) In numerous instances they did not have any appreciable influence on the density of population.

The cartogram of density of population for the year 1860 (Figure 28) shows the conditions brought about by the rapid industrialization of Worcester County. The principal changes occurred within the period of thirty years from 1830 to 1860. Subsequent periods bring only an intensification of the process. The uniformity in distribution of population of 1790 has totally disappeared. Instead, the distribution is becoming ever more irregular. The eastern and southern part of the County have increased again in density, but in a very unequal way. The largest increase is restricted to the

towns with industrial activity; the agricultural towns have remained nearly stationary.

In the southeastern part, the valleys of the Quinebaug, French and Blackstone rivers stand out conspicuously with a higher density of population. In the northern part of the County the industrial centers, Clinton, Leominster, Fitchburg, Gardner, and Athol, are above the average. On the high northwestern upland population has remained stationary in some towns and has started its downward trend in others.

The cartogram of 1895 (Figure 29) gives only a further stage in the process of intensification of contrasts. They are strongest on the cartogram for the year 1925 (Figure 30). Worcester city is the most densely populated part of the County, and is surrounded by a belt of transition of high density. Quinebaug, French and Blackstone river valleys can be traced easily by their higher density of population and scattered over the rest of the county industrial centers stand out like Milford, Clinton, Leominster, Fitchburg, Gardner and Athol. Winchendon, Baldwinville and Otter River have developed since 1860 as secondary centers. In most of the agricultural towns the population has remained about the same, or has decreased. In Royalston, Phillipston, Petersham, Princeton, Oakham and New Braintree the density is even less than it was in 1789.

As has been remarked before the cartographical repre-

sentation of the population on a map of a large scale always has been a baffling problem. For an intensive study of the distribution of population a greater amount of detailed data is necessary than for any research problem of similar kind. To be mathematically correct, census schedules ought to be used, and the respective habitations located on the map. This of course is practically impossible, the census schedules are not open to investigation and if so, the accuracy of the results of this process would not justify the time spent on it. A clear idea of the distribution of houses may be had in many countries from different kinds of detail maps that are kept up to date. It is to be regretted that this is not true for the United States. The topographic sheets of the United States Geological Survey are very deficient in regard to the representation of the extent of human occupation of the land. Cadastral surveys do not exist for the region under consideration. As a result the only data which can be resorted to are those given on occasionally published local maps or atlases.

The representation of the periodic results of the census, therefore, can be done only by means of the cartogrammatic method. This method is more statistical than geographical and has many disadvantages. In an entirely artificial way the population is distributed equally over a certain area. It may give a satisfactory approximation provided that we are

dealing with a scattered agricultural population, but when important industrial centers occur within the same area, the result is far from accurate. At times, developing industrial nuclei are lost entirely in the dispersed agricultural population that is still predominating. At times, a few important mill towns in a larger rural area enhance the density of population in an unwarranted way. In case there is great inequality in size among the administrative units, the method is still less satisfactory.

Dot maps of distribution assure a greater accuracy, but they require more detailed data also. Without at least an approximate idea of the distribution of dwelling places, a larger scale map of this kind cannot be made. But disadvantages are also inherent to this mode of representation. In cases of great contrasts in density of population it is difficult to determine the right value for the dot. When one dot represents only a small number of people, there will be no place for all the dots in the congested area of cities, and when one dot represents a rather large number of people the portrayal of the distribution of the rural population will become too schematic. Moreover the radius of validity of the dot varies greatly; it is large where we are dealing with scattered rural settlements and small for the cluster-like urban communities. That difference is easily recognized for the larger urban centers, but it is often impossible to

recognize the small rural-industrial villages. The dot map showing the density of the population for 1855 (Figure 11) is based on the cartographic material furnished by the State surveys made under the direction of H. F. Walling previous to 1857, and on the statistical data given in the Massachusetts State Census for the year 1855.

The great inequalities in the distribution of population are very apparent. The low southeastern half of the county is much better inhabited than the northwestern upland. The great industrial centers stand out clearly. Especially the valleys of the Blackstone and French rivers and their tributaries have a dense, largely industrial population. Noteworthy also is the line of settlement along the old east-west route through Worcester County to the Connecticut valley.

A third method of representation is by maps that show areas of different density limited by lines obtained in an empirical way. These require a great amount of work, and good basic material. They are, however, much more accurate. A disadvantage is that no strictly objective method can be followed in making them, and that much is left to the author's personal judgment. This kind of map has some resemblance to the maps that show the distribution of pressure or temperature over a certain area. Also for the latter kind of map quite an important part is left to personal judgment. The number of

facts on which they are based is usually smaller than that available for the population maps. On the other hand, the changes in temperature and pressure are gradual. The density of the population is one of the most irregular phenomena existing. Areas of low density occur right beside those with an extraordinary high density. Some students of the problems have felt obliged to make a concession to the resemblance to temperature and pressure maps by interposing narrow areas of intermediate density between regions of low and high density of population. This we do not deem necessary as it is not in accord with the facts.

The maps based on the last mentioned method have been made for the years 1830 and 1855, the years for which sufficient data were available, and between which important changes occurred. They have been extended only to the northwestern part of the county. The data for 1830 cover only sections of Worcester County and of these, this region was best suited to the purpose, because in 1830 the influence of industrialization was still slight here, and later industrial and agricultural areas were in close proximity to each other. The facts are obtained from various lithographed and manuscript maps, based on actual surveys of the towns.

The most striking feature on the map of 1830 (Figure 12) is the rather equal distribution of population over the whole area. Some areas of low density occur and they may be explained

by differences in topography and quality of the soil. The northeastern corner of Lunenburg has a soil of quite good quality, but the surface is broken and the land stony. The hills in the northern and northwestern part of Fitchburg are covered by the less fertile Gloucester stony sandy loam. The southwestern part of Lunenburg where now the Shirley reservoir is found is a rather low, swampy area. Sparse population characterizes all of these sections. Merrimac loamy coarse sand and Hinckley loamy sand occupy the areas of lower density in the northern part of Lancaster and the southern part of Clinton. The westernmost part of Leominster, still belonging to "No town" in 1830, is made up of rough stony land and is nearly uninhabited. Other sections with a low density of population are the area of Gloucester fine sandy loam along the western boundary of Sterling, and the northwestern and northeastern parts of Harvard, occupied by the poor Merrimac loamy coarse sand and the Hinckly loamy sand. The regions of more dense accumulation of people, the areas colored blue on the map, are small. They correspond to the different villages.

The map of 1855 (Figure 13) shows great changes. The density of population has become much more unequal. Nearly over the whole area the density of population of the countryside has decreased and the areas of marginal fertility have been abandoned. Greater density is still found on the better soils: on the patches of Gloucester loam and Charlton fine

sandy loam, northeast of Fitchburg and east of Lunenburg; on the Bernardston silt loam and Ondawa fine sandy loam in Lancaster; on the Bernardston silt loam, Gloucester loam and Paxton loam on the top of the ridges in Harvard; on the Gloucester fine sandy loam and Bernardston silt loam in Bolton; and on the Bernardston silt loam of Redstone Hill in Sterling. The urban settlements and the villages have increased in size. Fitchburg occupies a long, broad stretch in the valley of the North Nashua river; Leominster has increased in size considerably and Clinton has sprung up as a new, important center of manufacturing.

IMMIGRATION AND CHANGES IN COMPOSITION OF THE POPULATION

For more than a century and a half the population of New England practically kept itself free from intermixture with foreign stock. Old Colonial laws restricted rigorously the possibilities of immigration. Laws against undesirables from a religious point of view were extremely rigid, and prevented for a long time the coming to New England of the types of immigrants that made the Middle Colonies prosperous. Also the attitude of the Puritan toward life, his extreme conscientiousness in matters of belief and his intolerance of others of slightly different religious convictions, did not make New England an attractive field for prospective agricultural settlers. An immigrant farmer of another national origin, speaking perhaps another language and adhering to another church,

could not expect to be adopted as member of the community on an equal footing with the others. Nor could he expect in a region like Southern New England, that was largely taken up, to be able to settle in groups of his own nationality, language and creed. As long as better lands and more auspicious social conditions were found farther westward, he would go there. The settlers tended to seek the regions of least economic resistance which, of course, were the frontier regions and not the long settled New England districts. The evidence is strong that Southern New England did not have much room to offer to additional colonists. No material increase in New England farm population took place after 1790 and the agricultural area expanded but slowly. No serious complaints were heard about the great outflow of emigrants until the agricultural competition of the Middle-West was felt seriously, and the growth of nearby industrial towns gave rise to a competition for labor that soon became fatal for agriculture. All this indicates that the optimum of agricultural population was reached at the beginning of the nineteenth century, and that the opening up of New York and the Middle West was originally a happy coincidence that relieved the pressure of population within the borders of New England.

The great change came when industry under the factory system started and proved to be successful. When the factories grew in size, they developed an insatiable demand for labor.

At first their labor force was recruited from the surplus human product of the New England hill farms; but this supply, the ranks of which were already thinned by the emigration to the West, soon gave out. As a result the manufacturers had to look about for other sources of human physical power. And here is where the policy of the leading New Englanders had to change radically and where a policy of fostering immigration had to supersede the old attitude of animosity toward it.

The geographical position of New England was highly favorable to a successful outcome of such a policy. Through its doors and through the door of its nearest neighbor, the State of New York, flowed the stream of immigrants that was swelling continuously after the Napoleonic disturbances and the post-Napoleonic period of severe reaction in Europe. Many of its components were dissatisfied farmers, to whom the industries seemed to promise what agriculture had never given them: tolerable conditions of life. Little effort was necessary to attract those people to New England and to enlist them in the army of workers that would make New England industries famous and its leaders wealthy.

Worcester County affords probably one of the best examples of the thorough-going changes in the aspect of an entire population, that an industrial revolution nearly always brings about.

As the influx was by waves, so the changes were not

gradual. This we find expressed in the percentage of foreign born people of the total population of the whole state of Massachusetts. The percentages reached higher points for the years 1855, 1875, 1895, 1910, after the different peaks of immigration. They decreased slightly in the years following, until a new wave of immigration arrived. However, these irregularities in the increase are not so large as to make it necessary to choose as dates for cartograms, that give the percentage of foreign born people, the years representing extreme high and low spots in the curve of total immigration into the territory.

The dates chosen are 1830, 1855, 1885, 1915. The intervals between them are of about equal length and they are long enough after the highest peaks of immigration that they can be considered as reflecting average conditions.

The number of foreign born people as given by the Federal Census of 1830 is very low. (Figure 36) Immigration into the United States had increased slowly since 1800, but was still insignificant in comparison with the importance it was going to take on a score of years later. Manufacturing was still in its infancy and the small plants could easily obtain their labor supply from the surrounding agricultural population. Nevertheless, we find nearly all the foreigners in the places where manufacturing was developing rapidly; in the communities along the Blackstone, French River and Quinebaug. (Figure 36) This

indicates clearly that from the beginning the immigration was purely industrial. The Census does not give any indications as to the nationality of the foreigners; and also the total number, as given by the census, does not correspond entirely with the truth. Only "aliens and not naturalized foreigners" are classified in this group. From other evidence we know that the majority of these early immigrants were either English or Irish.

By 1855 the picture has changed entirely. (Figure 37) Small numbers of foreigners are found in all but some of the most remote towns. The Massachusetts Upland with its scattered small factories and the northeastern part of the County, still predominantly agricultural, show a rather low percentage of foreigners. The majority of the foreign element is concentrated in the southeastern section of the County, in the industrial communities along Quinebaug, French River, Blackstone River, and their head waters. Clinton, a growing, isolated, manufacturing community, stands as an outpost of foreign settlement far northward. In the northwestern part of the County some individual nuclei of manufacturing were developing rapidly: Fitchburg, Leominster, Gardner and Athol. Fitchburg shows a higher percentage of foreigners than the other towns of this region and is gaining most rapidly in population. The three others, of which Athol and Gardner were slowest to develop, do not have any appreciable foreign element. This may be due in

part to their more isolated location, in part it may be the result of a larger and still sufficient supply of native labor farther inland.

Thirty years later in 1885, the picture does not seem to have changed materially. (Figure 38) The percentage of foreigners has increased over the whole County, but the contrast between the Southwestern and Northeastern portions is still pronounced. Here and there we find changes of minor importance due to a temporary and local increase or decrease of immigration. The most important of those changes are in Warren and Hardwick as a response to the development of cotton and woolen manufacturing, and in Gardner, where the chair industry had become predominant.

However, the number of foreign-born people does not give, especially for the later years, a clear picture of the composition of the population. The number of descendants of immigrants, born in the United States, and classified with the old New England stock as native-born, had been increasing rapidly since the early phases of immigration. Finally they formed, together with the foreign-born people, the bulk of the population in many towns. Some idea of the extent to which this change had gone, can be gained by adding to the foreign-born population the native-born persons both of whose parents were foreign-born. This will give us a minimum of those people who can be regarded as of foreign stock. Not counted are those of mixed New England and

foreign parentage or those whose grand-parents were foreign-born. The result of this calculation, made on the basis of the State Census for 1885, is Figure 39. It shows that the southern half of the County is predominantly non-Yankee and that only in the thinly inhabited Northwest does the original stock still form the majority. One can certainly not apply to this region, what D. C. Brewer asserts for the whole of New England in 1875 that it could still be called "Yankee land."

The cartogram for 1915 (Figure 40) shows a still greater decrease in the number of towns with an insignificant foreign element. The towns that show a larger percentage are more scattered over the county. On the whole the percentage of foreign people has not increased.

The changes in population in many of the towns of Worcester County have been kaleidoscopic, especially during the early stages of the different waves of immigration. Many of the immigrants kept wandering around to find jobs or to find better jobs. Sometimes their occupation was only a seasonal and occasional one, as, for example, the construction work in which many of the first Irish immigrants were engaged. Sometimes the factories in which they worked closed down for a longer or shorter time or laid off many of their hands when slack times came. Extremely large was the number of fires that destroyed factories and threw the operatives out of employment. And then, not having many other resources to fall back on, they had to move on once more and find work somewhere else.

The earlier immigrants were nearly all English-speaking. The number of English and Scotch was not inconsiderable, but the large majority was made up of Irish, who constitute the first great wave of immigration into the United States. There are few towns, according to the State Census of 1855 that do not have any Irish. Some of those towns are purely agricultural, and in them a minority of the Irish bought and farmed lands. On the map of the County and the towns of Worcester County of 1857 by H. F. Walling, Irish names are numerous. Most of the Irish, however, did not possess enough money to buy land with, and had to find work in the construction of canals and railroads, or as unskilled laborers in the mills. The great expansion of the railroads in New England coincided with the huge increase of Irish immigration, that was a result of the English system of extortion and suppression, and of the successive crop failures in Ireland. After the greatest part of the railroad mileage had been built, about 1850, they all began to drift into the mills, first occupying only the lower places, where rough and heavy work had to be done, but gradually replacing the old American stock by getting the better positions for which skilled labor was required, until they in their turn made place for the members of the "new immigration." After about 1890 the number of Irish immigrants decreased rapidly, and also the total percentage of the population represented by pure Irish stock has been decreasing slowly since.

Next in importance was the immigration of British American origin largely made up of people of French-Canadian descent. Although their numerical importance became greatest only after the Civil War, they belong with the Scotch-Irish and the Irish to the first immigrants. In 1855 we find the largest number of French-Canadians in Southbridge, Blackstone, Grafton, Millbury, Worcester, Spencer, Douglas, Webster, Sutton, and West Boylston, all manufacturing communities. Interesting is the history of the French-Canadians in Southbridge, where, in 1855, they formed after the Irish, the most important part of the foreign population. French names occur early in the records of different towns. We find many in the list of the names of the heads of families given by the Census of 1790. Early in the history of Worcester County we find mentioned a French Huguenot Colony at Oxford, that was however, promptly dispersed by an Indian attack at the end of the seventeenth century. A number of descendants of this old Oxford colony seem to have lived subsequently in Southbridge. Here we find before 1800 names like Allard, Graton, Chapin, Poirier, Carpentier, Dugas, and others. The immigration of French-Canadians on a large scale started only with the industrialization of the County. The immigrants came first in small numbers and without the intention of staying. During the long winter months they worked in the New England mills; during the summer time they cultivated their small farms in Canada. In

many cases the manufacturers in Southbridge advanced the money to make the long voyage to the factory by boat, stagecoach and cart. Sometimes single persons came in this way, though more often whole families migrated. Most of these immigrants in Southbridge came from villages near together in Canada. It is easy to see from this, how the system of immigration worked.

At first only a few did not join in the annual return movement to Canada: the aged and the young and independent. Gradually more and more remained until settlement became permanent, and visits to Canada were only occasional. The settlements clustered around the mills on which their life depended. The vicissitudes of the industries had marked effect on the growth of the settlements. Thus in 1845 a fire in the Columbian mill resulted in a number of French-Canadians leaving for Webster, Millbury and Worcester. In 1850 another fire in the Hamilton mill obliged several families to leave. The same happened during the severe industrial crisis of 1857. Conditions during and immediately after the Civil War suspended immigration for a short time.

It is a difficult task to determine the exact number of French-Canadians from the early records. The people who made those records usually did not understand French and in many instances the people concerned were not able to write their own names. So a large number of names was Anglicized. Some names even were literally translated into English. As examples of

this may be cited:

Bourassa	Burrows
Giard	Shaw
Aucoin	Wedge
Beausoleil	Goodsun
Taupied	Toefoot
Boisvert	Greenwood
La Croix	Cross

Immigration from British America increased considerably in later times right up to the last peak of immigration.

Scandinavian and German immigrants were not numerous in the early part of the 19th century. Only Clinton had in 1855 a considerable number of them. The great increase came after 1880, as also of the English.

Still later, around 1900, the so-called "new immigration" started. The number of people immigrating from western Europe decreased and a larger number of inhabitants of southern and eastern Europe entered. In 1885 the latter formed an insignificant part of the population: only small groups were represented in Worcester and in a few of the mill towns. By 1895 conditions had not changed very much. A slow increase had taken place, but the total percentage of people of southern and eastern Europe was still very low. After 1900 the sudden increase came, continuing right up to the outbreak of the World War.

This element in the population is much more scattered over the whole County than any of the previous classes of immigrants. (Figure 41) Numerically it is strongest in the largest towns: Worcester and Fitchburg. It forms the largest part of the total population in several of the smaller towns, as Gardner, Milford, Hardwick, Barre, Dudley and Webster. Although some of these people, especially the Lithuanians and the Poles, have settled in the country and started farming, most of the new immigrants are found in the manufacturing centers. The different nationalities are rather unequally represented in the towns. Worcester has the largest number of all the persons of southern and eastern European nationality. The Poles come first, then the Russians, Italians, Lithuanians and Greeks. In Milford and Fitchburg and Barre the majority of the new immigrants are Italian. In Webster, Dudley, Hardwick, Clinton, Gardner, and Southbridge the Polish element predominates. Both Gardner and Athol have strong Lithuanian elements.

Of the western European, but not English immigrants, the Swedish are largest in number in Worcester, while the Finnish are best represented in Fitchburg, Worcester and Gardner.

The diagrams (Figures 47, 48, 49 and 50) give a picture of the development of the population in the towns of Webster, Clinton, Blackstone, and Barre. The colored areas represent only the foreign-born population of a certain nationality.

The statistics do not give information on the number of people born in the United States, and of pure foreign stock, except for the years 1895 and 1915, for which the number of native parentage (both parents foreign) plus the number of foreign-born is represented on the diagrams by the dashed lines. These lines come closer to representing the true composition of the population than those giving only the number of foreign-born people. Everything above the highest dashed line is mixed foreign stock, mixed foreign and native, and pure native.

Down to the Swift River depression. The average altitude of the town is about seven hundred feet. In this regard Dana differs from the other towns that show the same progressive development. The majority of them are situated on the high upland. In most other respects, however, conditions in Dana are essentially the same.

It is far from the larger centers, and modern roads of travel leave it untouched. The railroad that crosses the extreme northwestern corner of the town is a single track branch of the Boston and Albany Railroad, on which traffic is insignificant.

A high spur of the upland, comprising Whitney Hill and Pottapung Hill runs from the northeastern boundary of the town southward. On both sides of this central high part we find rather level sandy uplands of glacial lakes and outwash plains, extending

CHAPTER V

TYPES OF DEVELOPMENT

A TOWN THAT HAS GONE DOWN HILL

One of the towns that have been declining slowly but steadily since the first half of the last century is Dana, Massachusetts (Figures 14 and 15)

The town lies in the western part of Worcester County, where the Central Massachusetts Uplands slopes down to the Swift River depression. The average altitude of the town is about seven hundred feet. In this regard Dana differs from the other towns that show the same retrograde development. The majority of them are situated on the high upland. In most other respects, however, conditions in Dana are essentially the same.

It is far from the larger centers, and modern roads of travel leave it untouched. The railroad that crosses the extreme northwestern corner of the town is a single track branch of the Boston and Albany Railroad, on which traffic is insignificant.

A high spur of the upland, comprising Whitney Hill and Pottapaug Hill runs from the northeastern boundary of the town southward. On both sides of this centrally located higher part we find rather level sandy deposits of glacial lakes and outwash plains, extending

eastward to the base of the hills of Hardwick, Barre, and Petersham, and westward to a high ridge of roche moutonnée like, ledgy hills along an axis of more resistant Brimfield schist.

The soils are not of the most promising kind. Areas of rough stony land occur in all sections of the town. The largest percentage of the soils of Dana consist of Gloucester stony fine sandy loam and Merrimac loamy coarse sand. The two nuclei of settlement, North Dana and Dana Center, stand on small areas of slightly better soil, the Merrimac gravelly sandy loam.

Dana became an independent town later than most of the other older towns of Worcester County. It was entirely made up out of parts of towns that had been settled and incorporated before: Petersham, Greenwich, and Hardwick. The motive for the incorporation was the same as that which led to the dividing up of a great number of the large towns: the unfavorable natural features that prevented easy communication with the town center.

The land is hilly and the roads were bad, mere trails from farm to farm. The means of communication were slow and uncomfortable. The centers, where relief could be had in church or social gathering from the utter monotony of the work in the treadmill of farm life, were far away. The need for a meeting point within easy reach

had created a local center long before any definite move was made toward municipal independence. That center was at what is now the village of Dana. Here stood an old Baptist church that had been moved hither from Petersham. Here was a store, a tavern, a tannery, a blacksmith shop and a potash manufactory.

Finally the surrounding towns and the General Court of Massachusetts yielded to the desires of the habitués of this center, and a separate community was established with its own meeting house. Due to the existence of this early nucleus, people decided to meet here for social and religious purposes, rather than establishing a new meeting house at the mathematical center of the town, as was usually done.

Though arisen from identical needs of the inhabitants, it was soon evident that the township, as incorporated, was not a natural unit. The spur of the upland, that was traversed by only one road at its lowest place proved to be an obstacle that emphasized the eccentric location of the place, where all the interests of the town were supposed to focus.

The waterpower in the northwestern part of Dana, on the Middle Branch of the Swift River, seems to have attracted attention in early times. Before the incorporation of the town a mill existed here, of which the

remains are buried now by the waters of the Neeseponset Pond. The mill seems to have been abandoned early. Later a grist mill and sawmill were built, evidently not exactly on the same spot. When the wave of industrialism that passed over New England reached the interior in which Dana is hidden, this place became one of the small centers of manufacturing that have been so numerous in Worcester County.

About 1840 we find the village of North Dana developing here. Very soon it became a serious rival of the older center. When agriculture started on its long and slow way into decadence and industries came to the foreground, the strife, that had been going on continuously since the establishment of the town, between the parts East and West of Whitney Hill, was settled in favor of North Dana.

In the first decades of its existence Dana was almost exclusively a farming town. About ten years after its incorporation the town was still very thinly inhabited. The total number of houses did not exceed 82. The tilled land extended over 225 acres, 300 acres were in pasture and 203 acres in English and upland mowing. The amount of cleared land was extended gradually. The population increased very slowly. By 1830 the number of houses was 101. The tilled land comprised 544 acres, and there were

2062 acres of pasture land and 481 of England and upland mowing.

The peak in the agricultural development was reached before 1850. After this time the area of pasture land continued to increase. The amount of tilled and land ^{and} the number of cattle, however, decreased gradually.

In the later years of the 19th century and the first part of the 20th, an actual process of abandonment set in and became more and more pronounced. T. S. Johnson stated in the historical sketch given on the occasion of the Dana Centennial celebration that the soil had become so exhausted as to make its cultivation unremunerative. "A process of abandonment has been going on until forests abound." However, it has to be said that Dana was never extensively cleared. It is doubtful if ever more than 50 percent of the area was in use for agricultural purposes.

A slight upward tendency in the general downward trend of the population curve has been given several times by the industrial activities carried on in the northwestern part of the town. Originally manufacturing was diffused all through the town, as home industries. Cotton cloth was woven, card teeth were set, and the rye that was cultivated extensively gave the original raw material for the braiding of straw and the manufacturing of hats.

In 1837 the industrial production of the town was

still insignificant. Shoes, palm leaf hats, and tannery work are the only items mentioned. In 1845 a factory for the turning of piano legs was established in North Dana. The business seems to have been quite prosperous after 1850. In 1855 two existed, employing about thirty hands.

This seems to account for a slight increase in the population. The decrease set in about 1860 and continued to 1885. In 1880 a woollen factory was established. In 1889 the factory employed about thirty hands, a number that seems to have increased slightly since. This factory accounts for the upward trend in the population after 1890. A definite decrease set in again in 1900. The increase shown by the census of 1925 is caused probably by a hat factory that has been running for a couple of years. The 1930 census will, without doubt, show another important decrease. As conditions are at present, Dana is a good example of one of those purely agricultural communities that have been decreasing almost continually in population since the middle of the last century.

Far from the great centers of modern life, untouched by the highways that cross the interior of Massachusetts, it gives rest and peace to the aged and to those who choose to live here. It could not and it cannot offer any bright prospect to the youth. The more

energetic young people abandoned the town long ago. According to the State Census of 1905 those between the ages of 15 and 30 make up more than 30 percent of the population in the cities of Worcester, Fitchburg and Clinton. For Dana it is 20 percent, for Petersham 19.7 percent, Royalston 22.7 percent, Brinceton 22.6 percent, Westminster 20.0 percent. People about 50 years of age make up 13.5 percent of the population of Worcester while they form over one fourth of the population of Dana.

As we have seen before, the percentage of the area of the town of Dana that has been in actual use for agriculture, has never been very high. However, it has been much larger than it is now. Everywhere over the town we find old farm lands in all stages of abandonment. Sometimes we find only old, worn out grass lands that have not been reseeded or manured for years. In the fall of 1927 many of those fields, with their bunches of high, dried out stems of *Andropogon*, looked as if they had not been mowed or used for grazing at all. More numerous still are the fields where *Solidago* and *Spirea* have conquered most of the territory. But still further does the process of reconquest by nature go. *Myrica* and different kinds of *Vaccinium* come in. After that *Betula*, *Acer*, and *Quercus* follow, and the sweet fern and blueberries are restricted to areas of short underbrush and are sometimes

crowded out entirely. In many places Pinus comes in. In some sections it has already formed dense and rather pure stands.

The survey of the forests of Worcester County made under direction of the Massachusetts State Forester in 1916 showed 67 percent of the town covered by forest. The different forest types were divided as follows:

Chestnut	8 percent
Oak	4 percent
Chestnut and Oak	4 percent
White Pine	32 percent
Hardwoods and White Pine	31 percent
Maple and Gray Birch	13 percent
Other softwoods	8 percent

On many of the rockier soils *Juniperus* forms conspicuous phase of the succession.

Old, abandoned or nearly abandoned roads lead over the tops of some of the hills. Often in the midst of woodlands of birch, maple, oak and pine, as old and crippled apple tree appears, to bear witness of former human activity. A search sometimes reveals more of those, half starved and squeezed to death by the upshooting natural vegetation. Some little patches of grassland framed by boulders, are occasionally mown by a farmer miles away, others have finally been abandoned as too far away,

and bushes abound in them.

A hole in the ground, lined with masonry and often partly filled with bushes, or tall saplings that have found a foothold between the stones, a few old beams, and some slabs of slate in a hidden, grass overgrown corner, are all there is left of those centers of human activity.

Peregrinations in parts of the town over roads where no automobile can pass, where a farm cart would have to be careful not to stick in the mud and where even the pedestrian must travel with care, give an impression of utter desolation. They tell the person, who is inclined to attach too much importance to the works of man on earth of their inherent fragility.

Of the farms that are left only a few can really bear their name. No modern orchards exist and the few remaining farm orchards are in bad condition. There are no large dairy farms and only in one place is trucking carried on. Many of the farm houses are used as summer residences and most of the farmlands of the summer residents are allowed to run wild. On others only the old folks are living, letting the country around grow up into bushes, and keeping one or two cows where there were formerly 20 or 30. Sometimes even the grass on their own fields is not mown because it is cheaper to buy the

hay.

The map that shows the number of abandoned farms is as accurate as an actual survey in which all the roads were covered on foot, can be. Many of the black dots are only cellar holes, others again are houses that were once farms, but that are inhabited now only during a short time of the year as summer residences, or in which the people are living most of the year, but without carrying on any agriculture. Some cellar holes are without any doubt really duplications. Sometimes a house was abandoned and a new one built by the same person on the other side of the road, or close to the old house. A small number of cellar holes may have been overlooked. On the whole, however, the map shows clearly the extent of the process of abandonment.

It is difficult to estimate in the field how much of the land has been incultivation formerly, how much has been used as cleared pasture, how much as bush pasture, and which part has been only cut over land on which the natural vegetation was allowed to run in immediately. Often stumps of old trees or ledges and boulders tell that the land certainly has not been tilled. But that is the only information field work can give. The cleared fields are mapped as accurately as can be done with the use of the topographic map, and without instruments.

The insignificant area of the good fields in actual agricultural use is striking. The area covered by tall bushes of birch, maple, oak and young pine growing on lands that were used once either for tillage or for pasture, is much greater than the areas shown on the map. Limited time and practical difficulties prevented a more truthful representation of those areas.

The brightest spot in the future of Dana is that very probably the largest part of the town is going to be used by the Metropolitan Water Works for the new Swift River Reservoir. The lowest part will be flooded, the higher part probably will be needed as protected watershed.

This prospect has not yet had much influence on the actual number of inhabitants. In the fall of 1927 only a few houses in the southwestern corner had been abandoned in view of this coming event. Within a short time, however, it is going to make itself felt, and then the number of inhabitants will decrease rapidly.

	Tillage	Pasture	Hay	Eng. and Upld. Mowing	Houses
1811	225	301	401	203	82
1831	544	2062	702	481	101
1851	491	2272	990	639	157
	Horses	Oxen, Cows etc.	Swine		
1811	67	317	137		
1831	79	668	108		
1851	121	608	87		

1924: 48 farms
 45 acres of corn
 880 acres of hay
 114 cows

A TOWN WHERE AGRICULTURE HAS BEEN STARTED ON A NEW BASIS

Some of the farming towns in Worcester County seem to give promise of escaping the fate that has fallen most of those towns in the more remote and higher parts of the region.

These are the towns where the more specialized types of agriculture, the only kinds that can thrive under the present economic conditions, have been introduced. It is especially true for some towns where fruit growing according to modern methods and on a commercial basis, has been stated recently. This new development will not, of course, lead to a marked increase in population in the towns concerned, but it will prevent in any case further depopulation. It will give to those towns a more lively and prosperous aspect, and efface the marks of economic decrepitude that so many of the hill towns bear.

As an example may be taken the town of Harvard in the northeastern part of the County of Worcester. (Figures 16 and 17) Harvard belongs to the belt of hilly lands that surround the Boston basin. It occupies one of the highest parts of this region. The ridge that

extends from Shrewsbury northeastward, crosses the southeastern half of the town and reaches an elevation of 630 feet in Oak Hill. A secondary ridge, somewhat lower, runs parallel to the first in the western part of the town, but disappears rapidly toward the transverse depression of Ayer. Toward the west the town is bounded by the Nashua River, flowing through the depression that separates the eastern hilly region from the Massachusetts upland. Its northwestern corner consists of morainal hills and the sandy terraces of the glacial Lake Nashua. Through the town flow a few insignificant brooks, that were unable to give rise to manufacturing of any consequence.

There is some good soil in the town, especially on the tops of the two ridges. Here we find Gloucester loam, Bernardston silt loam, and Paxton loam. Patches of Gloucester fine sandy loam and Charlton fine sandy loam occur. The slopes and the lower areas are for the largest part covered by the Gloucester stony fine sand loam, that is less well suited to agriculture. The northwestern corner of the town is occupied by infertile sandy soils, and a large area of muck land. Much occurs also in the northeastern corner of Harvard near the old Shaker Village and along Bowers Brook.

The town of Harvard was originally a part of Lancaster. Although it was not incorporated until 1735,

there were early settlers before that time. Several families were living in this corner of Lancaster about the year 1704. Then stockades were still necessary to give protection in case of Indian raids.

Since that time the town seems to have developed rapidly. About 1730 it contained fifty to sixty families, with a total of 325 people, scattered over the best sections of the town. The church was located near the mathematical center of the town; no houses were as yet built around the common. There were only two or three dwellings within a distance of a mile. In 1765 there were 153 houses and the total number of inhabitants had risen to 1126. At this date Harvard belonged to the group of towns with the highest density of population. The number of houses during succeeding years was 163 in 1771, 165 in 1786, 179 in 1791. Also in 1790 the density of population was considerably above the average for Worcester County.

The area of cleared and cultivated lands increased gradually with the population. In the valuation returns of 1771 we find that an area of 942 acres is occupied by tilled lands; 728 acres are in use for English mowing, 1346 acres for meadow and 1320 acres for pasturage. Different kinds of grain, and hay, flax, hops, potatoes, turnips, beans, etc. were grown. From early times Harvard has been known for its good apple orchards. Various

gazetteers mention the fact, as among others the "Gazetteer of Massachusetts" by Spofford (1828). It states that the soil of Harvard is especially suited for fruit and that it is surpassed by none in the vicinity. Export of the apples to other towns was impossible; the product was too bulky and costs of transportation were prohibitive. The largest part of the production was consumed at home, either as fresh fruit or in the form of dried apples or cider. Cider forms an important item on the valuation lists. In 1771, 1554 barrels were made. Part of this seems to have found a market in the towns around the Bay.

The War of Independence stopped for a short time the progress of the town. In the valuation returns for the year 1786 we find that the number of dwelling houses has increased only by two and that the area of tilled land decreased from 942 acres in 1771 to 877 + in 1786. The apple crop of course, was not affected by abnormal post-war conditions and the demand for cider does not seem to have decreased: 2190 barrels of cider are on record for the year 1786.

During the next decades the growth of the town was slow. The number of houses increased from 179 in 1791 to 198 in 1811, and to 209 in 1830. The amount of tilled land did not increase in all those years. It remained

about 850 acres, up to 1850.

We can obtain an idea of what was cultivated from the valuation returns for the year 1811. Corn is the most important crop with 8622 bushels. After this comes rye with 1627 bushels. Also a little wheat is cultivated: 391 bushels. In the course of time rye decreased in importance. Evidently the "rye and Injun" bread was slowly replaced by the bread made from imported wheat flour. About 1850, oats was the crop next in importance to corn.

The facilities for grazing were rapidly becoming better throughout the whole period. The area for pasturage increased as the deforestation of the town progressed, from 1320 acres in 1771 to 2476 in 1786, 3560 in 1811, 5312 in 1830 and 6211 acres in 1850. This increase, however, was not attended with a similar increase in the number of cattle. In the first half of the 19th century cattle were raised for beef. When the cheaper western beef came in, the number of beef animals, began to decline. This started about 1840. In 1850 Harvard has become an important producer of butter: 107,765 pounds were made in that year according to the original returns of the U. S. marshals for the Federal Census.

After 1850 the agriculture of the town declined in importance. All crops, except hay, decreased in quantity.

	Wheat	Rye	Corn	Oats	Barley	Hay
1850	359 bu.	1465 bu.	9766 bu.	5595 bu.	976 bu.	3125 tons
1875	10 bu.	433 bu.	7229 bu.	754 bu.	221 bu.	3835 tons
1895	-	10 bu.	18880 bu.	-	-	?

The number of cattle dropped from 1268 in 1850 to 812 in 1875. The amount of butter made decreased to 18,554 lbs. However, milk took the place of butter: 345,323 gallons were produced in 1875. Hay, milk and apples were the main products in that year, arranged according to their value.

During the thirty years before 1850 the population of the town had remained stationary. The natural increase was leaving constantly for better agricultural areas or for the cities. This meant that the town was drained continuously of its younger and more energetic inhabitants. About 1850 a long period of decrease started that continued to about 1895.

The amount of water power that the town possesses is not great. It has been sufficient to furnish power for grist and saw mills, and fulling and carding establishments. It was too small for factories of any size. Some boots and shoes were manufactured in Harvard before 1860, as in most of the other towns in Worcester County. In 1837 and in 1855 about twenty-five hands were employed; in 1865 only nine. There was some manufacturing of

paper, that decreased in importance and disappeared finally. Household industries, as the making of palm leaf hats and brooms occupied the farming population during a part of the year. But those industries were of little consequence. They disappeared altogether when concentration in industries set in and very soon Harvard became again a purely agricultural town.

As a result of the little importance of manufacturing Harvard never obtained a large contingent of foreigners.

During the decline in agriculture the apple crop held its relatively important place. In 1885 there were five orchards that could produce 1000 barrels each in a favorable season. From 25,000 to 35,000 barrels of apples were shipped from Harvard during good apple years. Most of them were sold to Liverpool. The apple crop was, however, decreasing in absolute quantity. In 1875 34, 215 bushels were produced, in 1885, 24,014 bushels and in 1895, 19,808 bushels. The orchards were mostly of small size, so called farm orchards. The trees were old, no sufficient care was taken of them no replanting took place.

In 1893 H. S. Nourse could write in his "History of Harvard": "Harvard affords a fair example of that tendency to decadence in population and industrial enter-

prise which is emphasized by each Census-that steady numerical decline which seems to threaten the abandonment of those hill towns which lie at some distance from any great thoroughfare or which have no water courses furnishing steady power for large industrial enterprises. The native youth goes away to the centers of industry and commerce and imported hirelings stand in their place, but cannot make good their loss."

During the recent years, however, Harvard has entered upon a stage of revival. The old farm orchard had played its part. A new type of purely commercial orcharding started to develop in the town. This was really a result of the extension westward of the orchard belt in Middlesex County of Worcester. At present Harvard has the largest number of apple trees of all the towns in the County. About 40 percent of the trees are of non-bearing age. The planting of commercial orchards of any extent started after the year 1910.

Number of apple trees in Harvard

	Trees of bearing age	Trees of non-bearing age	Total
1875	-	-	26990
1885	-	-	27717
1895	-	-	30585
1905	21878	1527	23405
1924	20864	14194	35058

The decrease in the total number of apple trees from 1895 to 1905 is easily explained by the decrease in importance and the abandonment of many old farm orchards.

Harvard has always been one of the towns that

had a rather high percentage of the area used for agricultural purposes. Only the northwestern and northeastern corners are regions with poorer soils that are not so well suited to agriculture. Nevertheless the number of abandoned farms is astonishingly high. The process of abandonment has not gone so far as it has in Dana. Harvard is not far from the great centers of population. Its transportation facilities are better than those of Dana. Good roads lead northward to Ayer, southward to Clinton. A double track line of the Boston and Maine Railroad crosses the northwestern part of the town.

Only a few stretches of road have been discontinued. A trip over some of the secondary dirt roads, especially in the northeastern and southeastern sections of the town, gives impressions of desolation. Unoccupied farmhouses and neglected and abandoned fields are legion. The part of Harvard northwest of the railroad has been abandoned entirely except for one farm just across the tracks. It has formed since the war a part of Camp Devens. Here desolation reigns supreme. Fields that are growing up into woods, barns falling into decay, and houses with paneless windows and doors slamming in every gust of wind are the only remnants of human activity. In the northeastern part of Harvard the once

flourishing colony of Shakers is now nearly abandoned. Only a little cemetery with many rows of uniform stones bears witness to all those who once made out of this ungrateful soil one of the best tilled parts of the town.

But amidst those scenes of death, new life is growing up. The inspirational note that we read on the bulletin board of the little church on the common, that it is never too late to start a new life, also holds true for the community as a whole. As we have seen, Harvard has always been an orcharding region. Small farm orchards, often with old, sickly looking trees, can still be found scattered over the town. Sometimes they are entirely abandoned; sometimes the fruit still serves for home use. But new orchards have been planted with young and healthy trees and they give a product that can compete successfully on the market. The commercial orchards are all on the tops and slopes of the ridges, where the better soils occur and where the advantage of good air drainage is assured. Some of them are of a quite large size. Gloucester loam and Paxton loam have the best orchards.

This new development of course, will not result in a definite increase of population. It will, however, prevent any further large decrease. Although orcharding

may not be feasible in all parts of the town, a thriving agricultural development in one part will certainly affect the town as a whole, and give it a more lively and flourishing aspect.

TOWN OF HARVARD

	tillage	pasture	Eng. and Upld. mowing houses	
1771	942	1320	728*	163
1786	877	1840	755*	165
1791	844	2476	794	179
1811	742	3560	1162	198
1831	843	5312	1486	209
1851	847	6211	2672	260

*only English mowing

1924: 116 farms

223 acres of corn

3009 acres of hay

516 cows.

A RURAL COMMUNITY INFLUENCED BY A DEVELOPING URBAN COMMUNITY

Large, developing cities have usually a profound influence upon the surrounding towns. In its first phase this influence is felt only in the economic activities of the town. As a result of its nearness to the great center, some of the roads that cross the town are in excellent shape. Transportation by motor is easy and

cheap. Also railroad connections are usually good. The farmer can specialize in products for which a large demand exists in the city. Dairy farming, poultry farming and especially truck farming become lucrative. Population grows slowly.

In the next phase of development the residential districts of the growing city invade the town. New streets are laid out and new houses are built. Population increases rapidly. The means of communication with the city become better and more frequent. Bus lines, trolley lines, subways are established and the town has become actually a part of the city. Sometimes the growth of such a smaller neighboring community is started or enhanced by the establishment of suburban industries. In that case the two communities grow some what independently until they unit like merging oil-stains on a piece of paper.

Worcester County does not have any very large cities. The later stages of extension and absorption as described above, are not found here. However, the developing city of Worcester has started to exert a considerable influence upon the surrounding towns. Dairying and trucking for the Worcester market is carried on in Paxton, Leicester, Auburn, Shrewsbury and West Boylston. Residential settlements belonging to the sphere of

influence of Worcester City are found in West Boylston, Shrewsbury, Millbury, Auburn, Leicester and Holden. The trend of population in all these towns has been determined for recent years, in a certain degree by the trend of population in Worcester City.

The town in which development has gone farthest is Auburn. (Figures 7, 18 and 19) The sharp rise in the curve of its population after 1900 indicates when this urban development set in.

Originally the town was a typical agricultural community. The density of population and the number of people employed in manufacturing has been low for a long time. Even as late as 1865 the percentage of the latter remained under 30. Also the percentage of foreign-born people was considerably lower than that of the surrounding towns for a number of decades. In 1837 we find mention of one woolen factory. It was, however, not in running order. Some boots and shoes were made. This industry employed about 34 persons. In 1855 two cotton factories were running, employing about 70 hands. In 1865 the Auburn Woolen Mill employed 18 hands, and the Stoneville Cotton Factory 75 hands. The foreign mill population consisted chiefly of Irish and French-Canadians. Only after 1900, when the influence of Worcester became felt, was there a great increase in the number of foreign-

born inhabitants.

Number of foreign-born inhabitants in Auburn				
	1855	1875	1895	1915
Gr. Brit.	15	10	88	143
Ireland	137	119	74	75
Canada	27	174	193	257
Sweden			69	228
E. Europe				91

The town was mainly agricultural. The population was distributed rather evenly over the whole area, except in some places, where areas of rough stony or swampy land occur. Auburn Center was an agglomeration of a few houses on the top of one of the hills. Pondville and Stoneville were small rural-industrial settlements. In Stoneville the majority of the factory hands lived in two rows of company-owned houses at both sides of the road. In Pondville they lived in a small number of multiple-family houses.

After 1900 conditions changed rapidly. The City of Worcester had been growing southwestward and at about this time it penetrated with one of its many tentacles into Auburn. The northern part of Auburn became one of the residential sections of Worcester and the population curve of the town made suddenly a steep upward bend. Roads were laid out on the ridge running south-

westward from Pakachoag Hill as early as about 1895. Many houses have been built here since. This section, however, is not growing as rapidly as that north and south of Stoneville. A large number of buildings all of residential character have been built recently, especially on the hill south of Stoneville. Some stores have appeared. The prices of land on the northern part of the hill seem already to have increased so much that houses for two and more families have been built. Southeast of Auburn Center and near the end of the West Auburn trolley line two other centers are starting to grow up. The street car line to West Auburn is one of the few interurban lines that have not succumbed to the bus lines.

There are left in the town few farms on which agriculture is carried on for subsistence. There are a couple of large dairy farms and a good sized orchard. Truck farming is done in several parts of the town, as for example on Prospect Hill and West of Long Pond. The majority of the houses, scattered over the town, are occupied by people who have their work in Worcester. They carry on some farming at the same time, but only for their own needs. There is usually a vegetable garden and a small home orchard. Often one or two cows are kept. The available pasture, however, is not large, and always additional food for the animals has to be bought.

The industrial activities in the town have decreased in importance. One of the mills is still running, but employs only a small number of people. The other is all but idle and the larger portion of the houses owned by the company are not occupied. As part of the plant has been bought by a concern that runs a similar but larger factory in another state, it is not likely that the factory soon will work at full capacity again. In case Worcester continues to grow it is very likely that in the not-too-distant future Auburn will be annexed to it.

URBAN-INDUSTRIAL COMMUNITIES

After the introduction of the factory system, the perfection of machinery, and the increase in the size of the plants, some of the towns most favorably located for manufacturing began to increase rapidly in population and to extend their urban area.

Two distinct types of urban community were the outcome of this process of development. The first type, to which most of the smaller manufacturing towns belong is that the welfare and growth (of which) depend on one or (at) most a few industrial establishments of large size. To this category belong among others Millville, Hopedale, Clinton, Gardner, and Leominster. Millville depends on the Woonsocket Rubber Company, Hopedale on the Draper

111

Corporation and the Hopedale Manufacturing Company, both of which produce textile machinery.

Clinton is largely dependent on the Lancaster Cotton Mills and the Bigelow Carpet Company. Gardner is the city of the chair industries, and Leominster of celluloid articles.

To this type belong also the small industrial centers in towns in which agriculture still plays a part, like Gilbertville in Hardwick, East Douglas in Douglas, etc. The majority of those small industrial settlements, however, belong to a group that is not distinctly urban, and that can be classified as rural-industrial.

The second type of urban-industrial community is usually larger. The fortunes of the community are not bound up with those of a single plant or a single industry. They have a large number of different kinds of industries, with plants of all sizes.

The cities of Worcester and Fitchburg belong to this type. Clinton and Worcester are representatives of respectively the first and second type, and may be considered as good examples of the rapid and sometimes spasmodic growth of the manufacturing towns in Worcester County.

Clinton was for a long time a part of the larger

town of Lancaster. This town, incorporated in 1653, was the oldest and for a long time the most important town near the Massachusetts upland. When Worcester County was established in 1731, Lancaster ranked first in population and wealth. Even in 1765 Lancaster was only second in number of inhabitants, Sutton, with 2120 inhabitants being the largest community in Worcester County.

In the course of time, however, many parts were set off from the mother town as independent units. As a largely agricultural community Lancaster soon decreased in relative importance and some of the towns that once made up a part of its area, Leominster and Clinton, have since grown far beyond it. Clinton, incorporated in 1850, was the last section that was set off from Lancaster. Long before this date, however, it had developed as a center of manufacturing; as such it was different from the rest of the town that was predominantly agricultural.

Already in 1654 a grist-and-saw mill was built by the first settler, Prescott, on a little brook that runs into the Nashua River. The mills were located near the present crossing of Main Street and Water Street, where a fall of more than twenty feet furnished the power. The first house was erected on the slope of the hill close by. These mills were long a center for the whole surrounding

region. Soon roads to the north, east, west and south were established and farmers from the northern part of Lancaster, from Bolton, Berlin and Sterling and even from some of the towns in Middlesex could reach the mills as easily as the state of those primitive roads would allow.

About 1750 not more than fifty people, on less than twelve farms, were located on both sides of the Nashua River within the present limits of the town of Clinton. In later times when more mills were built, the Prescott mills retained only local importance. On the map of Lancaster of 1794 the mills are represented. Two more mills occur on the Nashua River near the North Village. A few small saw mills are scattered over the town. Near to the present location of the Lancaster Mills there were falls seven feet high. This site was not used for a long time, until finally a dam and mills were built here after 1810.

In the beginning of the nineteenth century industries became more and more important. The making of combs was carried on, especially during the winter time when the land did not require labor. It was still entirely in the stage of the home industry. Either the barn or a separate building was used for a shop. In 1826 fifteen or sixteen of these shops were in existence. After that time a concentration in the comb industry took

place. In 1837 there were only six shops left, employing 49 hands. In 1855 two establishments for the manufacturing of combs are mentioned, employing together 50 hands. The comb industry was not destined to develop Clinton into an important center of industries.

In 1809 one of the first cotton factories in Massachusetts in which all phases of manufacturing were carried on under one roof, was established at the water privilege of the old Prescott mills, north of the present Winter Street. The old buildings were torn down and a factory put in their place. This early cotton factory was of very modest size. In 1819 it contained only 900 spindles, and for a number of years not more than a score of people were employed, the majority of whom were women. Few of these were natives of Lancaster. They were daughters of farmers from the surrounding towns. First a boarding house for women was constructed and later one for men was built.

In the course of time another water privilege higher up on the brook was purchased. A second mill was erected and 32 looms were put in. Some cotton manufacturing was also carried on in a room of the saw and grist mill near the falls in the Nashua River. About ten people were occupied there.

The distribution of the goods was just as simple

and primitive as the manufacturing processes were. Once a week the finished articles were sent to Boston by cart. Cotton for the mills and groceries for the stores were brought back. The whole voyage required three days.

Up to this time the increase in population as a result of the introduction of manufacturing had not been very great.

The population of Lancaster was:

1460 in 1790

1584 in 1800

1694 in 1810

1862 in 1820

2014 in 1830

2019 in 1840

In 1790 not more than 100 people were living within the present limits of Clinton. Forty years later, in 1830, there were thirty dwelling houses west of the Nashua River within those limits. Ten houses were owned by the cotton factories, twelve stood on farms of considerable size. In this part 200 people were living. One hundred lived east of the Nashua. This gives a total of 300 inhabitants.

In 1835, during a period of depression in the cotton industries the factories closed down. There were sold the next year. In the upper mill the manufacturing of coach lace was begun in 1838. In 1841, 40 hands found employ-

mopolitan population was the result.

COMPOSITION OF POPULATION OF CLINTON, 1855 to 1875

	Native	Irish	Brit.Am.	Great Brit.	Scand.	Germ.
1855	2226	994	60	75	207	65
1865	2648	962	47	88	172	97
1875	4080	1717	131	524	-	312

Within a short time economic and social conditions had changed completely. The inhabitants of Clintonville no longer had much in common with the farming population in the northern part of Lancaster. Differences of opinion about the appropriation of the town money arose, and it became very difficult to carry on the town affairs to the satisfaction of both sections. This finally led to the incorporation of Clintonville as an independent town under the name of Clinton in 1850.

The coach lace factory at the upper mill privilege did not prosper. In 1851, 100 were employed, but the manufacturing of gingham had to be introduced to keep the mill going. In 1862 a few years after the outbreak of the war, business was suspended. Meanwhile the genius who had invented the loom for coach lace, E. Bigelow, had constructed the first carpet loom. In 1852 the Bigelow Carpet Company was incorporated. The upper mill was enlarged and business was started here. One hundred and fifty hands were employed in 1855.

The industrial census of the year 1855 gives two cotton factories, one producing gingham (The Lancaster Mills), one producing quilts and counterpanes (The Lancaster Quilt Company). Both together employed 900 people. One woolen mill (The Bigelow Carpet Company) employed 333 hands. The manufacturing of combs gave work to only 66 people.

The following period was one of disturbance in industry. The serious crisis of 1857 and also the war years had an unfavorable effect on manufacturing. Population increased only very slowly from 1855 to 1865.

In 1864 however an era of prosperity set in. From 1863 to 1877 the number of looms in the Lancaster Mills increased from 550 to 1520. There were not hands enough to do the work. Those who were well acquainted with textile machinery earned high wages. A considerable increase in the number of people from Great Britain was the result. There was also a great demand for unskilled labor. The Irish, who had first done most of the construction work, were now entering the mills. Between 1865 and 1875 their number doubled. Also the number of Germans, and British-American increased rapidly.

By 1870 the majority of the streets now in existence had been laid out. However, many of the home lots were not yet occupied. Main Street was no longer the main

street as in 1830. High Street had taken its place, Most of the stores and offices were on its southern end, near which were also the common, the churches and the schools. This period of rapid growth continued until 1900. Since that time the population has remained nearly stationary and the town has not increased very much in urban area. No new industries of great importance were established and the existing industries seem to have reached their maximum size in 1900.

Although Worcester was the shire town of the County for a long time other towns exceeded it in wealth and in population. Until as late as 1810, Sutton and Brookfield had a larger number of inhabitants. Both towns, however, had a much greater area than Worcester. In 1790 the density of population in Worcester was already slightly higher than in the two other towns. After 1810, and still more after 1820, the population of Worcester showed a rapid increase. It has continued to do so up to the present time. The graphic representation of this growth shows a remarkably smooth curve, that only very gradually takes on a less steep trend in later years.

The soil of the town was well suited for farming, and a large percentage was in use for agricultural purposes. In 1790, 34.5 percent of the area of the town was used as such, in 1811 57.8 percent and in 1831 79.9 percent.

The natural endowments of the town for manufacturing were not great. The amount of water power available in Worcester was quite small. The town lies near the head waters of the Blackstone River. The uppermost part of this river flows through the southern part of the town, and it receives from the north only a few insignificant brooks as tributaries. The area of the watershed is very limited and as a result not only is the power that the ^{streams} can furnish small, but their flow is not very even throughout the year. On the other hand there were a large number of basin-like depressions and it was not difficult to create a series of reservoirs along the main river and some of the brooks. Later, the factories increased in size and the limited amount of available water power was going to become a serious handicap. At this time, however, Worcester's manufactures were sufficiently specialized and the transportation facilities had become good enough to make an extensive use of steam power possible.

In 1811 Worcester counted nine saw^{and}/grist mills, two fulling mills, and two carding mills. In 1831 there were some saw and grist mills in existence, but their business was declining rapidly. The same was true for the fulling mills. Fifteen carding machines were in operation at that time. There was one cotton mill with

950 spindles and 24 looms and there were three woolen factories with a total of 988 spindles and 33 looms. In addition there were two paper mills, a factory of small arms, and a number of smaller and larger machine shops in which much attention was given to the manufacturing of textile machinery. The manufacturing of wire for cards was started in the same year.

In 1837, 225 persons were employed in woolen manufacturing, 170 in the manufacturing of machinery, 122 in the boot and shoe industry and 81 in the cotton mills. The manufacturing of wire, of cutlery, paper, cabinet ware, ploughs, tin ware, iron, lead pipes and chaises occupied 200 people. This gives a total of about 800 people engaged in manufacturing.

So it was from the outset that the diversification of industries, to which the city owes its remarkably even growth, began. The list of industries in Worcester becomes ever longer in later census reports.

A factor that was very favorable to this diversification is the advantageous location of Worcester. It is located centrally in the best part of the County. It is situated on the important road from Boston westward to the Connecticut valley. It is reached easily from the surrounding towns by roads through the valleys and gaps

that open to the basin in which Worcester lies. Early in its history Worcester was the center of traffic. In 1825 stage lines ran to many of the surrounding towns. There was a daily through service from Boston via Worcester to New York. Four other lines connected it with Boston three times a week. There were lines to Oxford, Providence, Hardwick and Northampton, Brookfield, Springfield, Keene, East Chelmsford, Southbridge, Dudley, Athol, Richmond, N.H. and Ashburnham. In its quality of shire town Worcester attracted visitors from surrounding communities who came on legal or political business.

In this way physical environment and political circumstances cooperated to make Worcester the natural center of the largest part of the County of Worcester. In 1831 the town had 28 warehouses and stores for a little more than 4000 inhabitants. A considerable amount of trade with the surrounding communities must have been going on. The opening of the Blackstone Canal from Worcester to Providence in 1828 is an illustration of Worcester's early leading position in trade and industries.

At this time, however, Worcester was not more than a good sized village. It had 4173 inhabitants, according to the Federal Census for the year 1830. Most of the

houses were built along Main Street. There were two distinct centers, one near the common, ^hwhere church and town hall were, another toward Lincoln Square near the Court house and the machine shops on the old Mill Brook. Each center had a business block on Main Street, respectively between Front and Mechanic Streets, and Thomas^s and School Streets. The lower part of Mill Brook was canalized for the Blackstone Canal, of which the upper basin was in the eastern section of the town.

Soon afterwards the era of railroads began and within a short time Worcester became a center of their lines. The railroads found easy grades through the valleys and gaps leading to the Worcester basin. In 1835 the Boston and Worcester was built; in 1839 the extension to Springfield, the Western Railroad, was opened for service. In rapid succession followed until the year 1850 the Norwich and Worcester, the Providence and Worcester, the Worcester and Nashua, the Fitchburg and Worcester.

From now on the products of Worcester's factories could be shipped easily in all directions. The list of Worcester's industries grew rapidly and the number of inhabitants of the city increased steadily. According to the State Census of 1855 there were 4100 people employed in manufacturing. In 1865, 8598 persons were engaged in

industrial occupations. Figures 20 to 23 give a good illustration of the rapid development of the city. The map of the year 1830 shows distinctly the two centers that, however, soon disappeared. It has been drawn after a lithographed map of the center of the town. Figure 21 was drawn after the map of Worcester by H. F. Walling. The solid lines indicate the areas that were entirely built up. The broken lines indicate parts of the city where streets were laid out, but settlement was still only sparse. Figure 22 after the "Atlas of Worcester" by F. W. Beers, illustrates the great extension during the boom period that followed the depression caused by the Civil War. The part laid out in streets during these years, but that was only sparsely settled in 1870, was larger than the part of the city that was entirely built up. By 1890 this whole area was occupied by houses. Figure 23 after a map published in the "Telegram Gazette" of June 4, 1922, pictures the more recent extension of the city and shows clearly the peculiar way in which Worcester is growing. Long tentacles reach out to all sides along the main highways and many open spaces remain in between. This aspect of the extension of the city gives rise to many serious problems in the management of municipal affairs.

The rate of growth of Worcester has been declin-

CHAPTER VI

ing slowly but steadily ever since the period of greatest increase between 1840 and 1850. If no unforeseen things happen this tendency will continue in future years. The upper limit of the curve seems to lie somewhere near to 350,000 or 400,000

The largest part is living in agglomerations of different size and different economic and social texture.

It is a difficult task to make a classification of the population of the County according to their mode of settlement.

The Census figures are given for towns. The town in New England is a smaller or larger area of land, usually of predominantly rural aspect, within which may occur one or more nuclei of population. No official data are available on the size of these centers within the territory of the town.

Another difficulty is the classification of the settlements. The age-old contrast between rural and urban settlements is entirely clear for the dispersed dwellings of a country population and the closely concentrated homes of a modern city population. Between village and city, however, the distinction is less well marked. In the older countries, as in western Europe, the contrast between city and village was originally marked

CHAPTER VI

THE SETTLEMENTS IN WORCESTER COUNTY

KINDS OF SETTLEMENTS

A small part of the inhabitants of Worcester County lived in isolated dwellings, scattered over the country side. The largest part is living in agglomerations of different size and different economic and social texture.

It is a difficult task to make a classification of the population of the County according to their mode of settlement.

The Census figures are given for towns. The town in New England is a smaller or larger area of land, usually of predominantly rural aspect, within which may occur one or more nuclei of population. No official data are available on the size of those centers within the territory of the town.

Another difficulty is the classification of the settlements. The age-old contrast between rural and urban settlements is entirely clear for the dispersed dwellings of a country population against the closely concentrated homes of a modern city population. Between village and city, however, the distinction is less well marked. In the older countries, as in western Europe, the contrast between city and village was originally marked

by sharp differences in political, social and economic conditions. City and villages were two entirely dissimilar organisms, with their own class of population, their own political rights and duties, their own economic interests, their own aspects. Modern development has broken down the walls of the cities. Although in many of those older countries, always the public mind, and often the administration still continue to adhere to the old classification, with the walls of the cities the rigidity of the distinction between city and village has disappeared also here.

In a younger country like the United States, with a smaller number of traditions acting as brakes, no clearly formulated official difference exists any more between city and village.

The United States Census classifies as urban the towns in southern New England with more than 2500 inhabitants and as rural all the others. This system however, does not work for New England towns. The town of Barre for example, with 3357 inhabitants is classified as urban; but no urban settlements exist within the town. The same holds true for the towns of Auburn, Grafton, Hardwick, Holden, Lancaster, Leicester, North Brookfield, Oxford, Shrewsbury and others.

For statistical purposes it is necessary to have

a mathematically exact definition of the words urban and rural. The reports of the Federal Census in which a comparison of data for all parts of the country must be made cannot adopt a different criterium for a small section like southern New England.

From a geographical point of view the distinction on the basis of size is not satisfactory. An explanatory description has to go further into the problem and has to use less rigid criteria.

The percentage of the population engaged in agricultural or non-agricultural occupations, cannot serve either as a basis for the distinction between rural and urban settlements. In the current meaning of the words rural and urban a factor of aspect is included. There are many settlements with a typical rural aspect in which the majority of the population is engaged in industries. And there are, although not in Worcester County, settlements with a typical urban aspect, that depend entirely on agriculture (for example the so called "Landstaedte" in Germany). Besides, no statistics on occupations by settlements are available for southern New England.

The factor of aspect combined with that of the dominating occupation in loco of the population may result in a classification that comes closer to the truth. The

factor of size can be introduced then if necessary, for secondary purposes. A disadvantage of this type of classification is the fact that it leaves more to the personal judgment of the observer.

In a settlement of urban type, houses are built more closely together, and there is always a section where they are entirely built together. Here we find the shopping and business centers. Usually there are more than two streets with stores and offices. A large portion of the urban settlement may consist of residential areas, where houses are built much farther apart. The large majority of the population is engaged in industry and commerce.

The rural settlements may be divided into:

- a. scattered farmhouses and other dwelling places
- b. rural-agricultural villages
- c. rural-industrial villages
- d. rural-residential villages

In the first group may be reckoned, small clusters of houses, so called hamlets, near cross roads or in other places.

The rural-agricultural villages have a population that relies predominantly on agriculture as a livelihood. The village may have one or a few stores. The stores

may be built together in some of the larger villages to form a continuous row, but no distinct business center exists. There are some buildings that serve as social centers for the population of the village and for the surrounding farm population: one or more churches, one or more halls for fraternal organizations, social gatherings, or entertainments.

The third group, that of the rural-industrial villages, is made up largely of small villages clustered around one or two factories. Their population is predominantly industrial. The settlement is not large enough to have a distinct business center. The houses are built village-wise. Sometimes there is a street where stores are built together. Sometimes only one or two of those exist, not infrequently maintained by the mill owner for the convenience of his employees.

The last group, the rural-residential villages, are found only near larger urban centers. In these the majority of the inhabitants have their business in the city. Often all the interests of the inhabitants are centered there too. No churches or other public buildings are found in that case. Usually, however, with the coming of stores a small center develops, and churches, etc. follow in time. Often these rural-residential villages were formerly rural-agricultural villages and

a center existed beforehand.

As urban can be considered settlements like Worcester, Fitchburg, Gardner, Athol, Clinton and Leominster.

Examples of rural-agricultural villages are: Harvard, Lunenburg, Sturbridge, Paxton, Rutland, Shrewsbury, Petersham, Princeton, Phillipston, Oakham, Royalston, Etc.

Examples of rural-industrial villages are: Gilbertville, South Barre, North Brookfield, Cherry Valley, Jeffersonville, Baldwinville, East Douglas, Whitinsville.

As rural-residential can be considered Stoneville in Auburn.

As statistics are now, it is not possible to ascertain which part of the population is living in each of the different kinds of settlements.

LOCATION AND TYPES OF SETTLEMENTS

One of the most important problems with which the settlers, that were establishing a new town, were confronted, was to find a suitable location for the meeting house. The latter was going to be the center toward which the whole social life of the community would gravitate. It had to be within easy reach for all inhabitants and consequently it was usually located quite near to the

mathematical center of the town. Another important factor in the early days, when Indian tribes were still roaming around, was that of safety. Places of some strategic virtue, especially points from where a good view over the country always could be kept, were preferred. This explains, partly, but not satisfactorily, the early tendency of the villages to cling to the hill tops. Some of the towns that have been incorporated after the depredations by Indian raids were things of the past, show also villages located on the tops of the hills. During the first decades after the incorporation the population in many of the towns had their farms in the vicinity of the center on the so-called home lots, and thus the agricultural value of the land must have been a factor of importance too. All the early town centers are located on or near to areas of the best kinds of soil. Sometimes these areas are quite extensive, as in the case of Petersham, Winchendon Center, Hubbardston, North Brookfield. Sometimes they are on more restricted areas lying amidst soils of distinctly lower quality. This is true for Rutland, Phillipston, Barre, Hardwick, Dana, Dudley, Lunenburg, Princeton, Bolton, Holden, Shrewsbury, Grafton, Upton, Mendon, etc. Most likely the location of the center of the town was determined by both factors, safety and quality of the land; during the early

time the first was more important, during the later times the second.

Also the scattered farm houses are found mostly in higher elevations. Here, on the broad backs of the hills most of the good farmland was found. The sides of the hills usually had too many ledges of bare rock and were too stony for cultivation and the floors of the valleys were often swampy and narrow and too much exposed to the spring freshets.

Originally the valleys were inhabited only where a mill was located. When manufacturing entered the region and factories were built, the valleys attracted the main part of the population. In the beginning industrial settlements sprang up near each grist mill or fulling shop. Many of those settlements have disappeared, many have led for years only a languishing life, only a few have grown to become centers of population.

Small industrial centers have disappeared entirely for lack of sufficient power or for isolation. Examples of these are Wachusett village (in 1830: 4 mills and a cotton factory), Wire village (in 1830: 7 shops), East Phillipston (in 1830: 2 cotton factories and one woollen factory).

There are no differences in the plans of the

New England cities and villages that go back to social and economic conditions that have long since disappeared, as is the case in many European countries. (1) The New England village has a common green in the center, sometimes rectangular, more often triangular in shape. It is usually shaded by elm trees and surrounded by white painted buildings, one of which at least is always a church. This type is found everywhere with only slight variations. Many towns have become cities and the original plan and aspect of those towns has been lost in the subsequent development. The factory villages have usually grown without any definite system. They are affected entirely by local conditions.

The hills of Worcester County that provide for such a pleasing variation in the landscape, are also responsible for the differences in location and in aspect of the individual settlements.

Two main types stand out.

The oldest type, the hill town, is perched on top of the ridges and hills of the County. The majority

(1) See among others: Meitzen: Siedlung und Agrarwesen der Ostgermanen und Westgermanen, der Kelten, Römer, Finnen und Slawen, 1895, 3 vols.
R. Martiny, Die Grundrissgestaltung der deutschen Siedlungen, Petermanns Mitteilungen, Ergänzungsheft Nr. 197, Gotha, 1928

of the hill towns date back to the time that Indian hordes formed a persistent danger, and a settlement had to have some strategic value. As examples of hill towns may be cited Rutland Center, Oakham, New Braintree, Petersham, Charlton, Mendon, Phillipston, Templeton, Shrewsbury and Brookfield.

The second type is formed by the valley settlements. A few of these are old, the majority however, is of rather recent origin. They occur, with hardly any exception, near water privileges. All of them either are, or were, industrial settlements. As examples may be cited: Fitchburg, South Royalston, Baldwinsville, Gilbertville, Millbury, Blackston, Uxbridge and Northbridge.

As special types of valley settlements may be considered the towns built on river ^{or} lake terraces, and those on valley divides. To the first group belong, among others, Dana and Northboro, to the last Sterling and Holden.

A typical feature in New England are the towns of which the houses are arranged along a main road, as beads on a string. Examples of such string towns* are Shrewsbury, Northbridge Center, Paxton Center, Rutland

*For this name the author is indebted to Dr. E. C. Semple

Center, New Braintree, Hubbardston, Oxford, Dudley, Sutton and Charlton. The typical string town is found where one road is of predominating importance. In the case of the intersection of two or more roads of about equal importance, houses are usually found along all of them. A center is easily established, from which the town grows in all directions. The building of new roads, or changes in importance of existing roads may affect the string town and change it into a town with a more radial arrangement of the houses.

TYPICAL DEVELOPMENT OF SOME SETTLEMENTS

As has been described in previous chapters, a gradual displacement of population took place during a century and a half that is covered by this study. Many of the hill top farms were abandoned and the population descended to and were concentrated in the valleys, where the factories offered a chance for a better living.

This economic change is reflected in the development of the settlements in Worcester County. The hill top towns have languished. All of them have declined in relative importance, and some even in absolute importance. On the other hand a number of settlements, that originally did not include much more than a shop, a mill or a small factory and a couple of houses, have gained

rapidly in population, and are now important centers. In many instances they have become larger and wealthier than the original town centers, Often the chief municipal institutions have been transferred to them. Other settlements of the same original size, and on which great hopes were built that once they would be centers of industry and enterprise, have never proceeded beyond the size of mill and a score of factory houses. In some cases the ruins of an old factory building are the only vestiges left of an early optimistic start. (East Phillipston)

Some of the most typical examples of development may be sketched here briefly. In the town of Winchendon the old center has become stagnant, and the original site of the town grist mill became the modern center. The old center is located on the upland, on one of the numerous hills known as Mount Pleasant. In 1790 the main roads of the town all converged here. There was a church, a school, an inn. Where now Winchendon is, only a grist and saw mill stood. A road led down from the village to the mills. The quite important road from Keene to Boston passed close to the mills, but did not touch the center village. In 1830 a woolen factory had been built on the water privilege. The old grist and saw mills were still existing. By this time the mill village seems to have increased in impor-

tance. The map of Winchendon of 1830 does not show any houses. From the fact however that the mill village counted three stores and an inn, we may infer that a sufficient number of customers were living in close proximity. The mill village continued to grow. In 1857 it was called North Winchendon Village. It had a cotton mill, a tannery, a couple of machine shops, a pail factory, and some other shops of minor importance. The former Cheshire Railroad, now the Fitchburg Railroad gives it good transportation facilities. The existence of a town house, academy and three churches indicates that it had become the main settlement in the town of Winchendon. The total number of houses at this time is a little above 150. In 1870 the village was called Winchendon Post Office. Several streets had been added, the number of houses has increased. In 1790 the name is changed to Winchendon. At present it is many times larger than the old center. It has wood industries, good railroads connections, and all the important roads of the town converge here. The old center is not more than a small agglomeration of a few houses.

Another example of a similar development is Millbury. The "Old Common", where still a number of country roads converge, is the old center of the town, that was superseded by the present industrial town of Millbury.

In many instances the old town center has kept its name, but it is no longer the real center of the community. One of the industrial settlements that has developed subsequently has taken its place. Gilbertville has become the most important settlement in Hardwick, North Dana in Dana, Baldwinsville in Templeton, Fiskdale in Sturbridge, Charlton City in Charlton, East Douglas in Douglas, Whitinsville in Northbridge.

In the towns of Ashburnham this development occurred still earlier. A hill, still called Meeting House Hill, although no remains of a building are left, was the place the early settlers chose for the center of the community. In 1790 the church was on top of this steep eminence. The main road to Winchendon ascended the hill and passed the meeting house. It could not be ascertained if any dwelling houses existed on the hill at this date. In 1830 there was only the meeting house and a store. The latter indicates that the hill still retained some importance as a local center. However, another center had developed at the foot of Meeting House Hill and outgrown the old center on top of it. Where in 1790 only a fulling mill and a pot and pearl ash establishment were located on Phillips Brook, we find in 1830 a bark mill, a pail factory, a trip hammer shop, a carding mill, a fulling mill and a lathe. The main road

did not pass over Meeting House Hill any longer, but followed an easier course westward. Along this road and near the shops a score of houses, two stores and a school existed. In 1832 and 1833 new meeting houses were built on the part of the Winchendon road that had become the Main street of the village of Ashburnham.

In Ashburnham the original and the later center were quite close together. This leads us to the cases in which only the center of gravity of the settlement shifted.

In Spencer the original center was on the slope of a hill in the eastern part of the present settlement. Here was the first church, when Spencer was still, as Brissot de Warville calls it, "A village in the Woods". Later mills and factories developed at the foot of the hill, where two brooks joined, that flow around the hill at the north and south side. Also the station of the railroad branch to Spencer was built in this lower place. As a result the center of gravity of the town moved downward to the foot of the hill. Here are at present most of the stores, offices and factories.

Athol affords another example of the shifting of the town center. The old center was on the hill southeast of Millers River, and forms now the extreme eastern portion of the urban area. The section of

the town in the valley of the Millers River and west of the Boston and Maine Railroad, where all important public buildings are located, is the present center.

Other examples of shifting of the original center are North Brookfield and Northborough. In North Brookfield the center moved northward to the next cross roads when a new church was built in about 1820. In Northborough the center moved eastward to the other side of Gold Harbor Brook, and clustered finally around the station.

Some towns have developed from two distinct centers. Southbridge has grown up out of two small rural-industrial settlements: Globe village and Southbridge Center. Worcester has developed out of a center near Lincoln Square and one near the common.

Changes in the development of the different settlements in Worcester County are still going on and are bound to continue as long as a settlement keeps on growing.

CHAPTER VII

CONCLUSION

The early settlement of Worcester County proceeded according to the lines dictated by the physical environment. The lower eastern part and the basins were settled first, the high northwestern part of the upland last. The early population was agricultural, with extreme local self-sufficiency. It was distributed very evenly over the whole region. Centers of population were small.

An approximate reconstruction of the town boundaries of about 1765 can be made on the basis of old maps and other data. According to this reconstruction and the data of the Census of 1765, the density of population at this time was still low. It varied between 2.6 inhabitants per square Kilometer and 15.0 per square Kilometer (6.5 per square mile and 37.5 per square mile). The density was highest in the eastern, early settled section of the County, lowest in the northwestern, latest settled section. A strip of higher density stretched across the County along the "old country road". By 1790 population had become more dense over the whole region. Again density was highest in the eastern part of the County, lowest on the upland, Immigration was insignificant before 1830.

Emigration to New York and the Middle West curtailed the increase of population after 1790. The effect of emigration on the trend of population is most noticeable between 1790 and 1830. Especially after the last date the increase in immigration makes the interpretation of the population curve more difficult. The probable number of emigrants from Worcester County between 1790 and 1820 was 40,000. The area of land used for agricultural purposes increased considerably between 1790 and 1830. The opening of the Middle-West was a happy coincidence that relieved this region of the surplus human product of the hill farms.

The great change in the development of the County of Worcester occurred about 1830. Within thirty years from agricultural it became industrial and from rural urban, within fifty years from Puritan it became foreign.

Agricultural competition from the West grew more and more serious. The area of land used for tillage decreased after 1830. The increase in the total amount of land used for agricultural purposes up to 1885 was due to an extensive increase of the pasture area. The abandonment of farms and farm lands became more acute. Later specialized farming led in some places to a revival. This may put a stop to a further decrease in country

population.

Physical features were very favorable to the development of water power, Originally the number of lakes and ponds in Worcester County was small, but it increased rapidly. In early times mills were scattered all over the region. Manufacturing on the basis of the factory system penetrated Worcester County. Later, a concentration in industries began that still continues at present.

As a response to the changes in the economic basis of life, a differentiation in the development of the towns set in. The industrial towns took on an upward, the agricultural towns a downward, trend in population. The distribution of the population became ever more uneven. Density of population decreased on the agricultural uplands, starting on the marginal soils; it increased in the urban settlements in the valleys. As a result of the development of industries foreign labor entered the region; first Irish, French-Canadians and English, later Germans, Scandinavians and people of southern and eastern European origin. Certainly by 1880, and probably even earlier, most of the towns had a population of largely foreign stock. Since that time the composition of the population has not changed markedly.

The settlements of Worcester County may be divided into rural and urban settlements. The latter are all urban-industrial; the former may be divided into: rural-agricultural, rural-industrial and rural-residential settlements. According to the location two main types stand out, the hill settlements and the valley settlements. Sub-types within the last group are the terrace settlements and the settlements on valley divides. A conspicuous sub-type within both groups is formed by the "string towns".

Bibliography

- Alden, W.C. The physical features of Central Massachusetts.
U.S. Geological Survey. Bulletin 760-B.
Washington. D.C. 1924.
- American Husbandry
containing an account of the soil, climate,
production and agriculture of the British
Colonies in N. America and the West-Indies.
by an American. 2 Vol. 1775. London for
J. Bew.
- Annual Report of the Commissioner-
General of Immigration.
U.S. Department of Labor
Bureau of Immigration.
- The Apple Situation in New England.
Published by the Connecticut and Maine
Agricultural Experiment Stations and the
Extension Services of New Hampshire,
Rhode Island and Massachusetts. 1927?
- Annual Report of Mass.
Bureau of Statistics of Labor. 1890,
pp. 177-258
Statistics concerning abandoned farms in
Mass.
- Atlas of American Agriculture.
Part IX. Rural Population and organizations.

Section I. Rural Population by F.A.
Goldenweiser. Washington, D.C. 1919.

Ballou, A. History of the town of Milford, Mass.
Boston 1882.

Barber, J.W.

Historical Collections.
Worcester, Mass. 1839.

Barrell, J.

The Piedmont Terraces of the northern
Appalachians.
American Journal of Science. 4th Series.
vol, 49. 1920.

Beers, F.W.

Atlas of Worcester County, Mass. 1870.
Atlas of Worcester City. 1870.

Benton, J.B.

Early Census making in Mass., 1905.

Bidwell, P.W.

Rural Economy in New England.
Transactions of the Connecticut Academy
of Arts and Sciences, Vol. 20. New
Haven 1915.

Bidwell, P.W. & Falconer.

History of agriculture in the Northern
U.S. Carnegie Inst. of Washington. D.C.
1925.

Bigelow, E.B.

Remarks on the depressed condition of mfg.
in Mass. Boston 1858.

Bishop, J.L.

A history of American manufacturers.
1608-1860-, 3 vols. Philadelphia, 1868.

Blake.

History of Princeton. 1759-1915.

2 Vols. Princeton 1915.

Blodgett, S.

Economica, a statistical manual of the
U.S. Washington. 1806.

Brewer, D.C.

The Conquest of New England by the
Immigrant. 1926.

Brissot de Warville, J.P.

New Travels in the U.S. of America in
1788. London 1792.

Buell, Judge.

American Husbandry. 1840, 2 Vols.

Bullock, A.H.

Royalston Memorial. Winchendon. 1865.

Byner, I.

- Crises of 1837, 1847 and 1857.
University of Nebraska. Public. 1909.
- Camp, C. etc.
The New England Economic Situation.
Harvard undergraduate economic studies.
New York 1927.
- Carter, J.G. & Brooks, W.H.
A geography of Worcester County.
Lancaster 1831.
- Caswell, L.B.
History of the town of Royalston, Mass.
Royalston. 1917.
- Century of population growth.
Bureau of the Census. Washington, D.C.
1909.
- Clark, V.
History of manufact. in U.S. 1607-1860.
Carnegie Inst. 1916.
- Colman, H.C.
Report on the Agriculture of Middlesex
County. Boston 1841.
- Coxe, Tench.
Report on Manufactures. American State
Papers. Finance II.

Crosby, W.O.

Geological History of the Nashua Valley
during the Tertiary and Quaternary periods.
Tech. Quart. vol. 12. 1899.

Census of Massachusetts of 1764-65

Printed in Columbian Centinel of Aug.
17, 1822. from manuscript.

Chickering.

Statistics of the population of Mass.
1765-1840. Boston 1896. 160 pag.

Crane, E.B.

Early Paper mills in Mass. Worc. Soc. of
Antiq. Collections. Vol 7.

Daniels, G.F.

History of Oxford Mass. Oxford, Mass.
1822.

Dickinson, R.

A geographical and statistical view of
Mass. proper. 1813. Greenfield, Denio &
Phelps.

Directory of Massachusetts Manufacturers 1927.

Published by Sampson & Murdock Co.
Boston, Mass. 1927.

Directories of New England Manufacturers

From 1870 on.

- Draper, J. History of Spencer, Mass. to the year 1860.
Worcester, Mass.
- Dwight, T. Travels in New England and New York.
New Haven 1821.
- Emerson, B.K. Geology of Massachusetts and Rhode Island.
U.S. Geological Survey. Bulletin 597.
Washington. D.C. 1917.
- Estes, D.F. History of Holden, Mass. 1684-1894.
Worcester, Mass. 1894.
- Farming in New England.
Report of the Commissioner of Agriculture
for the year 1870.
Washington. D.C. 1871.
- Reports of the Federal Census for the years:
1790.1800.1810.1820.1830.1840.1850.1860.
1870.1880.1890.1900.1910.1920.
- Felt, J.B. Population of Massachusetts.
Coll. of the Am. Statistical Association.
Vol. 1. 1845. Boston 1845.

Files of the New England Farmer.

Flagg C.A.

A guide to Massachusetts local history.
Salem Mass. 1907.

Ford, Andrew A.

History of the origin of the town of Clinton.
1653-1865. Clinton 1896.

French. G.

New England. Boston Chamber of Commerce.
1911.

Gatineau, F.

Histoire des Franco-Américains de South-
bridge, Mass. 1919. Framingham, Mass.

Gilbert, A.W.

The Food supply of New England.
New York 1924.

Green, S.A.

The first Census of Mass. Proc. of the
Mass. Hist. Soc. 1891. Vol. 6, 2nd Series.
American Statist. Soc. Vol. 2, No. 13.

Hall, H.B.

Agriculture in New England. MS. thesis
of Harvard University.

Hazard, B.E.

The organization of the boot and shoe industry in Massachusetts before 1875. Quarterly Journal of Economics. 27, 1912-1913.

Heads of families acc. to the first census of the U.S. in 1790. State of Mass. Washington 1908. 303 pag. Bureau of the Census.

Hill, H.W.

Waterways and Canal construction in New York State. Buffalo Hist. Soc Publ. Vol. XII.

Historical Data relating to Counties, cities and towns in Massachusetts. Commonwealth of Mass. Secretary of the Commonwealth. Division of Public Records. Boston, 1920.

Hurd, D.H.

History of Worcester County. 2 vols. Philadelphia 1889.

Immigration into the U.S. from 1820 until 1903.

Monthly summary of Commerce and Finance prep. in the Bur. of Statistics Treasury Dep. 1903.

Karlson, K.J.

The Swedish population of Worcester.

M.A. Thesis Clark University. 1910.

Keir, R.

Some responses to environment in Mass.
Geographical Soc. of Philadelphia Bull.
Vol. 15, p. 121-138, and 167-185. 1917.

Latimer, W.J., Martin R.F.R., Lanphaer, M.O.

Soil Survey of Worcester County,
Massachusetts. U.S. Department of
Agriculture. Bureau of Soils.
Washington. D.C. 1927.

Lincoln, W.

History of Worcester, Mass.
Worcester, Mass. 1837.

Manuscript maps of the distribution of temperatures
in New England made under direction of
Dr. C.F. Brooks, Clark University.
1927-1928.

Marvin, A.P.

History of Lancaster, Mass. 1643-1879.
Lancaster, Mass. 1879.

Marvin, A.P.

* History of Winchendon. Winchendon 1868.

Massachusetts Board of Agriculture.
Agriculture in Mass., synoptical and
analytical index. 1837-1892. prepared

by H. Fowler. Boston, 1893, 301 pag.

Mass. Bureau of Immigration in Mass.

Immigrant Races in Mass. Boston 1914.

Massachusetts Bureau of Statistics of Labor.

Census Reports for the years 1855, 1865,

1875, 1885, 1895, 1905, 1915, 1925.

Massachusetts Bureau of Statistics of Labor.

The Census system of Massachusetts for

1875, by O.E. Weaver. Boston, 1876.

Mass. Commission on immigration.

Report on the problems of immigration

in Mass. Boston 1914, 295 pag. House

No. 2300.

Massachusetts State Forester.

The Forests of Worcester County by H.C.

Cook under dir. of F.W. Rane. Boston 1917.

Mass. Statistical Tables.

Exhibiting the condition and production of
certain branches of industry in Mass. for

the year ending April 1, 1837. Prepared

from the returns of the assessors by John

P. Bigelow, Secr. of the Commonwealth of

Mass. Boston, Dutton & Wentworth, 1838,

209 pag. Same for 1845, 1855, 1865.

Mathews, L.K.

The Erie Canal and the settlement of the
West. Buff. Hist. Soc. XII.

Meyer, B.H.

History of Transportation in the U.S.
before 1860. 1917.

North, S.N.D.

The New England Wool Manufacture.
Bulletin National Association of Wool
Manufacturers. 1899, 1900, 1901, 1902.

Nourse, H.S.

History of Harvard. 1732-1893.
Harvard, Mass. 1894.

Nutt, C.

History of Worcester and its people.
New York, 1919.

Paige, L. R.

Address at the Centennial Celebration in
Hardwick, Mass. Cambridge 1838.

Pierce, F.C.

History of Grafton, Worcester, Mass. 1879.

Printed maps and manuscript maps of Massachusetts,
Worcester County, and the towns in
Worcester County.

Reed, J.

History of the town of Rutland.

Reports of the Immigration Commission. 1907

61st Congress 2nd, session, Document 633.

Washington, D.C. 1911.

Report of the Commission of the State of Massachusetts
on the route of canals from Boston

Harbour to the Connecticut and Hudson Rivers.

Boston 1826.

Agricultural schedules of the Federal Census for the
years 1850, 1860.

Semicentennical celebration of the incorporation of the
town of Clinton. 1850-1900.

Seyberts Statistical Annals of the U.S.

Philadelphia 1818.

Spofford, J.

A gazetteer of Mass. 1828. Newburyport,

C. Whipple, 1828.

Stearns, E.S.

History of Ashburnham. 1734-1886.

Ashburnham 1887.

Stowe, J.M.

History of the Town of Hubbardston.

Hubbardston, Mass. 1881.

Tax Returns for the towns of Worcester County for
various years. MSS.

Truesdell, L.E.

Farm population of the U.S.

Census Monographs VI. Bureau of the
Census. Washington. D.C. 1926.

Tudor, W.

Letters on the Eastern States. New
York 1820.

Turner, F.J.

Greater New England in the middle of the
19 century. AM. ANT. SOC.

Proceedings, New Series Vol 29, 1919.

Wall, Caleb A.

Reminiscences of Worcester. Worcester,
Mass. 1877.

Ward, A.H.

History of Shrewsbury, Mass. Boston 1847.

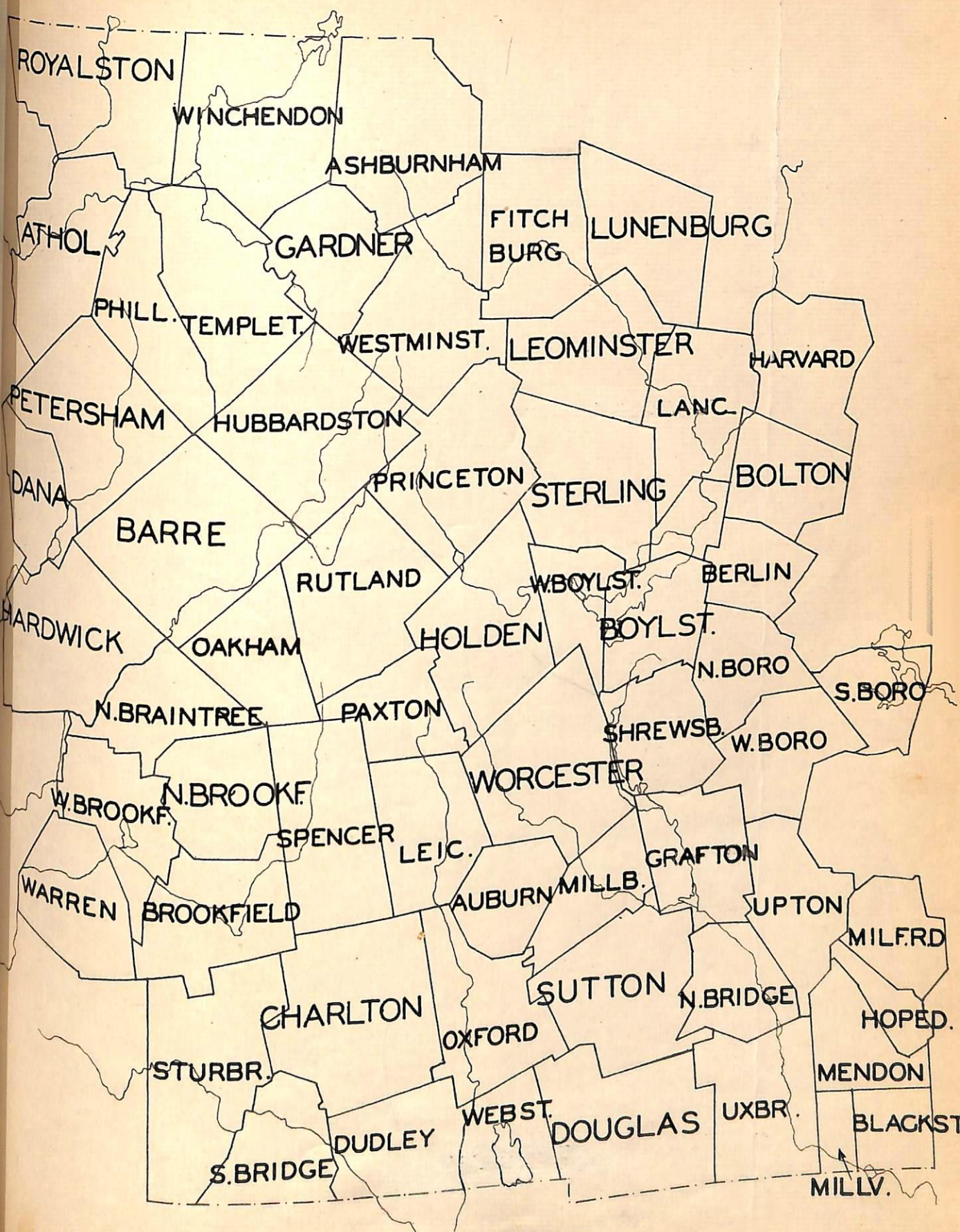
Washburn, E.

Historical Sketches of the Town of
Leicester, Mass. Boston, 1860

Weber, (H.J.)

The rainfall of New England. Masters
thesis Clark University 1927.

- Weeden, W.B.
Economic and Social History of New England
1620-1789. 2 Vols. Boston, 1890.
- Whitney, P.
The history of the County of Worcester.
Worcester, Mass. 1793.
- Willard, J.
History of Lancaster, Mass. Worcester
Magazine 1826. Vol 2., p. 257-344.
Worcester, Mass. 1826.
- Wood. F.J.
The turnpikes of New England. Boston. 1919.
- Wood, Isaiah.
The Mass. Compendium, Stating the boundaries
of Mass., etc. Boston 1814. 72 pag.
- Willcox, W.F.
A redefinition of city in: E.W. Burgess.
The urban Community. 1926.



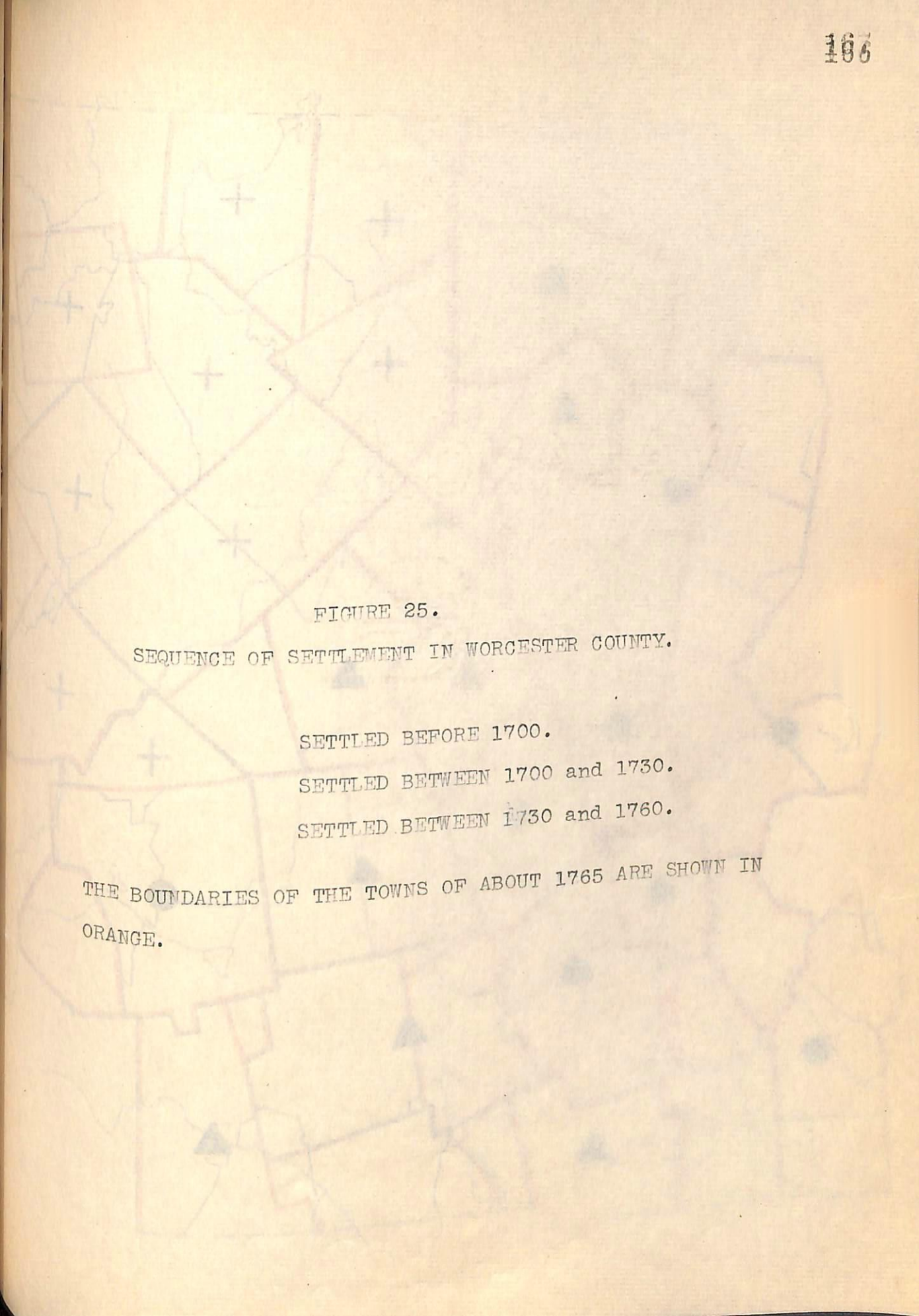


FIGURE 25.

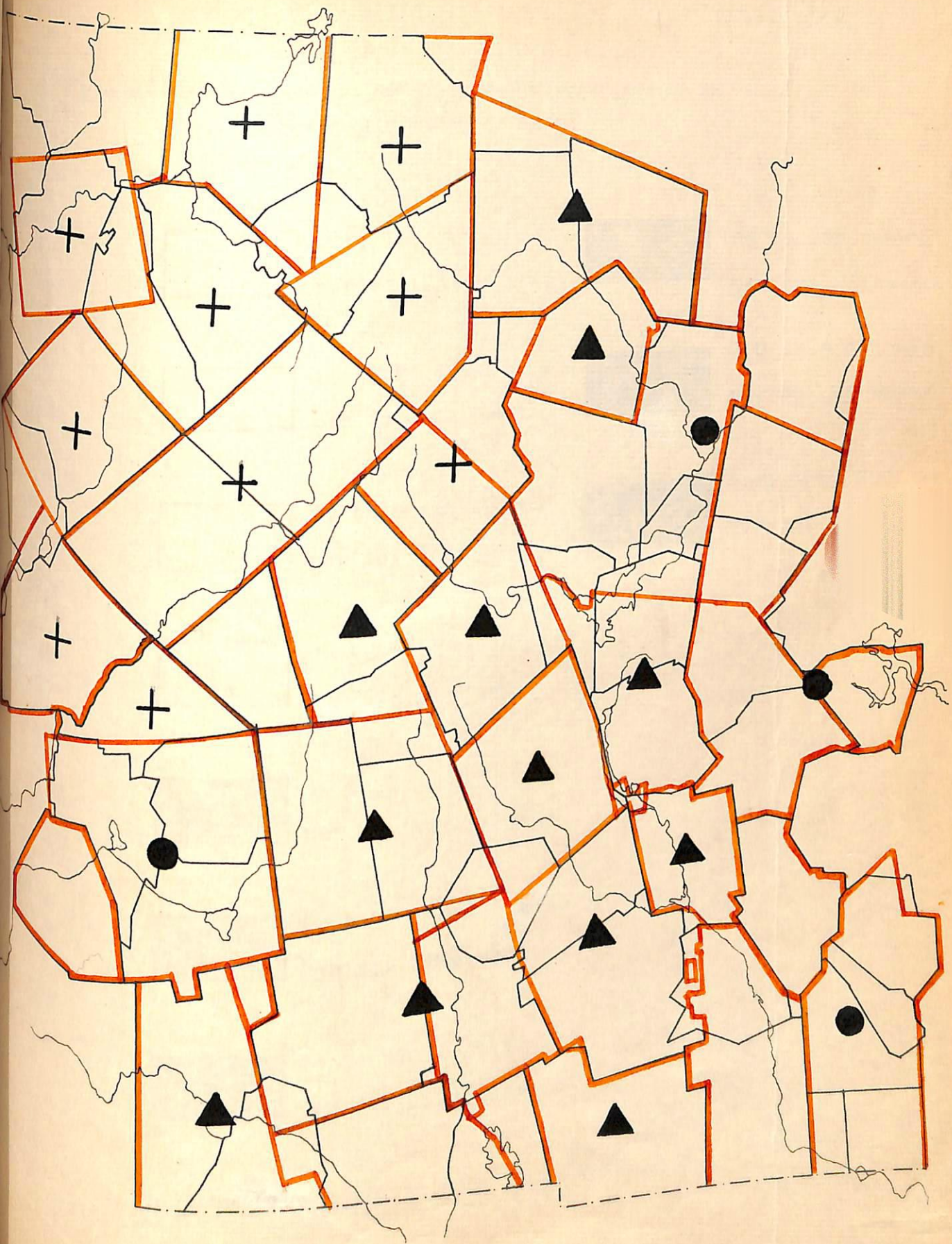
SEQUENCE OF SETTLEMENT IN WORCESTER COUNTY.

SETTLED BEFORE 1700.

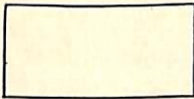

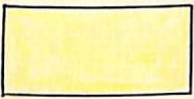







SETTLED BETWEEN 1700 and 1730.

SETTLED BETWEEN 1730 and 1760.

THE BOUNDARIES OF THE TOWNS OF ABOUT 1765 ARE SHOWN IN
ORANGE.



KEY TO THE CARTOGRAMS OF DENSITY OF POPULATION IN
WORCESTER COUNTY , MASS.

	0 to 10 inhabitants per sq. Kilometer.		100 to 200 inhab. per sq. Kilometer.
	10 to 20 inhabitants per sq. Kilometer.		200 to 500 inhab. per sq. Kilometer.
	20 to 30 inhabitants per sq. Kilometer.		More than 500 inh. per sq. Kilometer.
	30 to 40 inhabitants per sq. Kilometer.		
	40 to 50 inhabitants per sq. Kilometer.		
	50 to 70 inhabitants per sq. Kilometer.		
	70 to 100 inhabitants per sq. Kilometer.		

NOTE. The density per square mile can be found by
multiplying the above figures by $2\frac{1}{2}$.

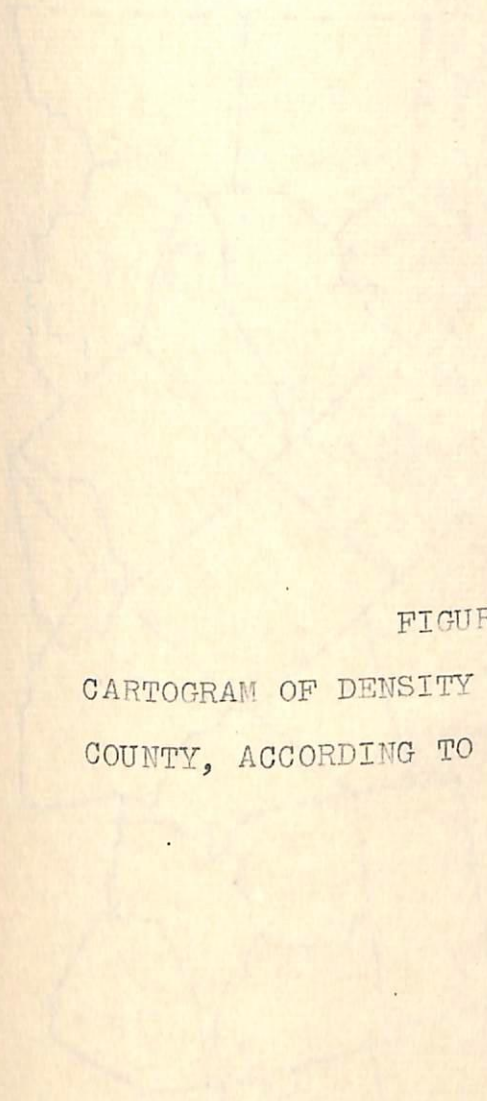
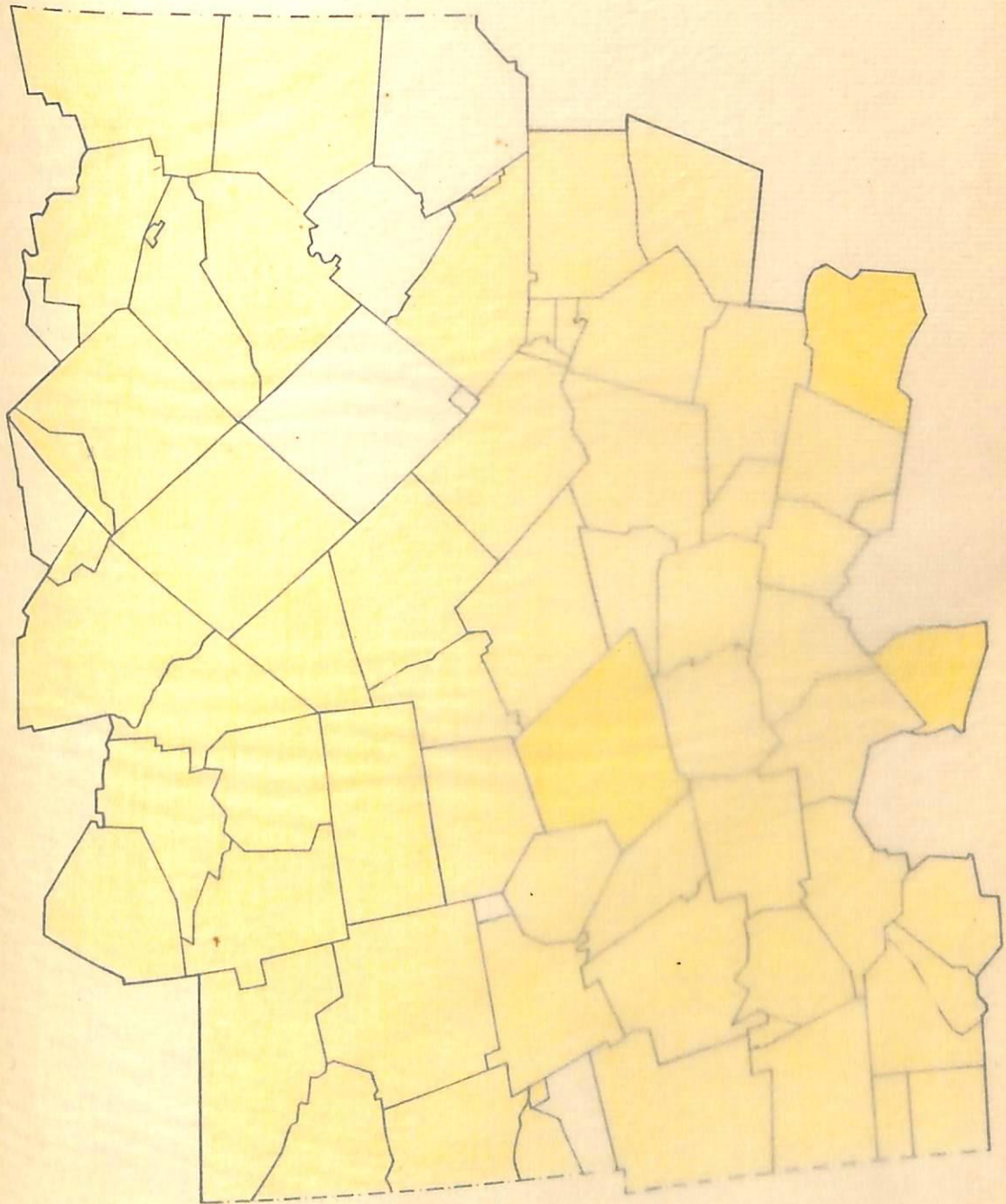


FIGURE 26.
CARTOGRAM OF DENSITY OF POPULATION IN WORCESTER
COUNTY, ACCORDING TO THE FEDERAL CENSUS OF 1790.



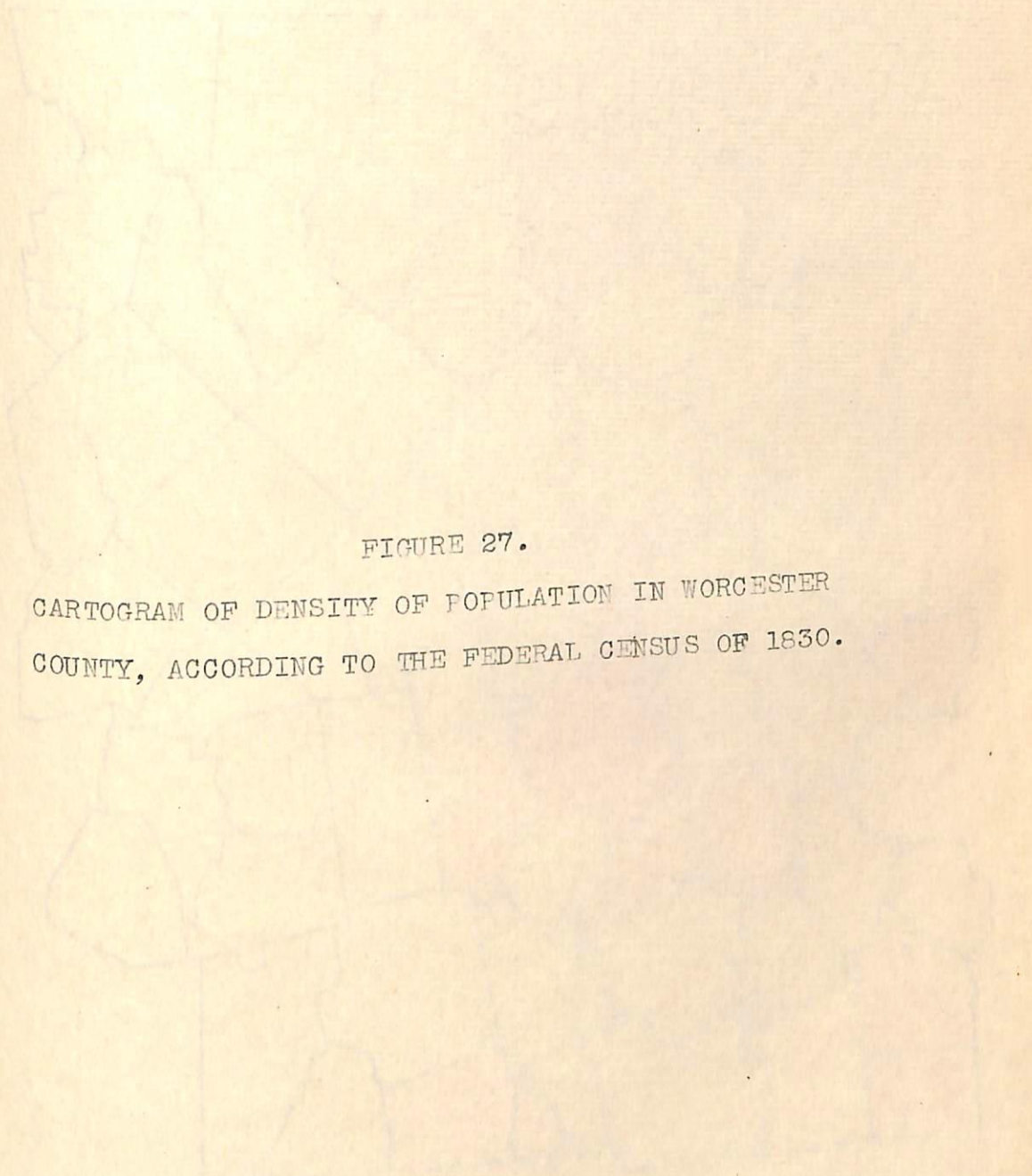
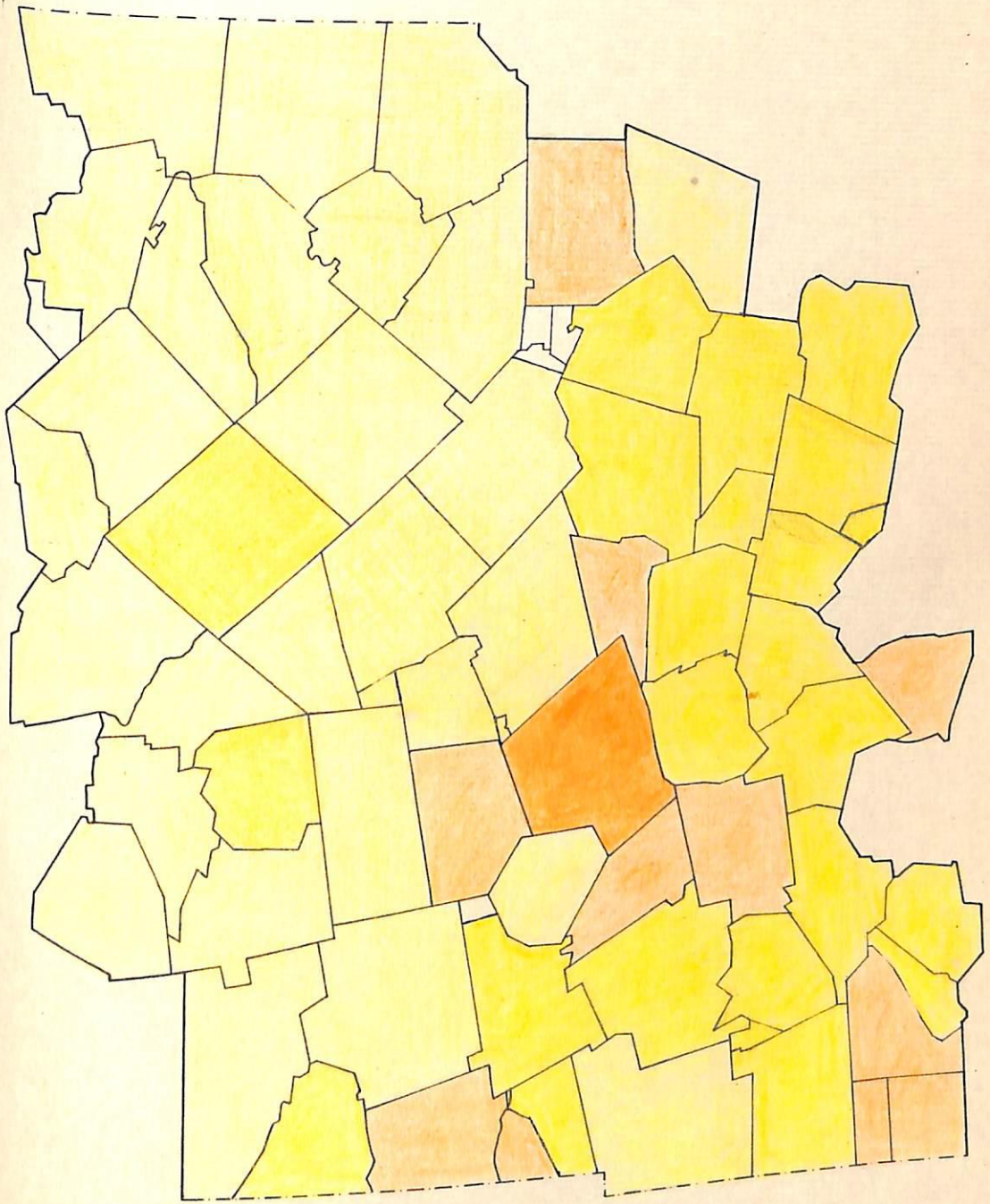


FIGURE 27.

CARTOGRAM OF DENSITY OF POPULATION IN WORCESTER
COUNTY, ACCORDING TO THE FEDERAL CENSUS OF 1830.



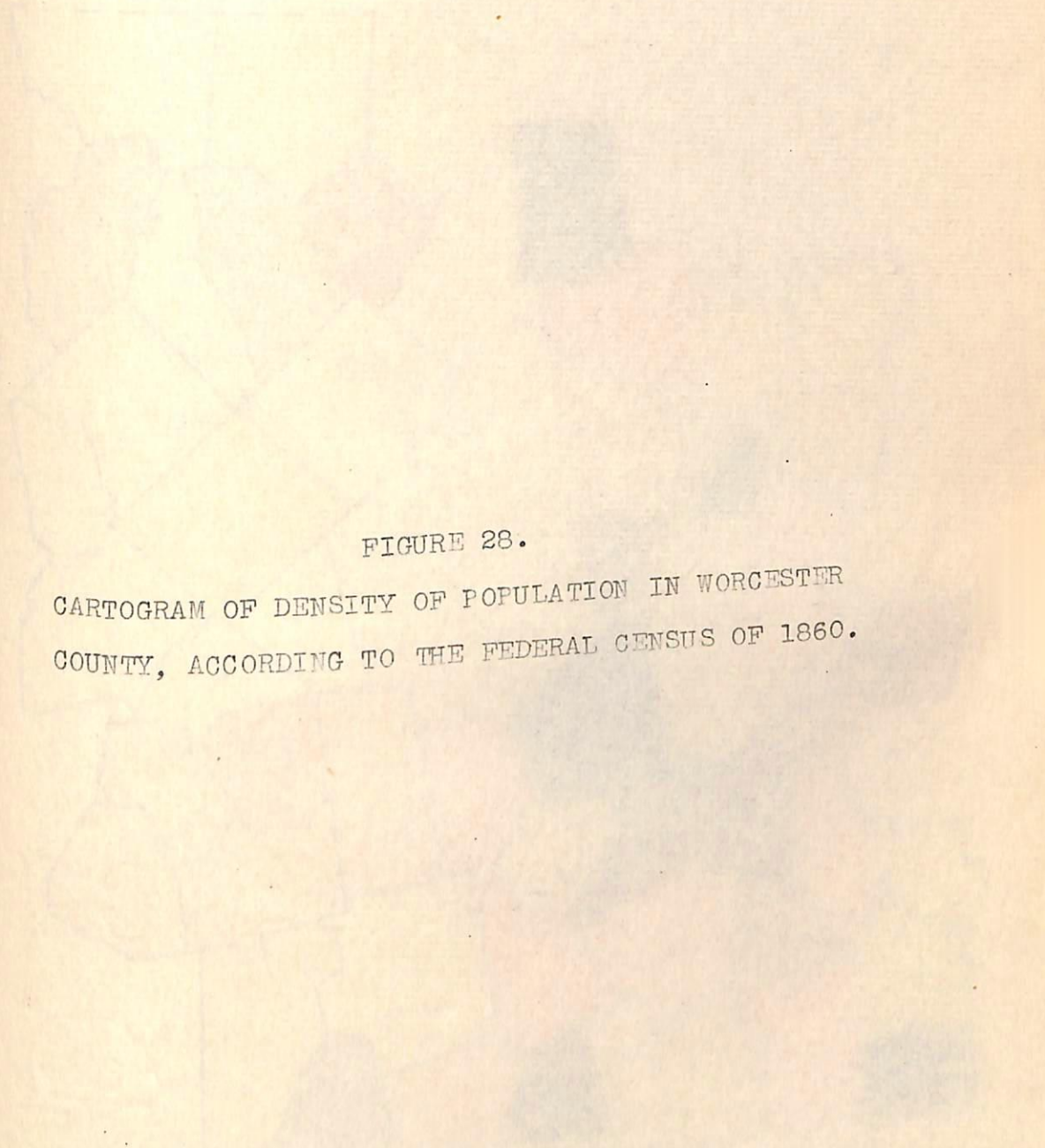
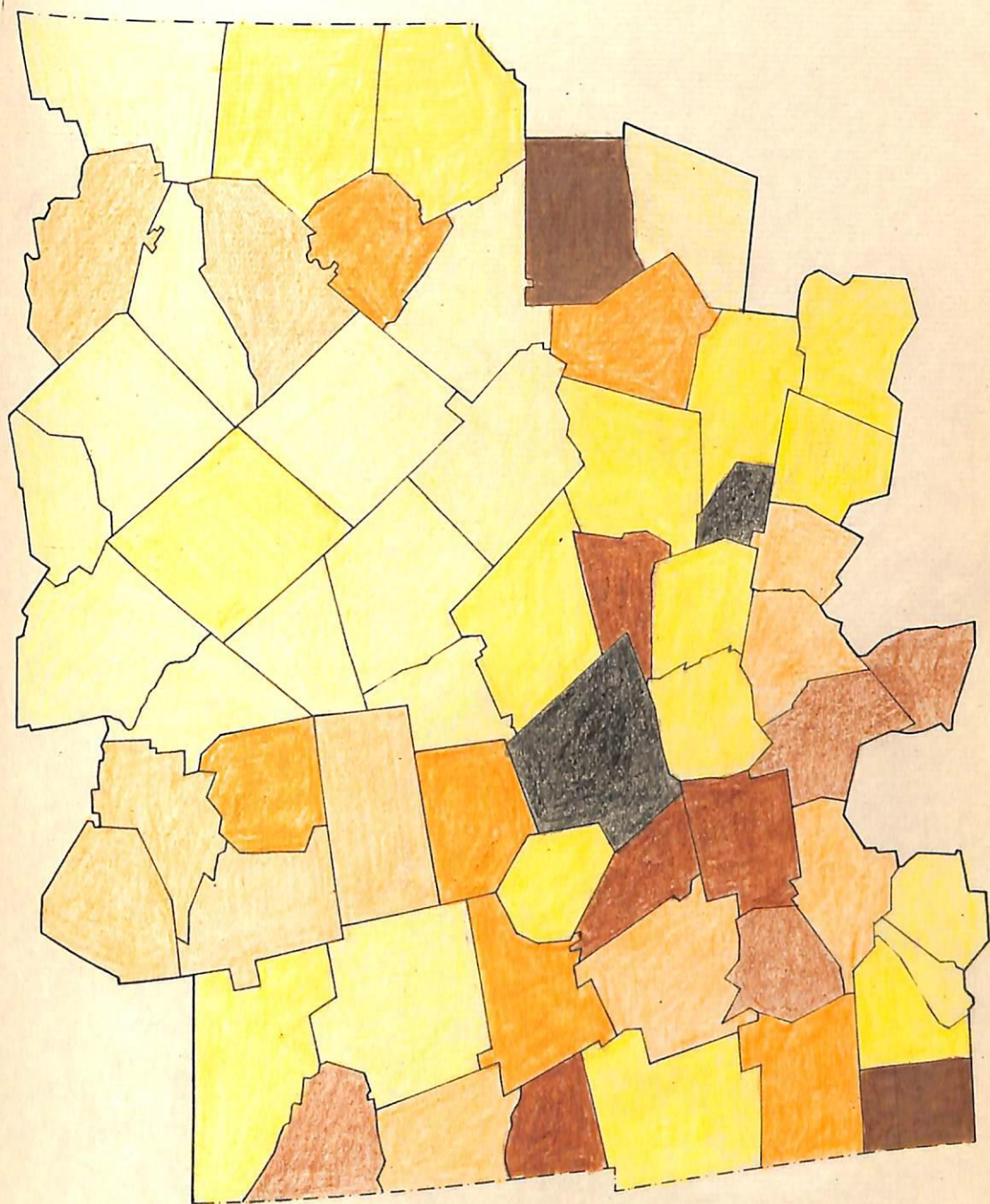


FIGURE 28.

CARTOGRAM OF DENSITY OF POPULATION IN WORCESTER
COUNTY, ACCORDING TO THE FEDERAL CENSUS OF 1860.



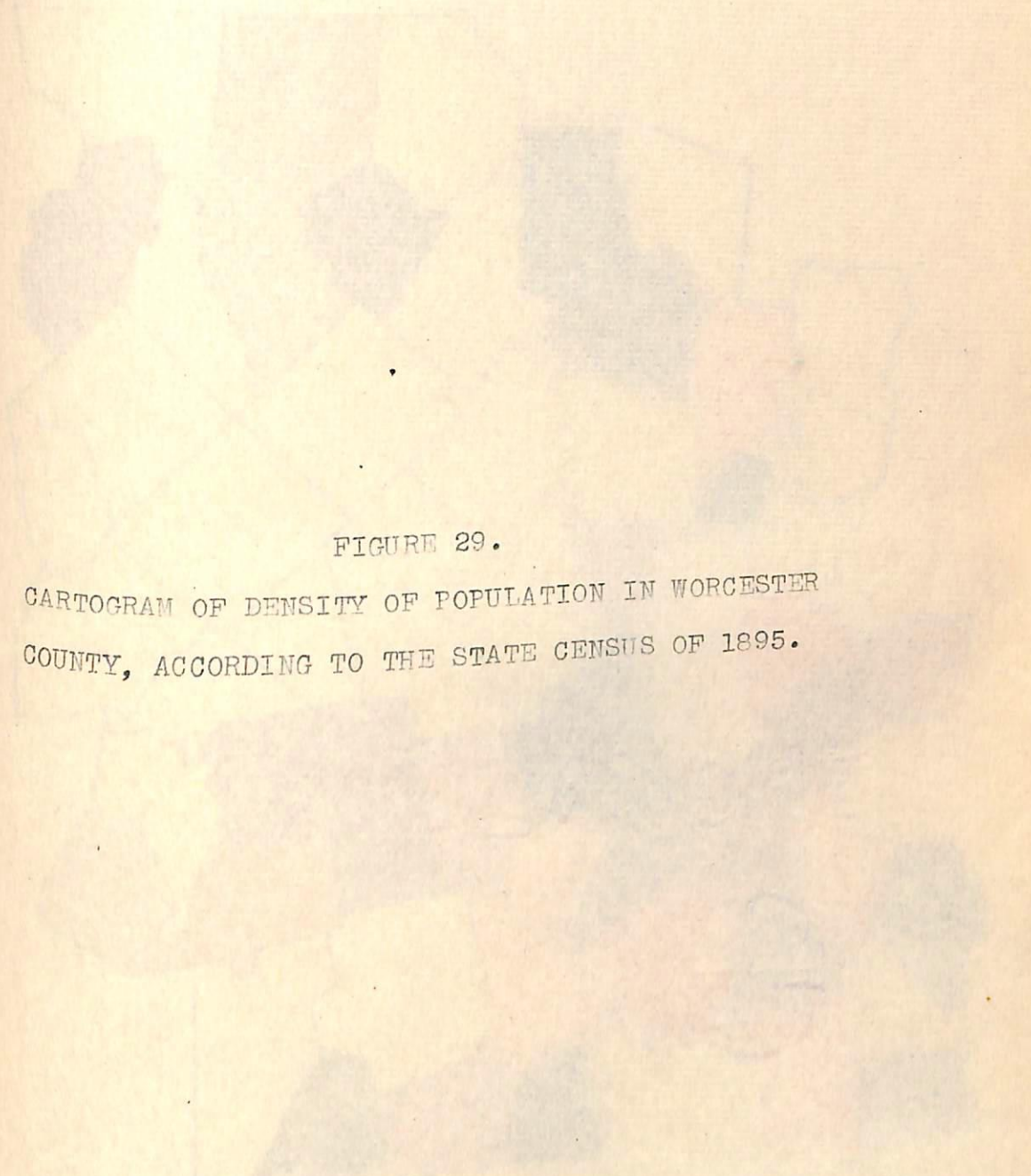
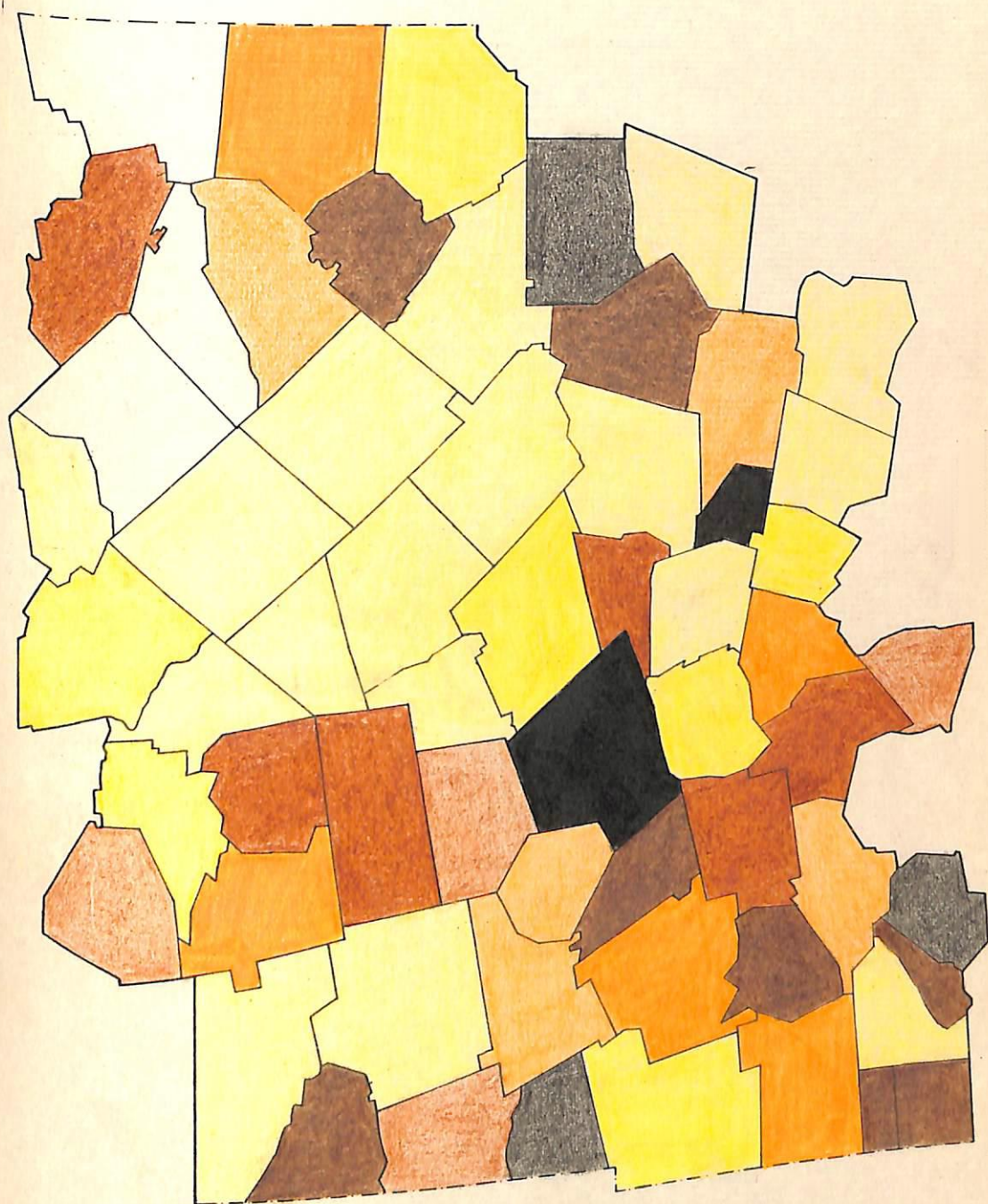


FIGURE 29.

CARTOGRAM OF DENSITY OF POPULATION IN WORCESTER
COUNTY, ACCORDING TO THE STATE CENSUS OF 1895.



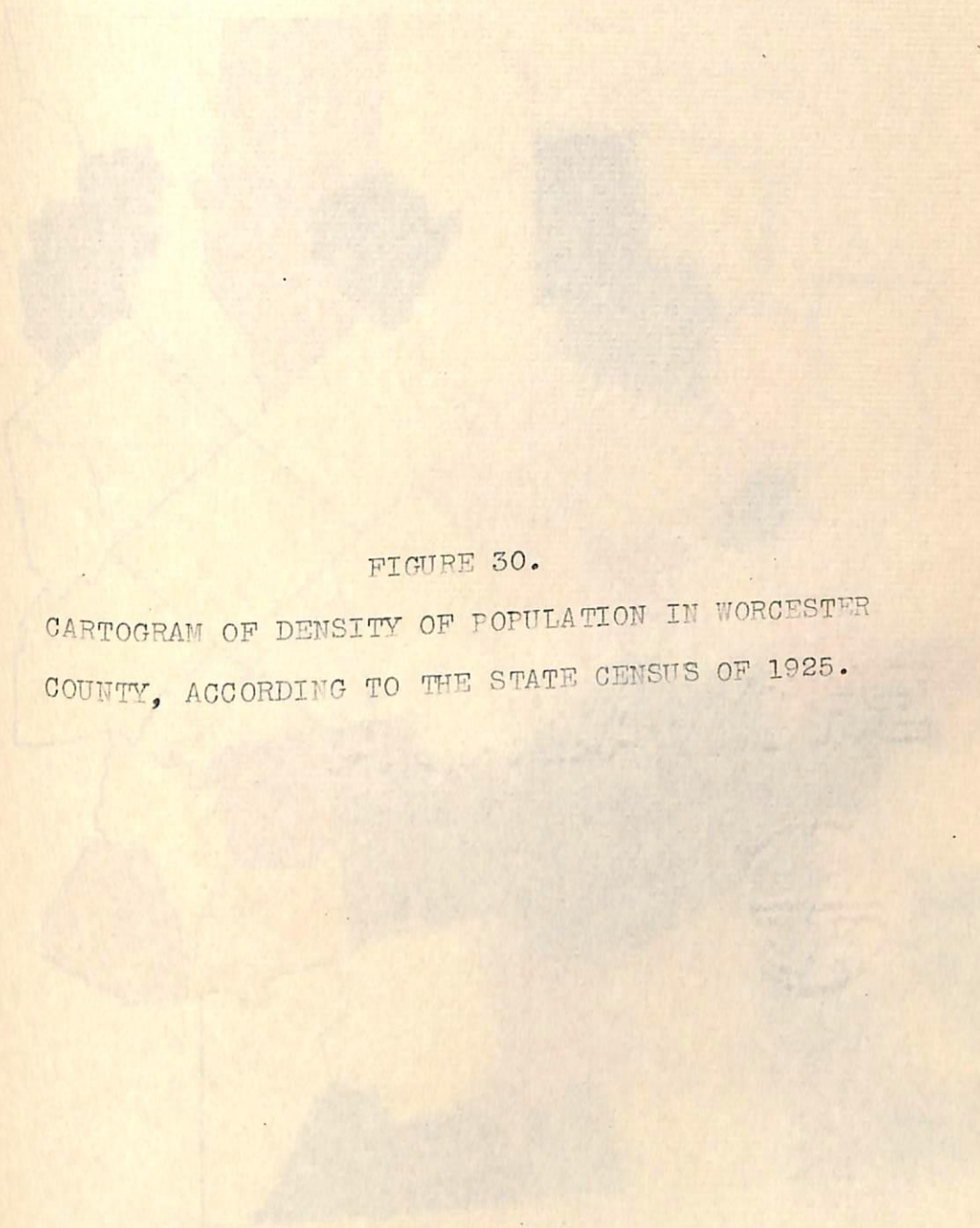
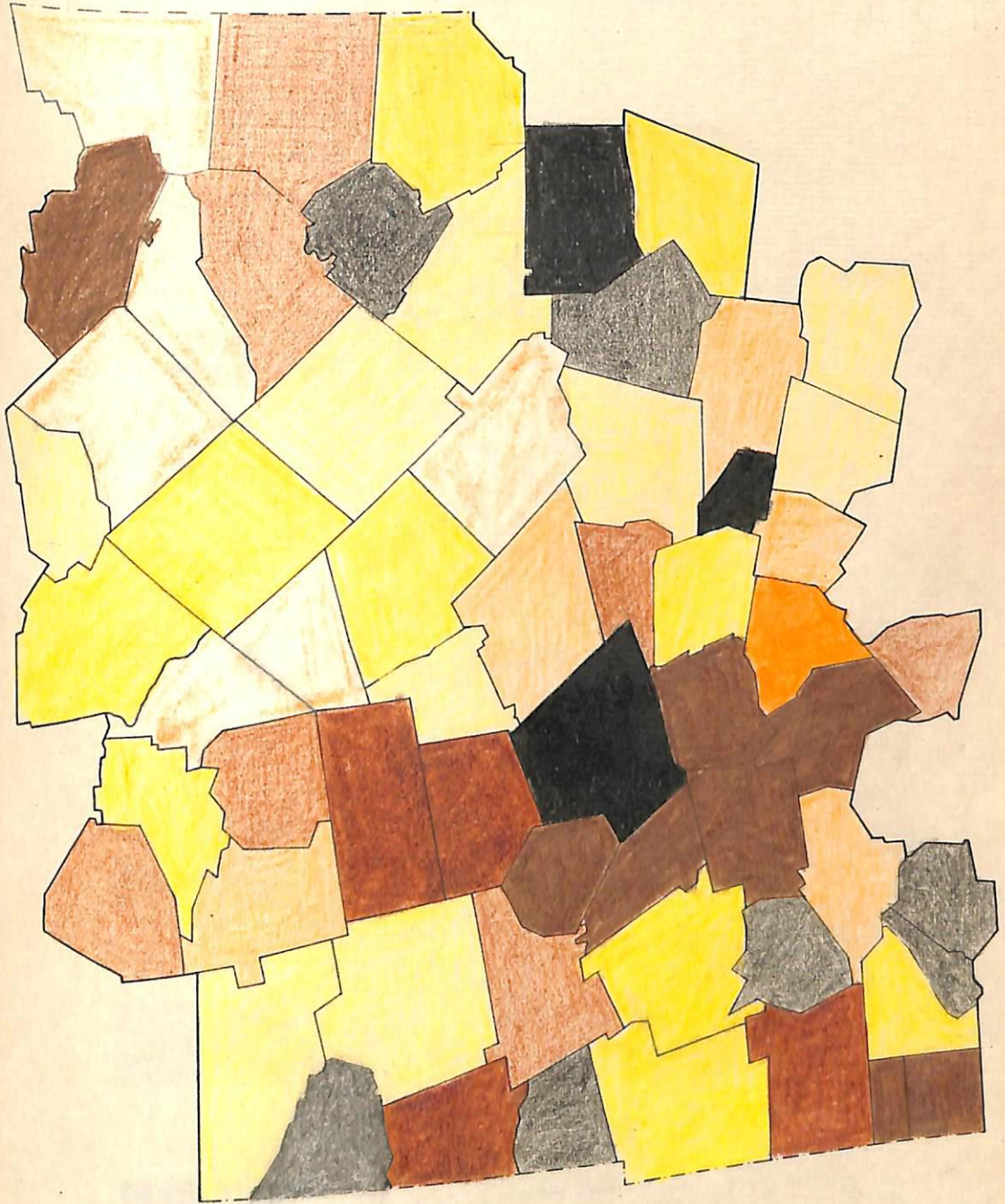
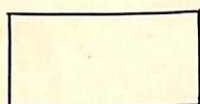


FIGURE 30.

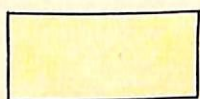
CARTOGRAM OF DENSITY OF POPULATION IN WORCESTER
COUNTY, ACCORDING TO THE STATE CENSUS OF 1925.



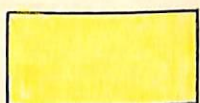
KEY TO THE CARTOGRAMS REPRESENTING THE PERCENTAGE OF PEOPLE ENGAGED IN NON-AGRICULTURAL OCCUPATIONS, OF THE TOTAL NUMBER OF PEOPLE ,ENGAGED IN GAINFUL OCCUPATIONS.



0 to 20 percent.



20 to 30 percent.



30 to 40 percent.



40 to 50 percent.



50 to 65 percent.



65 to 80 percent.



80 to 100 percent.

FIGURE 31.

CARTOGRAM , SHOWING PEOPLE EMPLOYED IN MANUFACTURING
AND TRADE, IN PERCENTAGE OF THE TOTAL NUMBER OF PEOPLE
ENGAGED IN GAINFUL OCCUPATIONS.
DATA FROM THE FEDERAL CENSUS OF 1820.

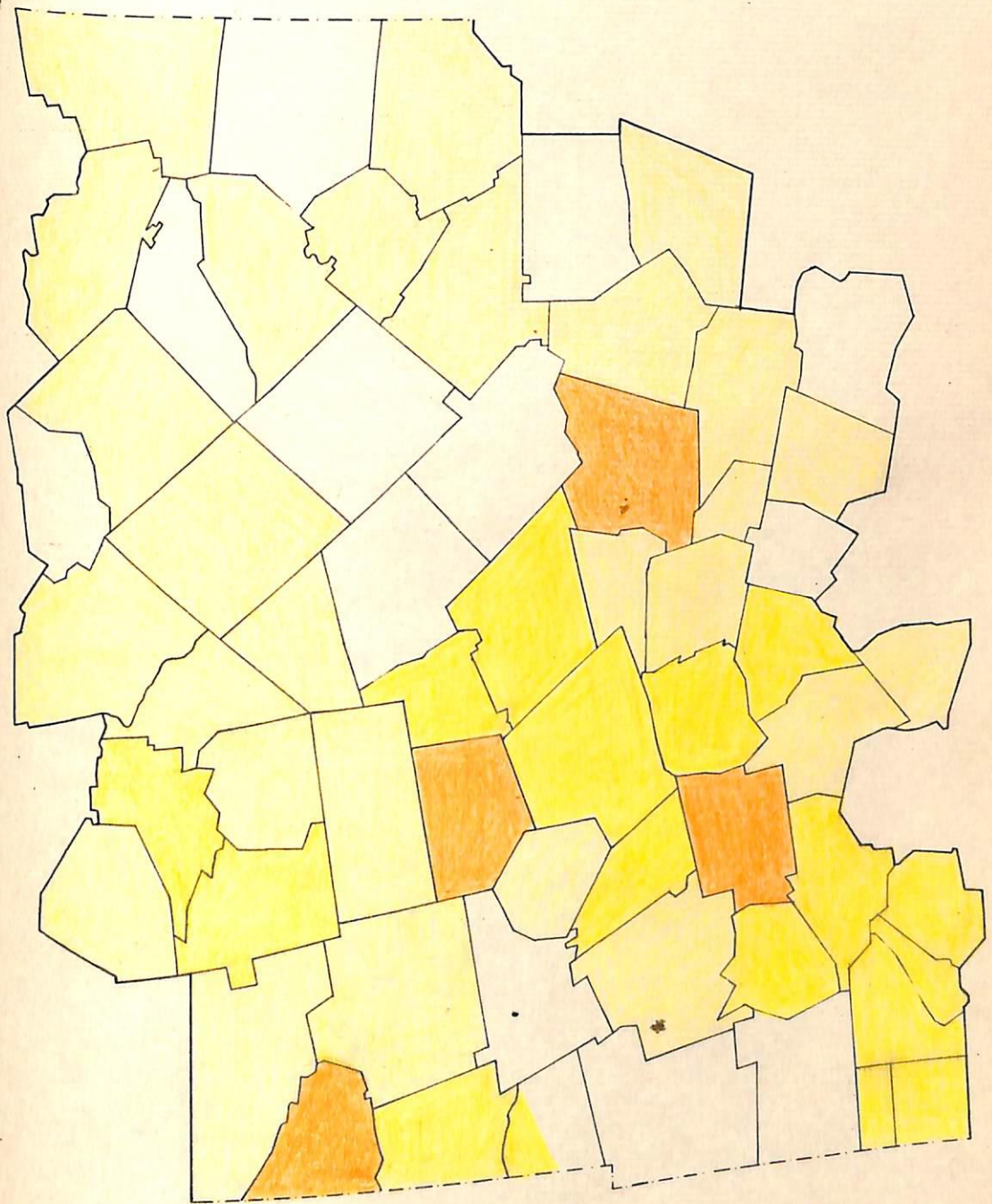


FIGURE 32.

CARTOGRAM, SHOWING PEOPLE EMPLOYED IN MANUFACTURING AND
TRADE, IN PERCENTAGE OF THE TOTAL NUMBER OF PEOPLE
ENGAGED IN GAINFUL OCCUPATIONS.
DATA FROM THE FEDERAL CENSUS OF 1840.

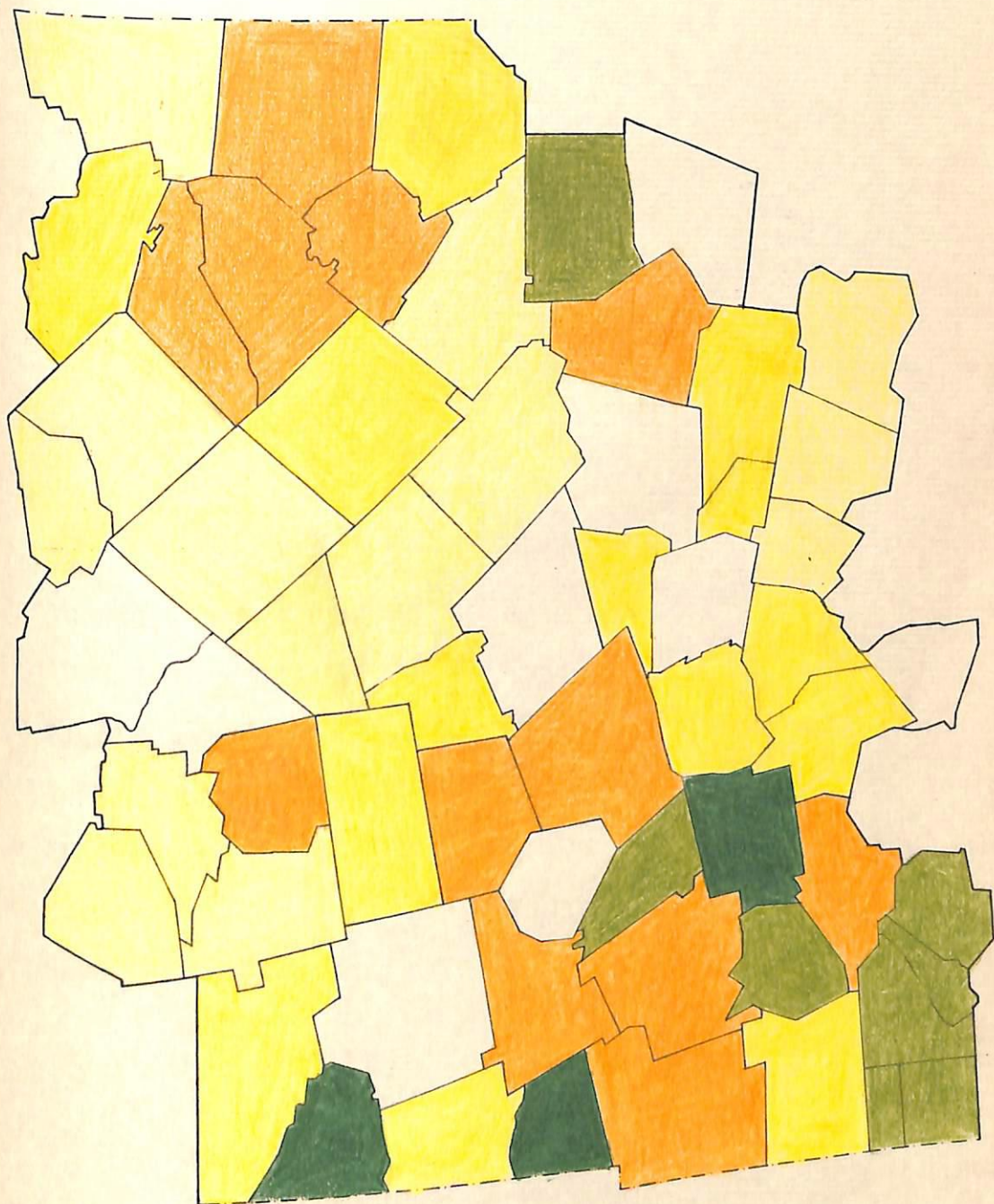
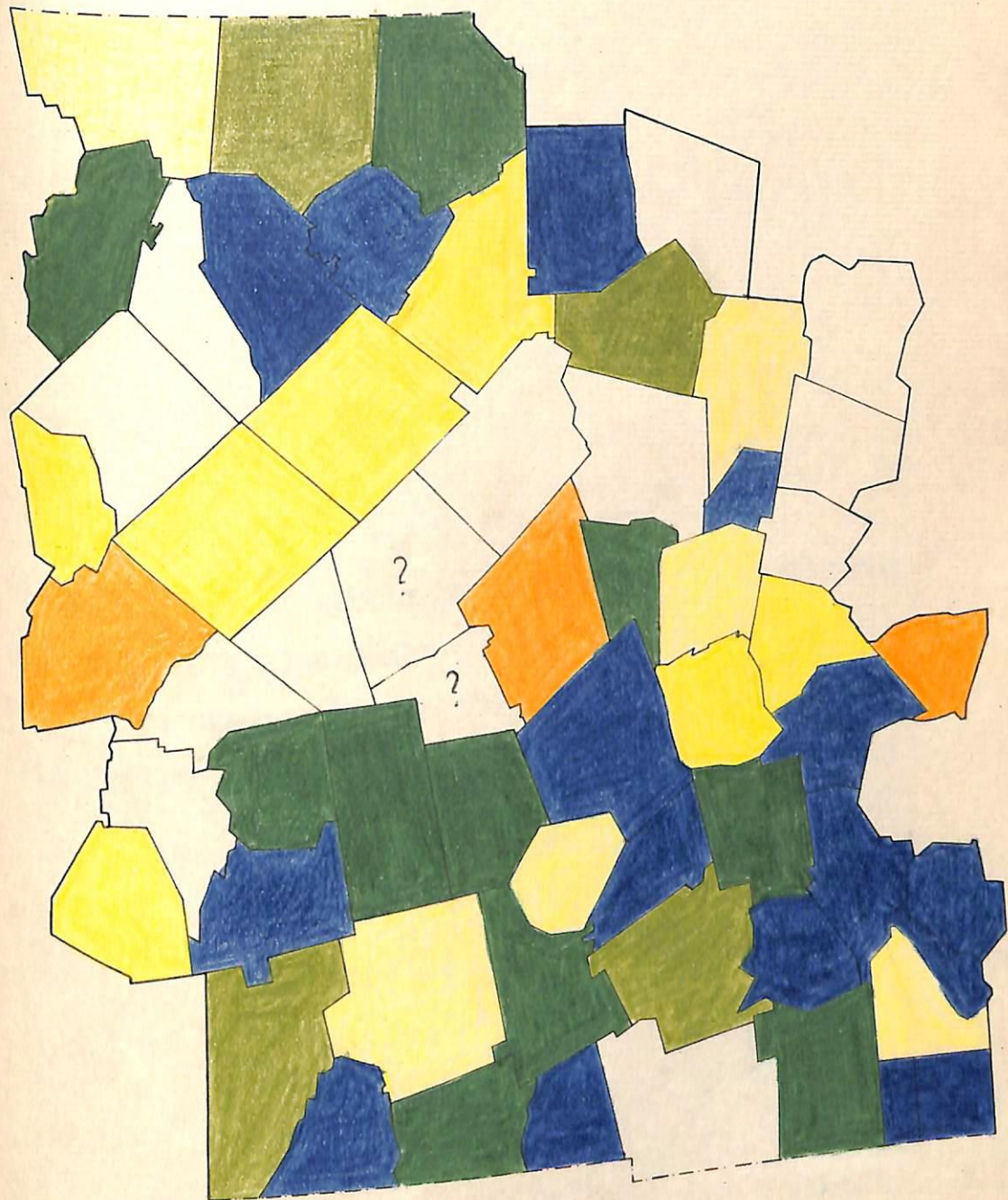


FIGURE 33.

CARTOGRAM, SHOWING PEOPLE EMPLOYED IN MANUFACTURING
(TRADES INCLUDED), IN PERCENTAGE OF THE TOTAL NUMBER
OF PEOPLE ENGAGED IN GAINFUL OCCUPATIONS.

DATA FROM THE STATE CENSUS OF 1865.

NO SEPARATE DATA ARE GIVEN FOR PEOPLE EMPLOYED IN
COMMERCE.



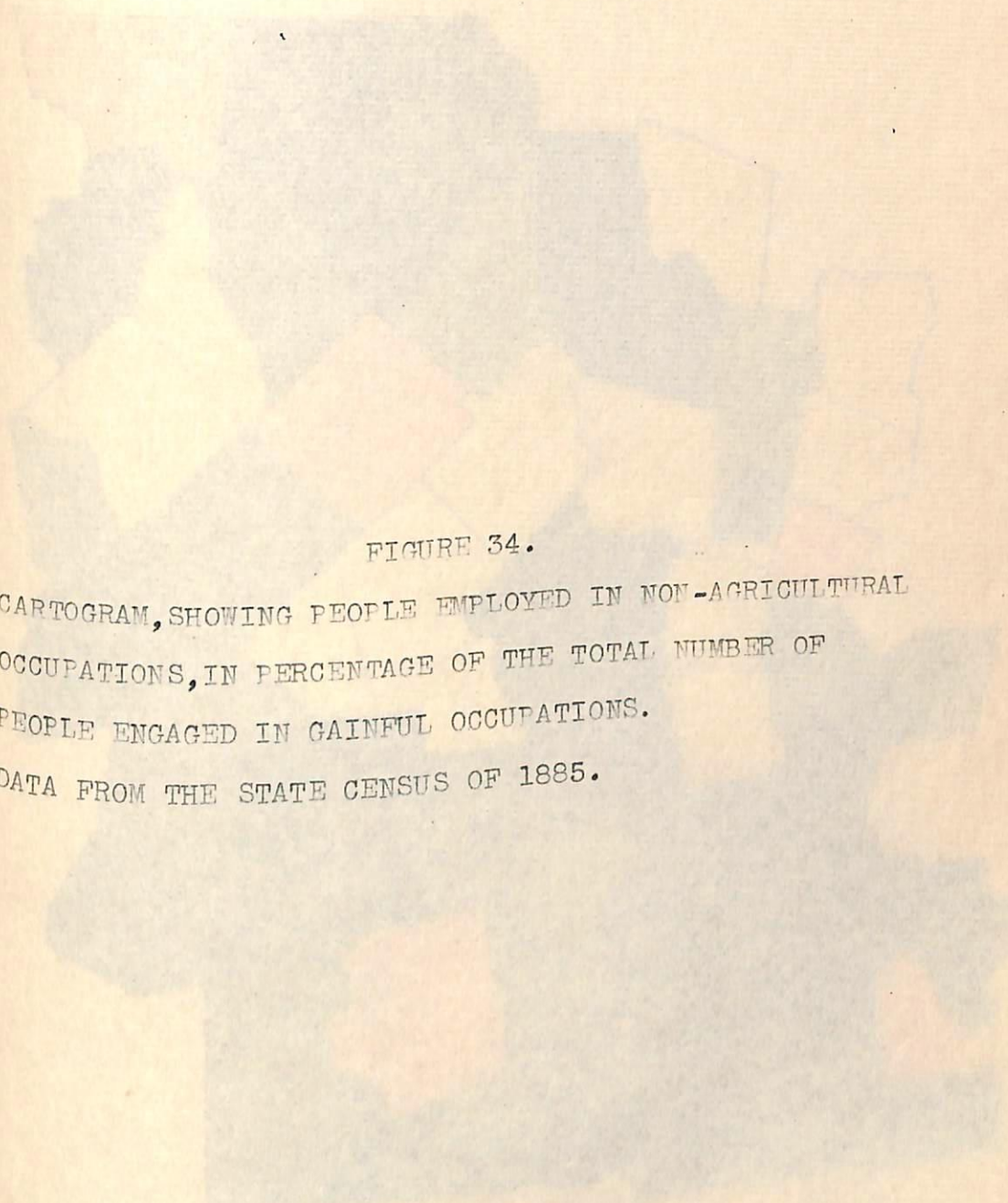


FIGURE 34.
CARTOGRAM, SHOWING PEOPLE EMPLOYED IN NON-AGRICULTURAL
OCCUPATIONS, IN PERCENTAGE OF THE TOTAL NUMBER OF
PEOPLE ENGAGED IN GAINFUL OCCUPATIONS.
DATA FROM THE STATE CENSUS OF 1885.

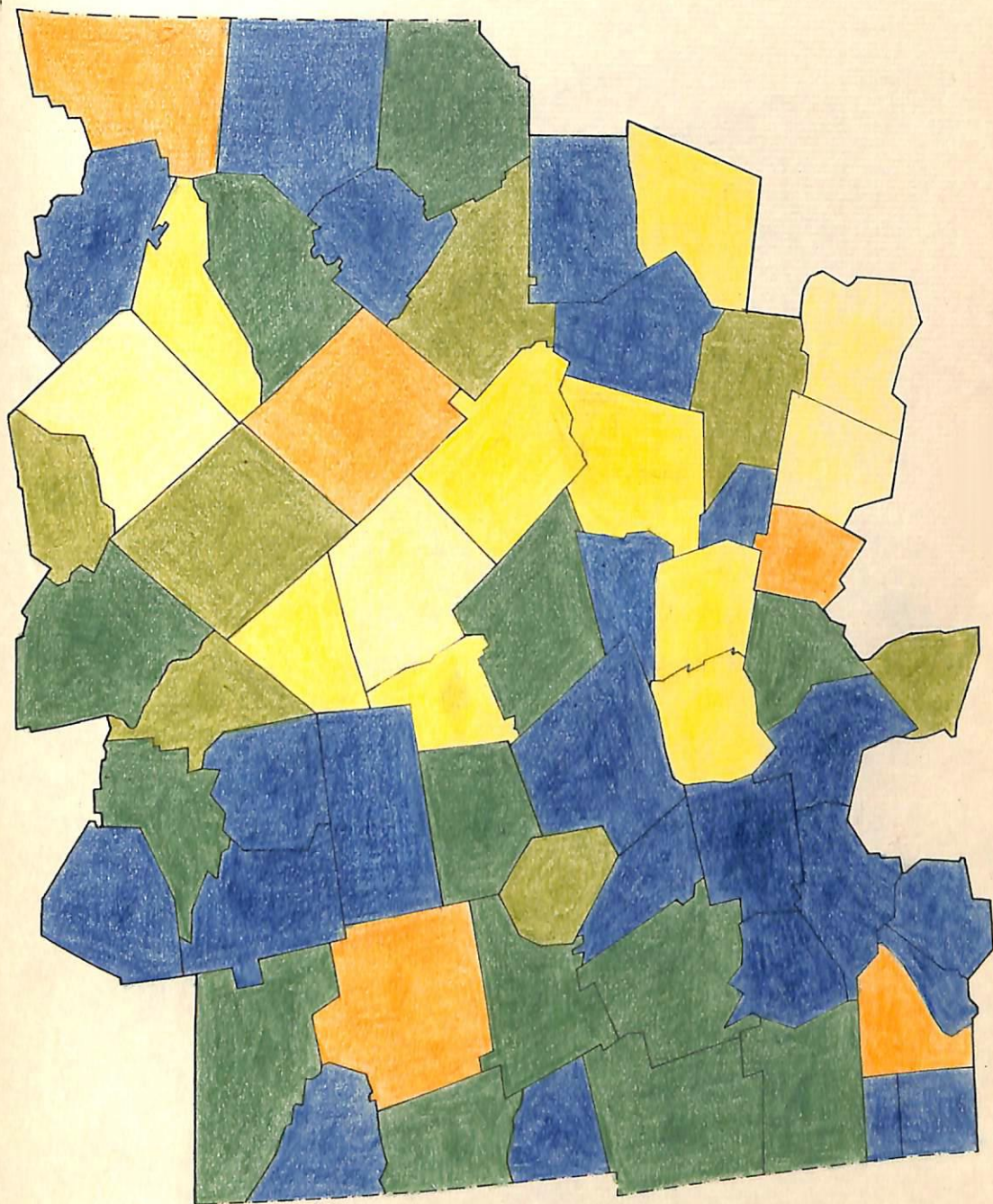
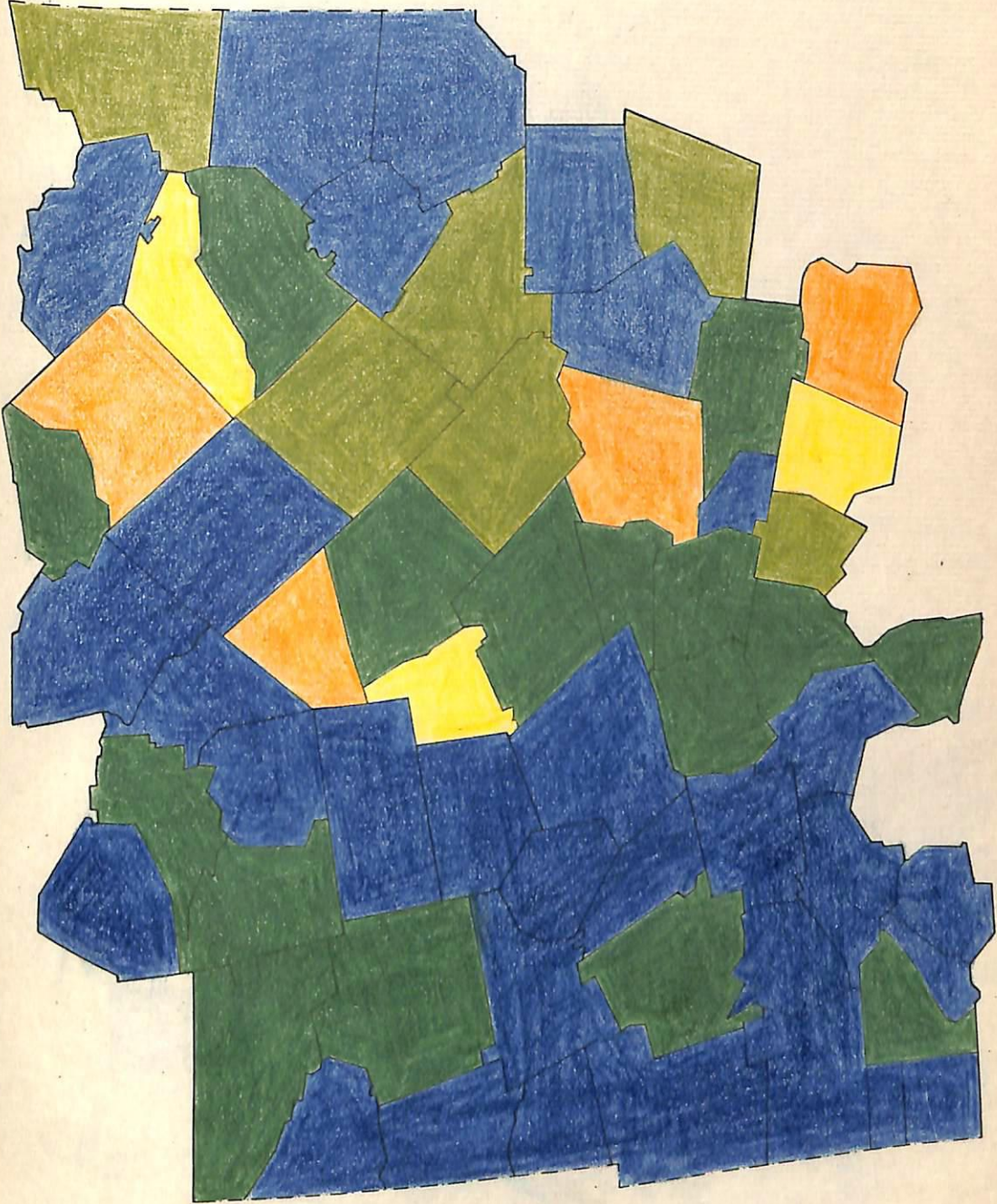
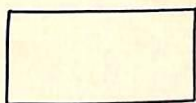


FIGURE 35.

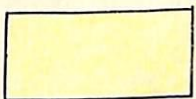
CARTOGRAM, SHOWING PEOPLE EMPLOYED IN NON-AGRICULTURAL
OCCUPATIONS, IN PERCENTAGE OF THE TOTAL NUMBER OF
PEOPLE ENGAGED IN GAINFUL OCCUPATIONS.
DATA FROM THE STATE CENSUS OF 1915.



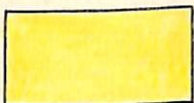
KEY TO THE CARTOGRAMS REPRESENTING THE FOREIGN-BORN
PEOPLE, IN PERCENTAGE OF THE TOTAL POPULATION.



0 to 5 percent.



5 to 15 percent.



15 to 25 percent.



25 to 35 percent.




35 to 50 percent.



50 to 75 percent.

FIGURE 36.



CARTOGRAM, SHOWING THE PERCENTAGE OF ALIENS AND NOT
NATURALIZED FOREIGNERS IN WORCESTER COUNTY, ACCORDING
TO THE FEDERAL CENSUS OF 1830.

THE TOWNS WITH 1 TO 5 PERCENT OF FOREIGNERS ARE
HACHURED YELLOW.

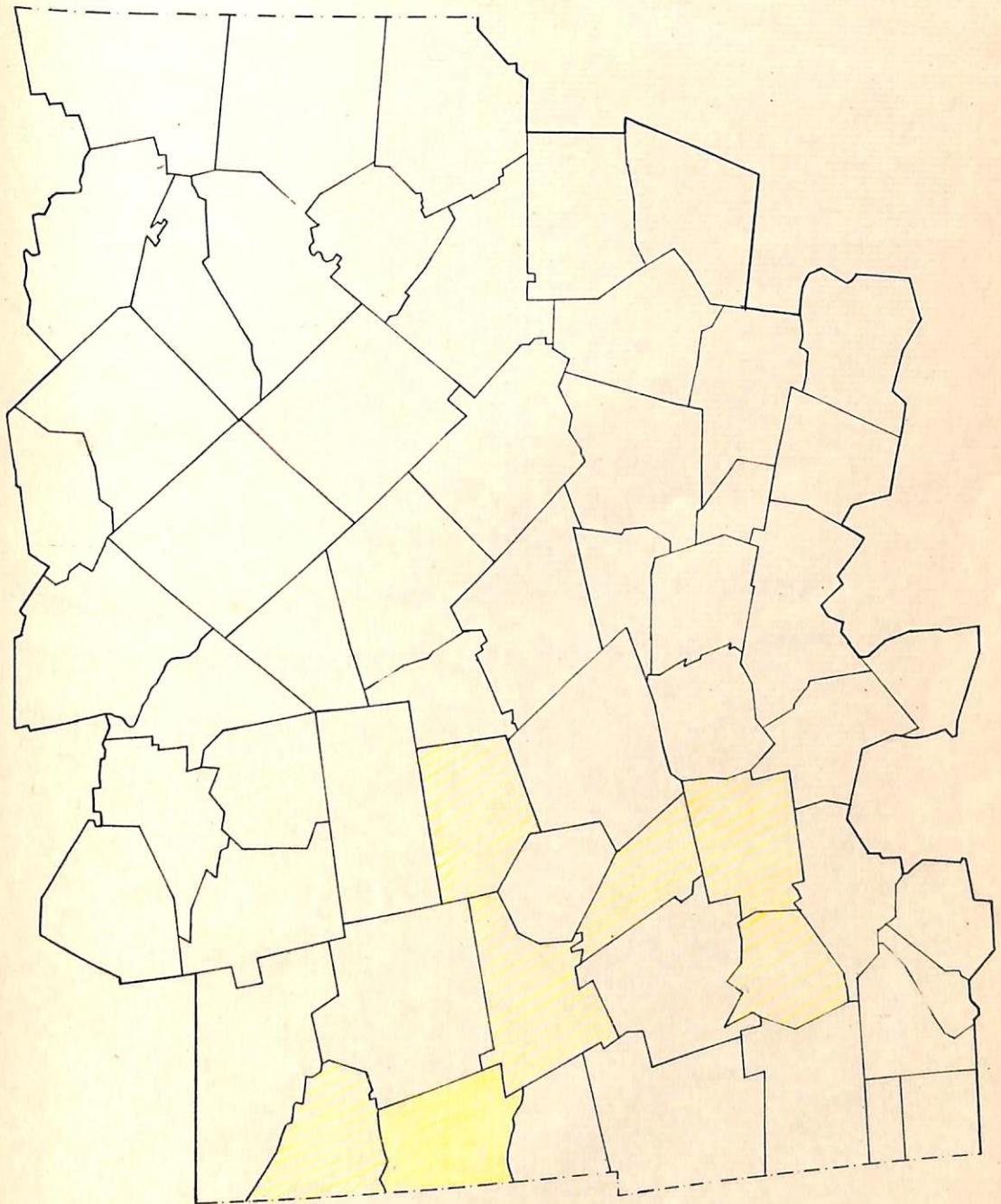


FIGURE 37.

CARTOGRAM, SHOWING THE PERCENTAGE OF FOREIGN-BORN
PEOPLE IN WORCESTER COUNTY, ACCORDING TO THE STATE
CENSUS OF 1855.

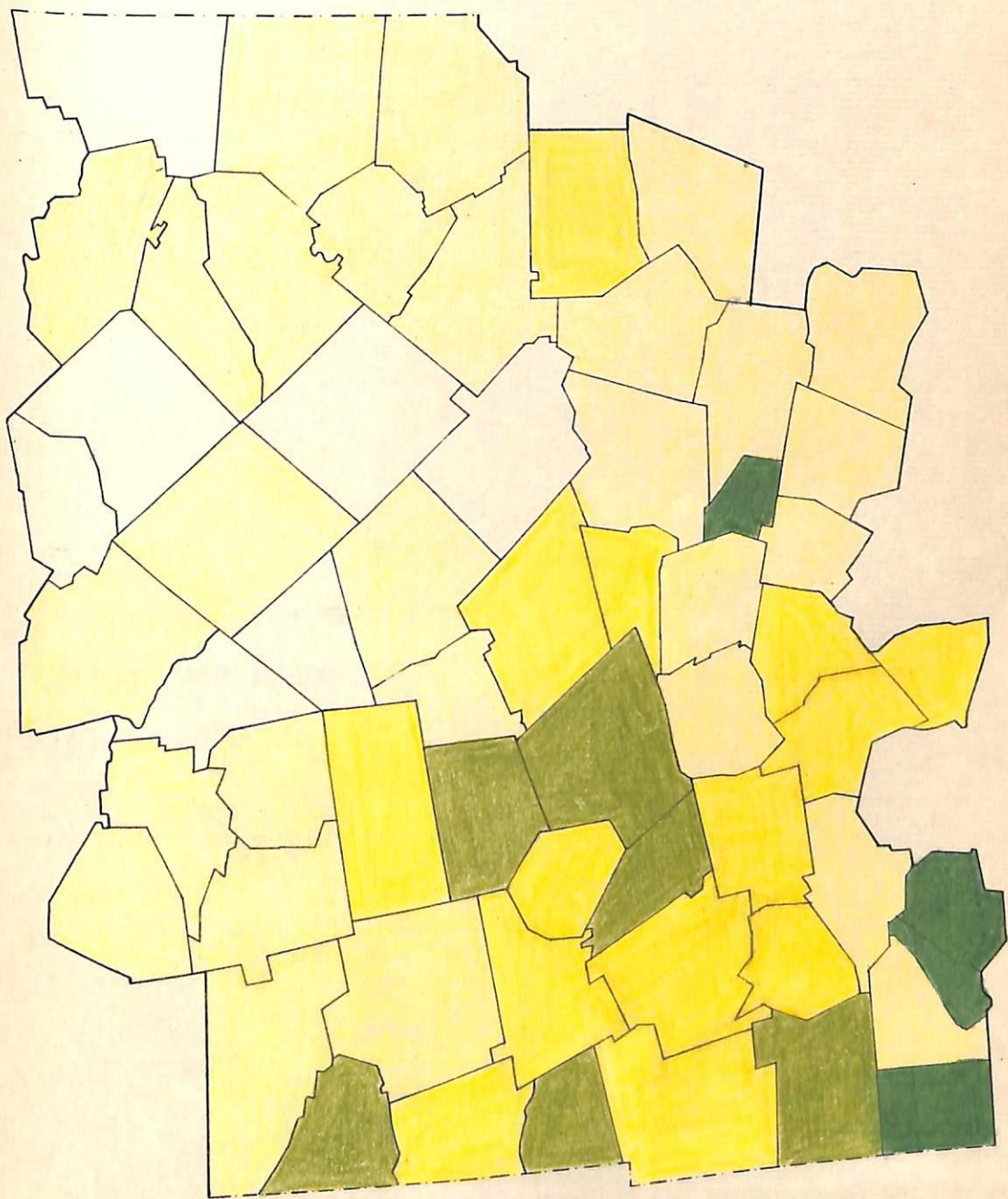


FIGURE 38.

CARTOGRAM, SHOWING THE PERCENTAGE OF FOREIGN-BORN
PEOPLE IN WORCESTER COUNTY, ACCORDING TO THE STATE
CENSUS OF 1885.

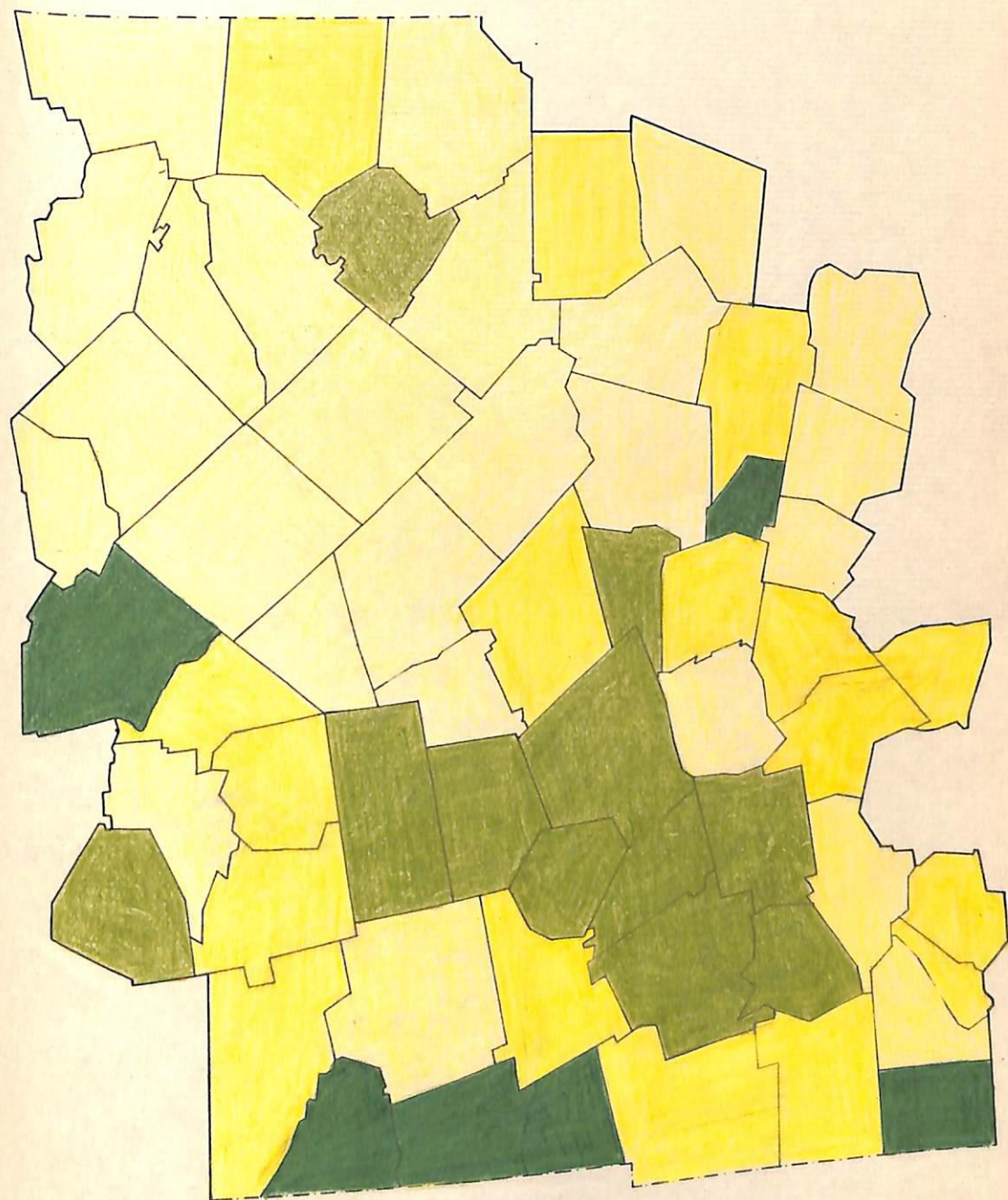


FIGURE 39.

CARTOGRAM, SHOWING THE PERCENTAGE OF PEOPLE OF PURE FOREIGN STOCK (FOREIGN-BORN PEOPLE AND NATIVE-BORN PEOPLE WHOSE PARENTS WERE BOTH FOREIGN-BORN) IN WORCESTER COUNTY, ACCORDING TO THE STATE CENSUS OF 1885.

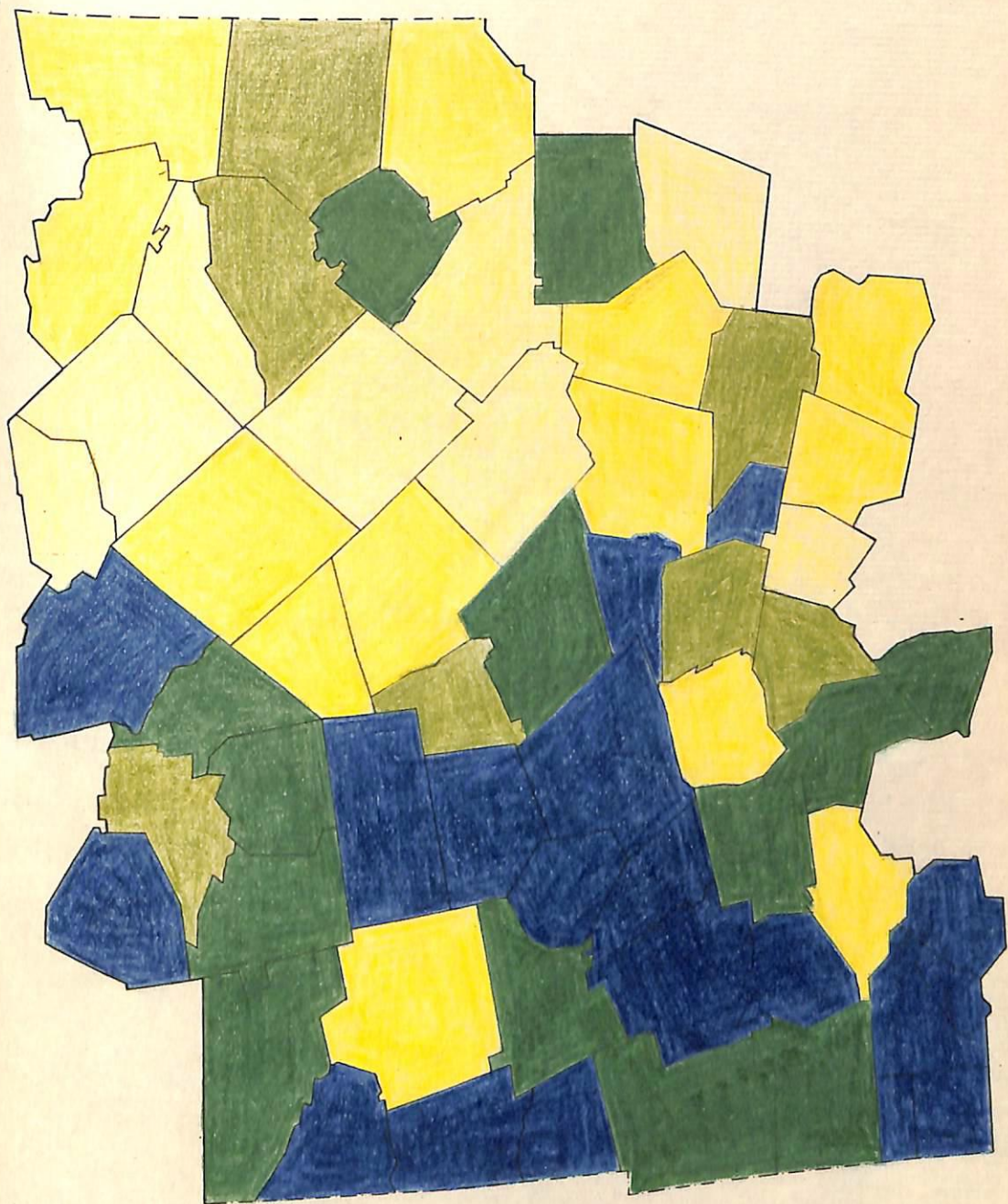


FIGURE 40.

CARTOGRAM, SHOWING THE PERCENTAGE OF FOREIGN-BORN
PEOPLE IN WORCESTER COUNTY, ACCORDING TO THE STATE
CENSUS OF 1915.

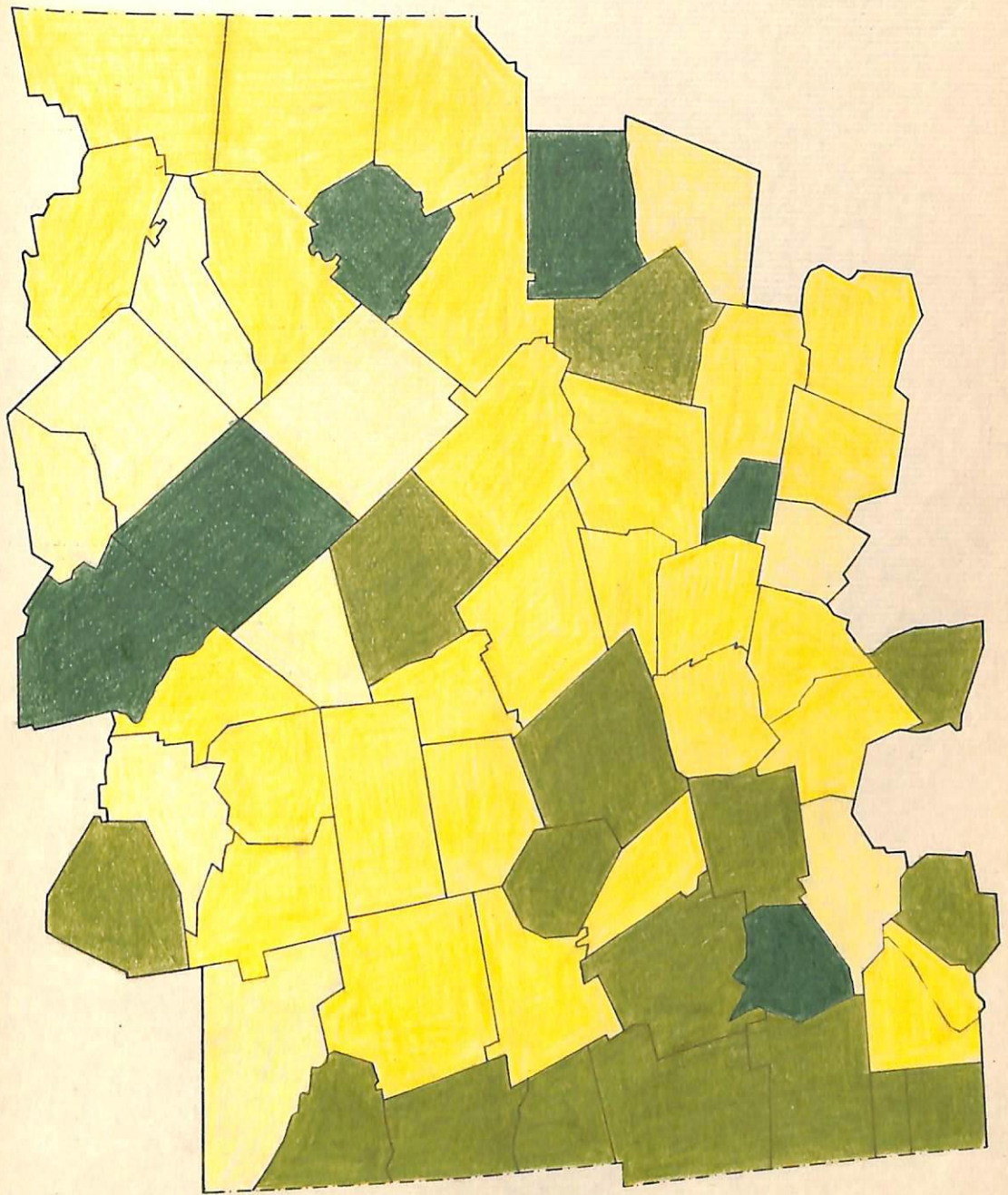
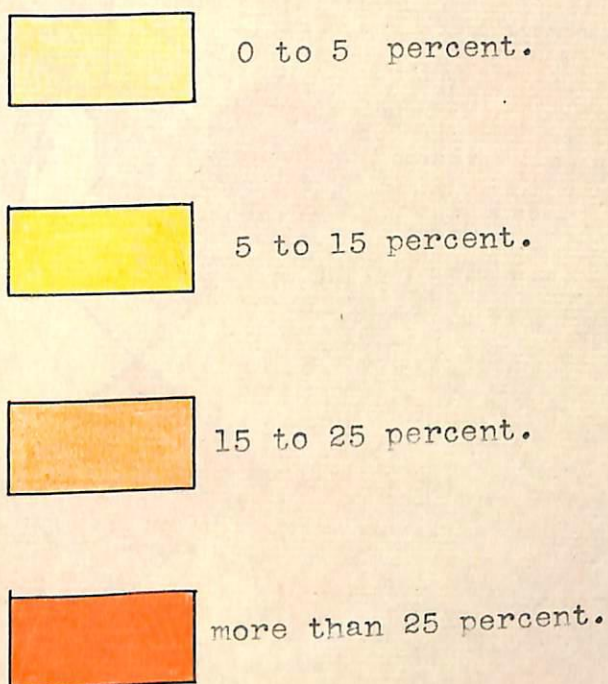
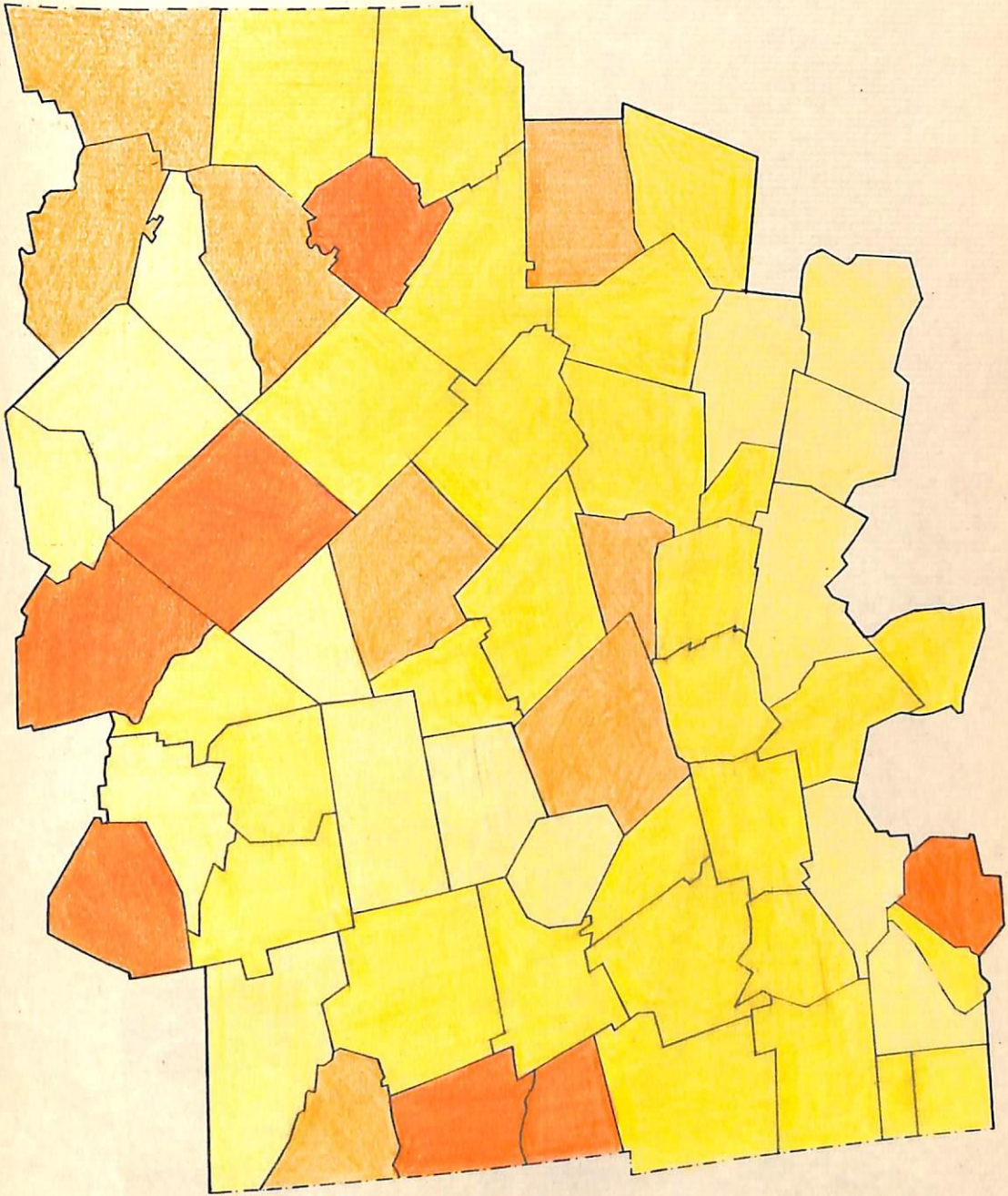


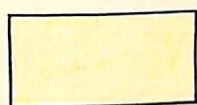
FIGURE 41.

CARTOGRAM, SHOWING THE PERCENTAGE OF PEOPLE OF SOUTHERN AND EASTERN EUROPEAN STOCK (FOREIGN-BORN AND NATIVE-BORN WHOSE PARENTS WERE BOTH FOREIGN-BORN) IN WORCESTER CO. ACCORDING TO THE STATE CENSUS OF 1915.





KEY TO THE CARTOGRAMS REPRESENTING THE PERCENTAGE
OF THE AREA OF THE TOWNS, USED FOR AGRICULTURAL
PURPOSES.



0 to 10 percent.



10 to 20 percent.



20 to 30 percent.



30 to 40 percent.



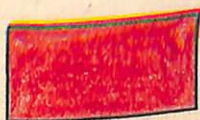
40 to 50 percent.



50 to 60 percent.



60 to 70 percent.



more than 70 percent.

FIGURE 42.

CARTOGRAM, SHOWING THE PERCENTAGE OF LAND USED FOR
AGRICULTURAL PURPOSES IN WORCESTER COUNTY, ACCORDING
TO THE RETURNS OF THE ASSESSORS FOR THE YEAR 1791.

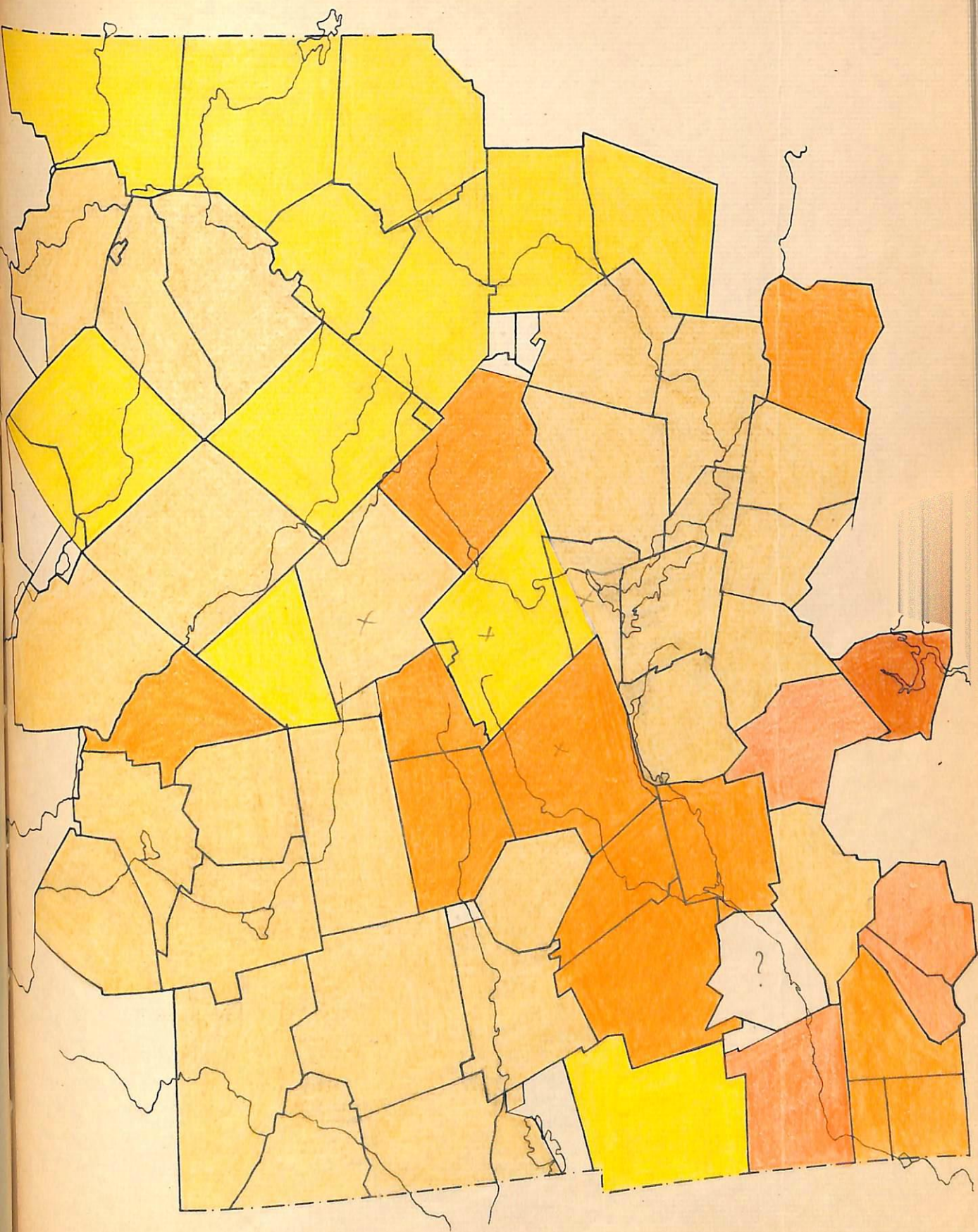


FIGURE 43.

CARTOGRAM, SHOWING THE PERCENTAGE OF LAND USED FOR
AGRICULTURAL PURPOSES IN WORCESTER COUNTY, ACCORDING
TO THE RETURNS OF THE ASSESSORS FOR THE YEAR 1831.

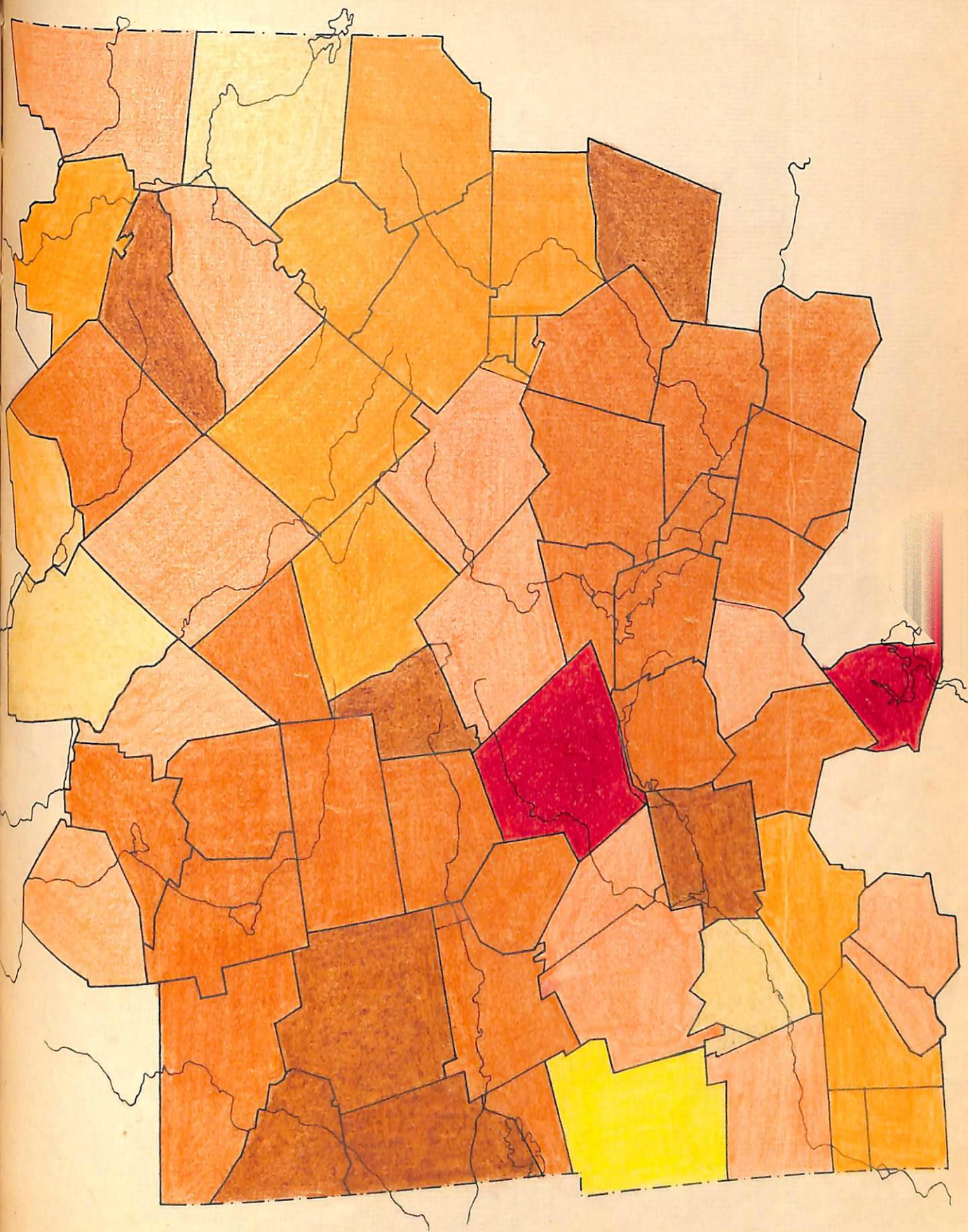


FIGURE 44.

CARTOGRAM, SHOWING THE PERCENTAGE OF LAND USED FOR AGRICULTURAL PURPOSES IN WORCESTER COUNTY, ACCORDING TO THE RETURNS OF THE ASSESSORS FOR THE YEAR 1851.

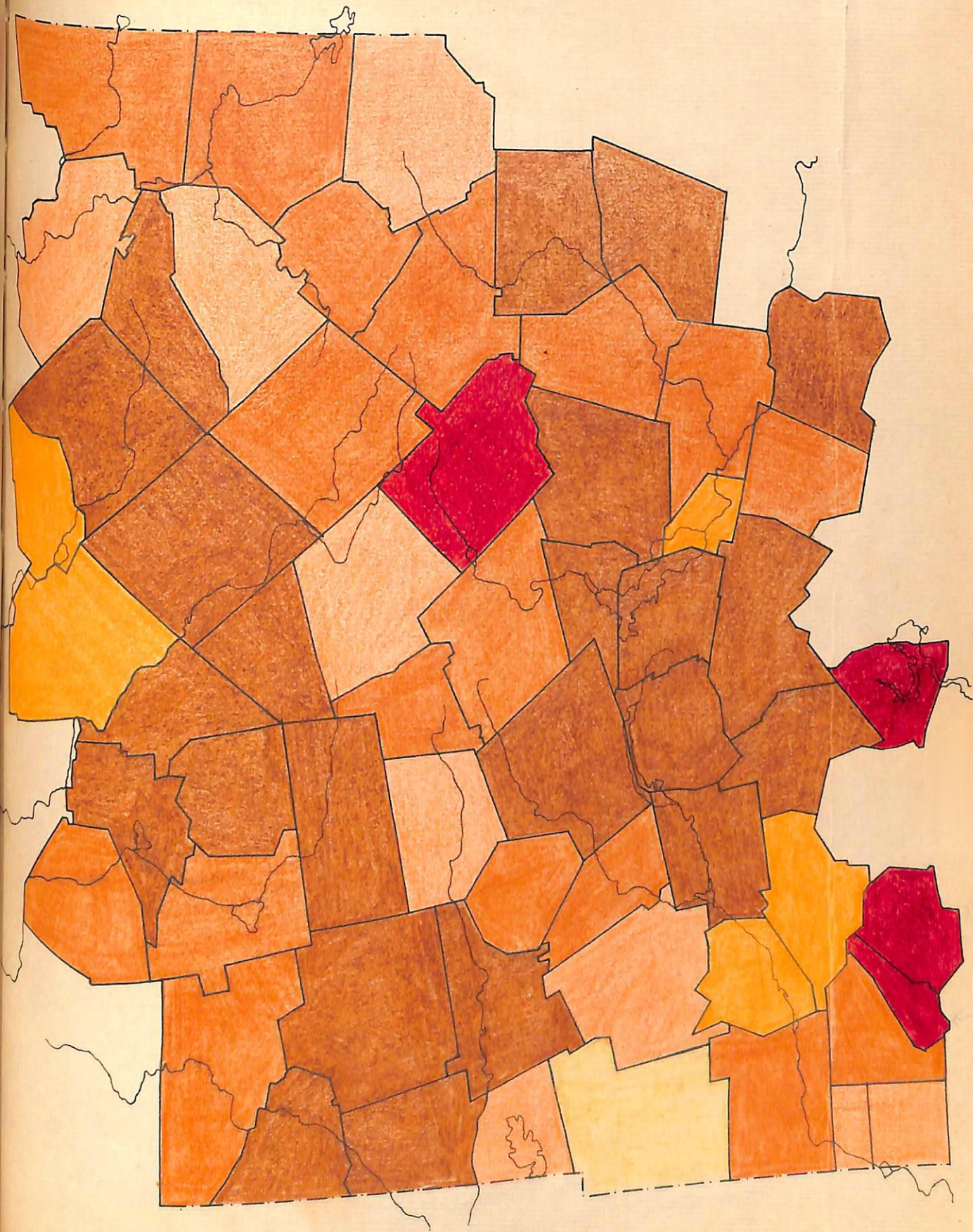


FIGURE 45.

CARTOGRAM, SHOWING THE PERCENTAGE OF LAND USED FOR
AGRICULTURAL PURPOSES IN WORCESTER COUNTY, ACCORDING
TO THE STATE CENSUS OF 1885.

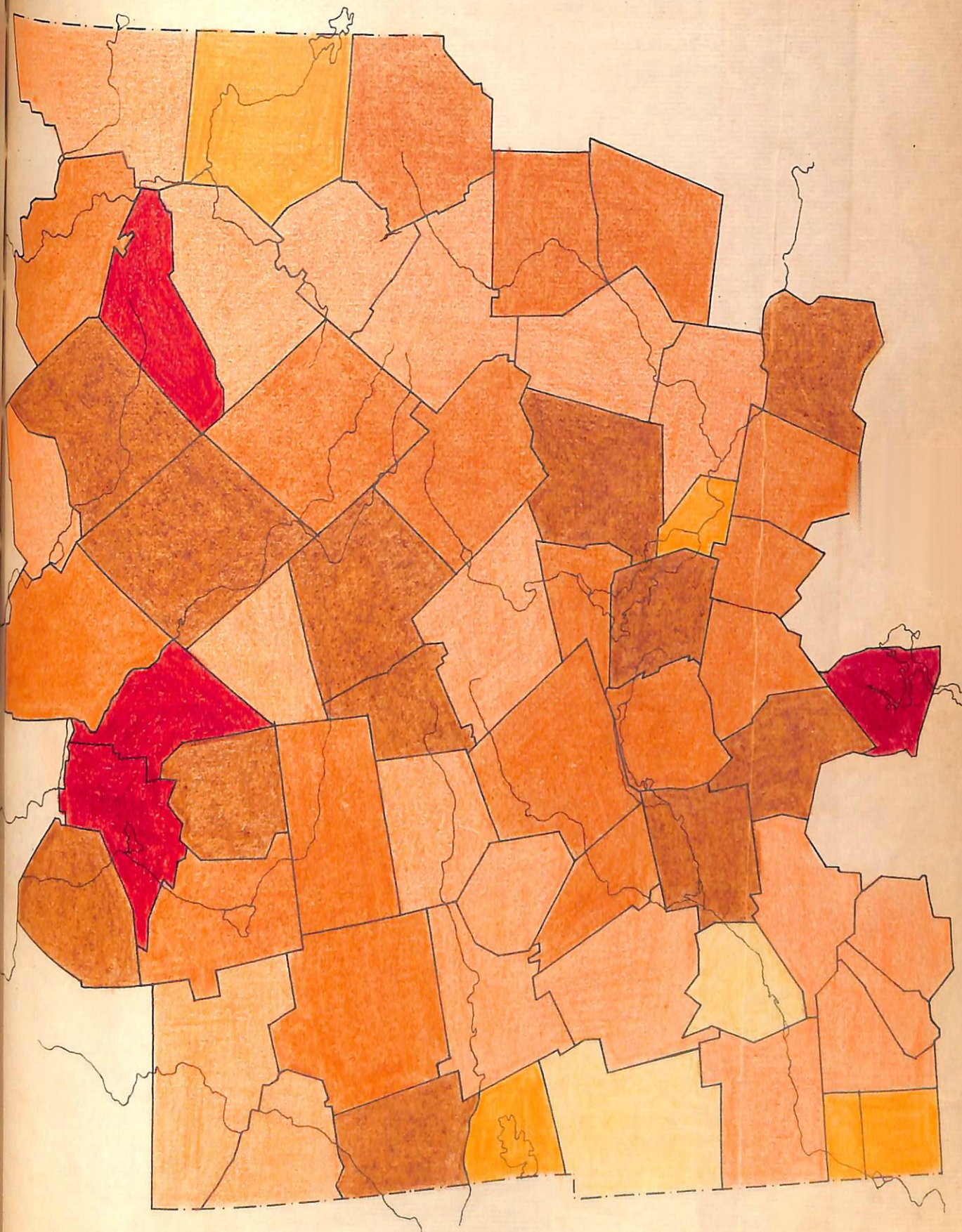


FIGURE 46.

CARTOGRAM, SHOWING THE PERCENTAGE OF LAND USED FOR
AGRICULTURAL PURPOSES IN WORCESTER COUNTY, ACCORDING
TO THE REPORT OF THE STATE FORESTER OF 1916.

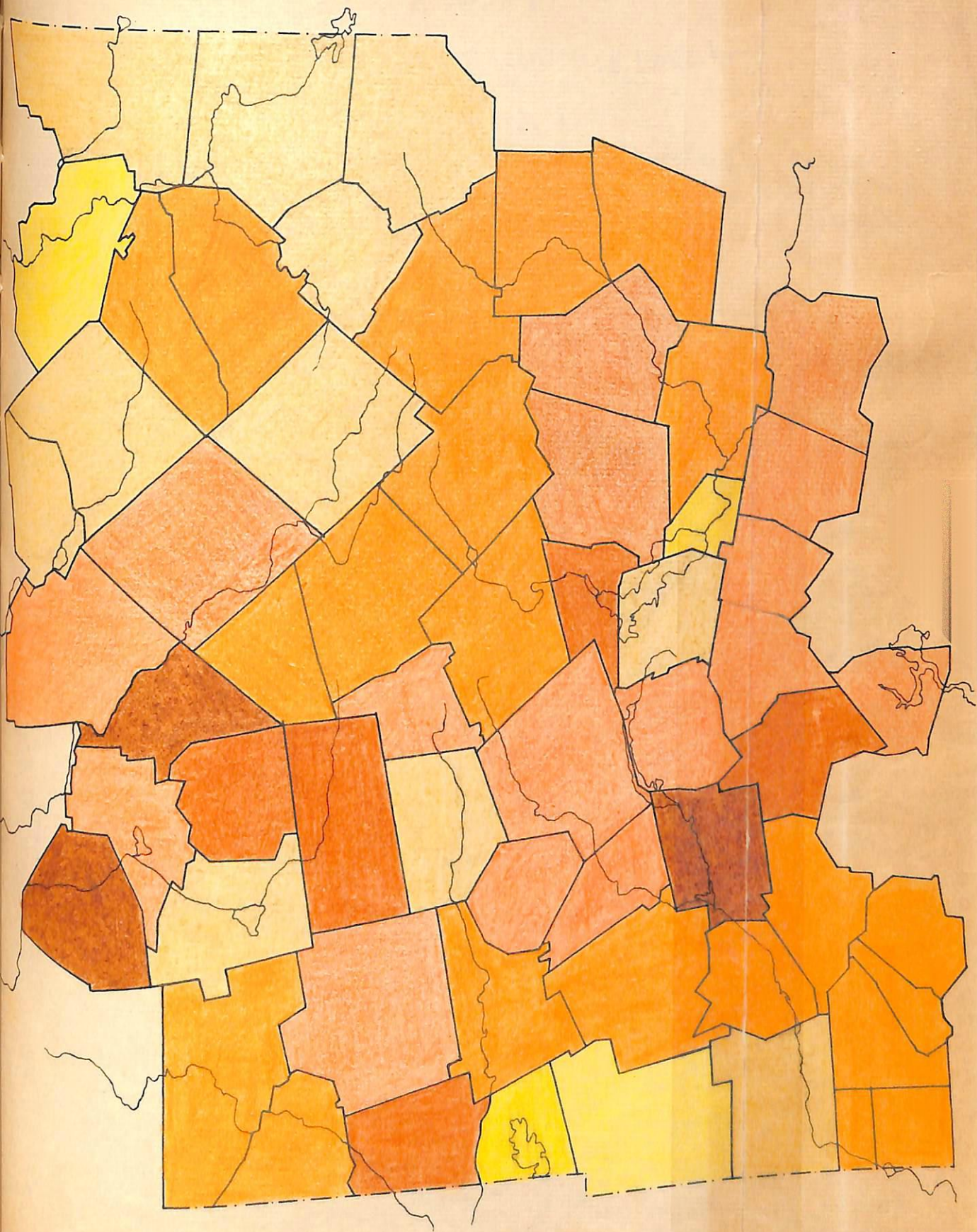


TABLE I

POPULATION AND DENSITY OF POPULATION
IN WORCESTER COUNTY IN 1765

(See fig. 4)

numbers on map	names of towns	area in sq. kilometers	population	density of population
1	Winchendon	131.6	-	-
2	Ashburnham	128.8	-	-
3	Athol (Pequoig)	110.0	359	3.4
4	Templeton	132.0	348	2.6
5	Westminster	118.4	468	4.0
6	Lunenburg	171.2	821	4.8
7	Petersham	116.0	707	6.1
8	District of Rutland	223.6	734	3.3
9	District of Princeton	54.0	284	5.3
10	"No town"			
11	Leominster	64.0	743	11.6
12	Lancaster	205.6	1999	9.7
13	Harvard	75.2	1126	15.0
14	Bolton	91.2	933	10.3
15	Hardwick	115.2	1010	8.8
16	District of New Braintree	45.6	594	13.8
17	District of Oakham	50.8	270	5.3
18	Rutland	110.8	1090	9.8
19	Holden	101.2	495	4.9
20	Warren (Western)	69.6	583	8.3
21	Brookfield	194.4	1811	9.3
22	Spencer	87.6	664	7.5

numbers on map	names of towns	area in sq. kilometers	population	density of population
23	Leicester	88.0	770	8.8
24	Worcester	112.8	1478	13.1
25	Shrewsbury	102.0	1401	13.7
16	Westboro	106.0	1110	10.5
27	Southboro	40.0	731	18.3
28	Sturbridge	138.0	899	6.5
29	District of Charlton	123.6	741	6.0
30	Oxford	83.6	890	10.6
31	Sutton	144.0	2120	14.7
32	Grafton	56.8	763	13.4
33	Upton	56.8	619	10.9
34	Dudley	82.4	760	9.3
35	District of Douglas	98.4	521	5.3
36	Uxbridge	112.8	1213	10.7
37	Mendon	142.4	1843	13.0

TABLE II.

ACRES OF TILLED LAND ACCORDING TO THE RETURN
OF THE ASSESSORS.

names of towns	1791	1811	1831	1851
Lancaster	1106	1001	1093	996
Mendon	590	742	930	1068
Charlton	865	1133	1405	1154
Leicester	315	333	484	438
Hubbardston	301	406	676	616
Westborough	883	900	934	835
Lunenburg	799	613	781	604
Petersham	761	865	959	913
Royalston	289	480	689	537
Ashburnham	247	405	511	501
Rutland	523	633	670	655
Oakham	358	472	698	569
Southborough	414	542	630	747
Shrewsbury	534	654	829	846
Harvard	844	742	843	847
Douglas	581	573	715	560
Westminster	426	620	661	663
Barre	877	1144	1365	1424
Western (Warren)	553	532	1017	911
Gerry (Phillipston)	293	412	521	472

TABLE III.

NUMBER OF COWS AND SWINE IN SOME TOWNS
OF WORCESTER COUNTY

names of towns	1831	1851	1831	1851
	cows	cows	swine	swine
Ashburnham	1484	1279	224	129
Barre	3331	3025	612	291
Bolton	1095	1090	222	164
Charlton	2468	2109	406	333
Harvard	1554	1301	281	200
New Braintree	1570	1499	341	254
Petersham	2229	1814	302	168
Rutland	1737	1507	277	138
Westminster	1654	1542	289	196
Royalston	1805	1779	357	137

POPULATION OF TOWNS IN WORCESTER COUNTY.

	Ashburnham	Athol	Auburn
1765	551	359	-
1776	551	848	-
1790	951	848	473
1800	994	993	532
1810	1 036	1 041	540
1820	1 230	1 211	608
1830	1 402	1 325	690
1840	1 652	1 591	649
1850	1 875	2 034	879
1855	2 211	2 395	885
1860	2 108	2 604	914
1865	2 153	2 814	959
1870	2 172	3 517	1 178
1875	2 141	4 134	1 233
1880	1 666	4 307	1 317
1885	2 058	4 758	1 268
1890	2 074	6 319	1 532
1895	2 148	7 364	1 598
1900	1 882	7 061	1 621
1905	1 851	7 197	2 006
1910	2 107	8 536	2 420
1915	2 059	9 783	3 281
1920	2 012	9 792	3 891
1925	2 159	9 602	4 927
	Barre	Berlin	Blackstone
1765	734	-	-
1776	1 329	-	-
1790	1 613	512	-
1800	1 937	590	-
1810	1 971	591	-
1820	2 077	625	-
1830	2 503	692	-
1840	2 751	763	-
1850	2 751	866	4 391
1855	2 976	976	5 346
1860	2 787	1 106	5 453
1865	2 973	1 061	4 857
1870	2 856	1 016	5 421
1875	2 572	987	4 640
1875	2 460	977	4 907
1880	2 419	899	5 436
1885	2 093	884	6 138
1890	2 239	897	6 039
1895	2 278	1 003	5 721
1900	2 059	906	5 786
1905	2 558	904	5 648
1910	2 957	865	5 689
1915	3 476	868	4 299
1920	3 357	1 071	4 802
1925	3 329		

	Bolton	Boylston	Brookfield
1765	925	-	1 811
1776	1 210	-	2 649
1790	861	839	3 100
1800	945	1 058	3 284
1810	1 037	800	3 170
1820	1 229	902	2 292
1830	1 253	820	2 342
1840	1 186	797	2 472
1850	1 263	918	1 674
1855	1 255	835	2 007
1860	1 348	929	2 276
1865	1 502	792	2 101
1870	1 014	800	2 527
1875	987	895	2 660
1880	903	854	2 820
1885	876	834	3 013
1890	827	770	3 352
1895	797	729	3 279
1900	770	1 364	3 062
1905	762	649	2 388
1910	764	714	2 204
1915	768	783	2 059
1920	708	794	2 216
1925	801	970	1 401

	Charlton	Clinton	Dana
1765	739	-	-
1776	1 310	-	-
1790	1 965	-	-
1800	2 120	-	625
1810	2 180	-	664
1820	2 134	-	623
1830	2 173	-	691
1840	2 117	-	842
1850	2 015	3 113	824
1855	2 059	3 636	876
1860	2 047	3 859	789
1865	1 925	4 012	758
1870	1 878	5 429	760
1875	1 852	6 781	736
1880	1 900	8 029	695
1885	1 823	8 945	700
1890	1 847	10 424	717
1895	1 877	11 497	790
1900	1 860	13 667	763
1905	2 089	13 105	736
1910	2 032	13 075	712
1915	2 213	13 192	599
1920	1 995	12 979	657
1925	2 295	14 180	

	Douglas	Dudley	Fitchburg
1765	521	748	259
1776	800	875	643
1790	1 079	1 114	1 151
1800	1 083	1 140	1 390
1810	1 142	1 226	1 566
1820	1 375	1 615	1 736
1830	1 742	2 155	2 169
1840	1 617	1 352	2 604
1850	1 878	1 443	5 120
1855	2 320	1 523	6 442
1860	2 442	1 736	7 805
1865	2 155	2 076	8 118
1870	2 182	2 388	11 260
1875	2 202	2 653	12 289
1880	2 241	2 803	12 429
1885	2 205	2 742	15 375
1890	1 908	2 944	22 037
1895	2 026	3 203	26 409
1900	2 113	3 553	31 531
1905	2 120	3 818	33 021
1910	2 152	4 267	37 826
1915	2 179	4 373	39 656
1920	2 181	3 701	41 029
1925	2 363	4 594	43 609
	Gardner	Grafton	Hardwick
1765	-	763	1 010
1776	-	861	1 393
1790	531	872	1 725
1800	667	985	1 727
1810	815	946	1 657
1820	911	1 154	1 836
1830	1 023	1 889	1 885
1840	1 260	2 943	1 789
1850	1 533	3 904	1 631
1855	2 183	4 409	1 523
1860	2 646	4 317	1 521
1865	2 533	3 961	1 967
1870	3 333	4 594	2 219
1875	3 730	4 442	1 992
1880	4 988	4 030	2 233
1885	7 283	4 498	3 145
1890	8 424	5 002	2 922
1895	9 182	5 101	2 655
1900	10 813	4 869	3 203
1905	12 012	5 052	3 261
1910	14 699	5 705	3 524
1915	16 376	6 250	3 596
1920	16 971	6 887	3 085
1925	18 730	6 973	3 046

	Harvard	Holden	Hubbardston
1765	1 126	495	-
1776	1 315	749	488
1790	1 387	1 077	933
1800	1 319	1 142	1 113
1810	1 431	1 072	1 127
1820	1 597	1 402	1 367
1830	1 600	1 719	1 674
1840	1 571	1 874	1 784
1850	1 630	1 933	1 825
1855	1 533	2 114	1 744
1860	1 507	1 945	1 621
1865	1 355	1 846	1 546
1870	1 341	2 062	1 654
1875	1 304	2 180	1 440
1880	1 253	2 499	1 386
1885	1 184	2 471	1 303
1890	1 095	2 623	1 346
1895	1 162	2 602	1 274
1900	1 139	2 464	1 227
1905	1 077	2 640	1 205
1910	1 034	2 147	1 073
1915	1 104	2 514	1 084
1920	2 546	2 970	1 045
1925	996	3 436	1 067

	Hopedale	Lancaster	Leicester
1765	-	1 999	770
1776	-	2 746	1 005
1790	-	1 460	1 076
1800	-	1 584	1 103
1810	-	1 694	1 181
1820	-	1 862	1 252
1830	-	2 014	1 782
1840	-	2 019	1 707
1850	-	1 688	2 269
1855	-	1 728	2 589
1860	-	1 932	2 748
1865	-	1 752	2 527
1870	-	1 845	2 768
1875	-	1 957	2 770
1880	-	2 008	2 779
1885	-	2 008	2 923
1890	1 176	2 050	3 120
1895	1 377	2 201	3 239
1900	2 087	2 180	3 416
1905	2 048	2 478	3 414
1910	2 188	2 406	3 237
1915	2 663	2 464	3 322
1920	2 777	2 585	3 635
1925	3 165	2 461	4 110
		2 678	

	Leominster	Lunenburg	Mendon
1765	743	821	1 838
1776	978	1 265	2 322
1790	1 189	1 277	1 555
1800	1 486	1 243	1 628
1810	1 584	1 371	1 819
1820	1 790	1 209	2 254
1830	1 861	1 317	3 152
1840	2 069	1 272	3 524
1850	3 121	1 249	1 300
1855	3 200	1 224	1 382
1860	3 522	1 212	1 351
1865	3 313	1 167	1 207
1870	3 894	1 121	1 175
1875	5 201	1 153	1 176
1880	5 772	1 101	1 094
1885	5 297	1 071	945
1890	7 269	1 146	919
1895	9 211	1 237	889
1900	12 392	1 332	911
1905	14 297	1 293	922
1910	17 580	1 393	880
1915	17 646	1 610	933
1920	19 744	1 634	961
1925	22 120	1 875	1 030
	Milford	Millbury	New Braintree
1765	-	-	594
1776	-	-	798
1790	839	-	939
1800	907	-	875
1810	973	-	912
1820	1 160	926	888
1830	1 360	1 611	825
1840	1 773	2 171	752
1850	4 819	3 081	852
1855	7 489	3 286	775
1860	9 132	3 296	805
1865	9 108	3 780	752
1870	9 890	4 397	640
1875	9 818	4 529	606
1880	9 310	4 741	610
1885	9 343	4 555	558
1890	8 780	4 428	573
1895	8 959	4 222	542
1900	11 376	5 222	500
1905	12 105	4 460	477
1910	13 055	4 631	464
1915	13 684	4 740	464
1920	13 471	5 295	453
1925	14 781	5 653	394
		6 441	423

	Northborough	Northbridge	North Brookfield
1765	-	-	-
1776	562	481	-
1790	619	569	-
1800	698	544	-
1810	794	713	-
1820	1 018	905	1 095
1830	992	1 053	1 241
1840	1 248	1 449	1 485
1850	1 535	2 230	1 939
1855	1 602	2 104	2 349
1860	1 565	2 633	2 760
1865	1 623	2 642	2 514
1870	1 504	3 744	3 343
1875	1 398	4 030	3 749
1880	1 676	4 053	4 459
1885	1 853	3 786	4 201
1890	1 952	4 603	3 871
1895	1 940	5 286	4 635
1900	2 164	7 036	4 587
1905	1 947	7 400	2 617
1910	1 713	8 807	3 075
1915	1 797	9 254	2 947
1920	1 753	10 174	2 610
1925	1 968	10 051	3 046
	Oakham	Oxford	Paxton
1765	270	890	558
1776	598	1 112	558
1790	772	1 000	582
1800	801	1 237	619
1810	848	1 277	613
1820	986	1 562	597
1830	1 010	2 034	670
1840	1 038	1 742	820
1850	1 137	2 380	792
1855	1 062	2 808	725
1860	959	3 034	626
1865	925	2 713	646
1870	860	2 669	600
1875	873	2 938	592
1880	869	2 604	561
1885	749	2 355	445
1890	738	2 616	426
1895	605	2 390	459
1900	588	2 677	444
1905	519	2 927	416
1910	552	3 361	471
1915	527	3 476	489
1920	477	3 820	591
1925	525	4 026	

	Petersham	Phillipston	Princeton
1765	707	-	284
1776	1 235	-	701
1790	1 560	740	1 016
1800	1 794	802	1 021
1810	1 490	839	1 062
1820	1 623	916	1 261
1830	1 696	932	1 346
1840	1 775	919	1 347
1850	1 527	809	1 318
1855	1 553	799	1 317
1860	1 465	764	1 201
1865	1 428	725	1 239
1870	1 335	693	1 279
1875	1 203	666	1 063
1880	1 109	621	1 100
1885	1 032	530	1 038
1890	1 050	502	982
1895	952	460	952
1900	853	441	975
1905	855	442	907
1910	757	426	818
1915	727	390	800
1920	642	354	682
1925	672	384	773

	Royalston	Rutland	Shrewsbury
1765	617	1 090	1 401
1776	617	1 006	1 475
1790	1 130	1 072	963
1800	1 243	1 202	1 048
1810	1 415	1 231	1 210
1820	1 424	1 262	1 458
1830	1 493	1 276	1 386
1840	1 667	1 260	1 481
1850	1 546	1 223	1 596
1855	1 469	1 102	1 636
1860	1 486	1 076	1 558
1865	1 441	1 011	1 570
1870	1 354	1 024	1 610
1875	1 260	1 030	1 524
1880	1 192	1 059	1 500
1885	1 153	963	1 450
1890	1 030	980	1 449
1895	890	978	1 524
1900	958	1 334	1 626
1905	903	1 713	1 866
1910	792	1 743	1 946
1915	862	1 895	2 794
1920	819	1 743	3 708
1925	821	2 236	5 819

	Southborough	Southbridge	Spencer
1765	731	-	664
1776	753	-	1 042
1790	837	-	1 322
1800	871	-	1 432
1810	926	-	1 453
1820	1 030	1 066	1 548
1830	1 080	1 444	1 618
1840	1 145	2 031	1 604
1850	1 347	2 824	2 244
1855	1 602	3 429	2 527
1860	1 854	3 575	2 777
1865	1 750	4 131	3 024
1870	2 135	5 208	3 952
1875	1 986	5 740	5 451
1880	2 142	6 464	7 466
1885	2 100	6 500	8 247
1890	2 114	7 655	8 747
1895	2 223	8 250	7 614
1900	1 921	10 025	7 627
1905	1 931	11 000	7 121
1910	1 745	12 592	6 740
1915	1 898	14 217	5 994
1920	1 838	14 245	5 930
1925	2 053	15 489	6 523
	Sterling	Sturbridge	Sutton
1765	-	896	2 138
1776	-	1 374	2 644
1790	1 428	1 704	2 642
1800	1 614	1 846	2 513
1810	1 472	1 927	2 660
1820	1 710	1 633	2 056
1830	1 794	1 688	2 186
1840	1 647	2 005	2 370
1850	1 805	2 119	2 595
1855	1 838	2 188	2 718
1860	1 881	2 291	2 676
1865	1 668	2 993	2 363
1870	1 670	2 101	2 699
1875	1 569	2 213	3 051
1880	1 414	2 062	3 105
1885	1 331	1 980	3 101
1890	1 244	2 074	3 180
1895	1 218	2 910	3 420
1900	1 420	2 058	3 328
1905	1 315	1 974	3 173
1910	1 359	1 957	3 078
1915	1 403	1 618	2 829
1920	1 305	1 573	2 578
1925	1 516	1 845	2 174

	Templeton	Upton	Uxbridge
1765	348	614	1 213
1776	1 016	702	1 110
1790	950	833	1 308
1800	1 068	854	1 404
1810	1 205	995	1 404
1820	1 331	1 088	1 551
1830	1 552	1 167	2 086
1840	1 776	1 466	2 004
1850	2 173	2 023	2 457
1855	2 618	2 035	3 068
1860	2 816	1 986	3 133
1865	2 390	2 018	2 838
1870	2 802	1 989	3 058
1875	2 764	2 125	3 029
1880	2 789	2 023	3 111
1885	2 627	2 265	2 948
1890	2 999	1 878	3 408
1895	2 915	2 150	3 546
1900	3 489	1 937	3 599
1905	3 783	2 024	3 881
1910	3 756	2 071	4 671
1915	4 081	2 036	4 921
1920	4 019	1 693	5 384
1925	4 368	1 988	6 172
	Warren	Webster	Westborough
1765	583	-	1 110
1776	827	-	900
1790	899	-	934
1800	979	-	922
1810	1 014	-	1 048
1820	1 112	-	1 326
1830	1 189	-	1 438
1840	1 290	1 403	1 658
1850	1 777	2 371	2 371
1855	1 793	2 727	3 014
1860	2 107	2 912	2 913
1865	2 180	3 608	3 141
1870	2 625	4 763	3 601
1875	3 260	5 064	5 141
1880	3 889	5 696	5 214
1885	4 032	6 220	4 880
1890	4 681	7 031	5 195
1895	4 430	7 799	5 235
1900	4 417	8 804	5 400
1905	4 300	10 018	5 378
1910	4 188	11 509	5 446
1915	4 268	12 565	5 925
1920	3 467	13 258	5 789
1925	3 950	13 389	6 348

West Boylston

West Brookfield

1765	-	-
1776	-	-
1790	-	-
1800	-	-
1810	632	-
1820	886	-
1830	1 055	-
1840	1 187	-
1850	1 749	1 344
1855	2 310	1 364
1860	2 509	1 548
1865	2 294	1 549
1870	2 862	1 842
1875	2 902	1 903
1880	2 994	1 917
1885	2 927	1 747
1890	3 019	1 592
1895	2 968	1 467
1900	2 314	1 448
1905	1 571	1 384
1910	1 270	1 327
1915	1 318	1 288
1920	1 624	1 281
1925	1 916	1 314

Westminster

Winchendon

-	468	519
1765		519
1776	1 145	946
1790	1 176	1 092
1800	1 369	1 173
1810	1 419	1 263
1820	1 634	1 463
1830	1 696	1 754
1840	1 645	2 445
1850	1 914	2 747
1855	1 979	2 624
1860	1 840	2 801
1865	1 639	3 398
1870	1 770	3 762
1875	1 712	3 722
1880	1 652	3 872
1885	1 556	4 390
1890	1 688	4 490
1895	1 315	5 001
1900	1 327	5 933
1905	1 348	5 678
1910	1 353	5 908
1915	1 594	5 904
1920	1 343	6 173
1925	1 884	

Worcester

1765	1 478
1776	1 925
1790	2 095
1800	2 411
1810	2 577
1820	2 962
1830	4 173
1840	7 497
1850	17 049
1855	22 286
1860	24 960
1865	30 055
1870	41 105
1875	49 317
1880	58 291
1885	68 389
1890	84 655
1895	98 767
1900	118 421
1905	128 135
1910	145 986
1915	162 697
1920	179 754
1925	190 757

County of Worcester

	1765	32	827
	1776	46	437
	1790	56	807
	1800	61	192
	1810	64	910
	1820	73	625
	1830	84	355
	1840	95	313
	1850	130	789
	1855	149	516
	1860	159	659
	1865	162	912
	1870	192	716
	1875	210	295
	1880	226	897
	1885	244	039
	1890	280	787
	1895	306	445
	1900	346	958
	1905	362	668
	1910	399	657
	1915	430	703
	1920	455	135
	1925	489	697

TABLE V.

DENSITY OF POPULATION PER SQUARE KILOMETER.

names of towns	1790	1830	1860	1895	1925
Ashburnham	9.4	13.9	20.8	21.2	21.3
Athol	11.6	13.4	31.1	87.9	114.7
Auburn (Ward)	11.5	16.8	22.5	39.3	121.0
Barre	14.0	21.8	25.9	19.8	30.0
Berlin	15.5	20.3	32.8	26.6	31.8
Bolton	15.1	22.1	24.5	15.4	15.5
Boylston	13.9	20.0	22.7	17.8	23.7
West Boylston	-	31.9	76.0	90.2	58.2
Brookfield	17.7	19.4	34.5	49.4	36.0
North Brookfield	-	22.6	50.4	84.7	55.7
West Brookfield	-	-	28.8	27.3	24.5
East Brookfield	-	-	-	-	34.4
Charlton	15.8	19.6	18.4	16.9	20.6
Dana	-	13.3	18.4	15.0	13.8
Douglas	11.3	18.1	25.5	21.2	24.7
Dudley	14.0	31.2	31.7	58.6	84.0
Webster	-	-	89.8	240.7	413.1
Fitchburg	16.0	130.7	109.5	370.4	611.5
Gardner	8.7	16.8	46.4	161.1	328.3
Grafton	15.9	33.1	73.0	86.3	117.9
Hardwick	15.3	18.5	14.8	25.9	29.7
Harvard	20.2	23.5	22.0	17.0	14.5

	1790	1830	1860	1895	1925
Holden	10.5	18.3	21.1	28.3	37.3
Hubbardston	8.7	16.0	15.5	12.2	10.2
Lancaster	16.8	23.4	26.9	30.4	37.3
Clinton	-	-	275.6	821.2	1012.9
Leicester	18.3	30.2	46.7	55.0	69.8
Leominster	17.9	27.8	47.2	123.3	295.0
Lunenburg	18.5	19.1	17.6	17.9	27.2
Mendon	17.9	36.2	29.4	19.4	22.4
Blackstone	-	-	133.0	147.3	177.8
Millville	-	-	-	-	172.8
Milford	16.9	27.2	17.7	233.3	385.1
Hopedale	-	-	-	104.3	239.4
New Braintree	17.4	15.3	14.9	10.1	7.8
Northboro	12.8	20.7	32.6	40.4	41.0
Northbridge	13.2	21.1	58.7	117.7	224.1
Oakham	14.2	18.7	17.6	11.1	9.6
Oxford	15.1	22.5	43.8	34.5	58.2
Paxton	17.2	17.6	18.8	11.0	15.3
Petersham	13.2	17.0	14.7	9.5	6.7
Phillipston (Gerry)	11.6	15.0	12.4	7.5	6.2
Princeton	11.9	15.5	13.1	10.4	8.4
Royalston	10.1	13.7	13.8	8.2	7.5
Rutland	11.3	13.4	11.7	10.7	24.4

	1790	1830	1860	1895	1925
Shrewsbury	17.8	25.7	28.9	28.3	107.9
Southborough	23.2	30.0	51.8	62.1	57.4
Southbridge	-	27.8	67.6	155.9	292.8
Spencer	15.4	18.8	32.4	88.7	76.0
Sterling	16.2	22.6	23.8	15.4	23.8
Sturbridge	13.5	17.4	23.6	19.7	19.0
Sutton	19.9	25.1	31.8	40.6	25.8
Millbury	-	39.3	80.4	127.4	157.2
Templeton	11.6	18.9	34.3	35.7	53.5
Upton	14.9	20.8	35.5	38.4	35.5
Uxbridge	18.2	29.0	41.2	46.7	81.2
Warren (Western)	12.7	16.7	29.5	62.1	55.4
Westboro	17.0	26.1	53.2	95.7	110.5
Westminster	13.5	19.0	19.9	14.2	20.4
Winchendon	8.6	13.3	23.8	40.7	56.0
Worcester	21.8	43.2	258.8	1028.8	1977.6

TABLE VI.

PERCENTAGE OF PEOPLE EMPLOYED IN NON-AGRICULTURAL
OCCUPATIONS, OF TOTAL NUMBER OF PEOPLE ENGAGED IN
GAINFUL OCCUPATIONS.

names of towns	1820	1840	1865	1885	1915
Ashburnham	21.3	35.0	76.8	75.2	81.7
Athol	29.0	31.1	79.0	89.6	97.1
Auburn (Ward)	20.0	13.8	26.4	61.9	83.3
Barre	20.4	26.3	36.9	51.1	85.0
Berlin	14.7	20.6	8.6	48.1	55.0
Bolton	22.8	23.0	6.3	28.3	38.2
Boylston	29.1	7.8	21.2	36.3	69.4
West Boylston	27.5	33.0	71.9	82.9	67.4
Brookfield	32.6	23.2	82.7	88.1	79.2
North Brookfield	28.0	46.5	78.7	85.7	84.7
West Brookfield	-	-	-	72.6	71.6
Charlton	23.2	14.0	20.1	45.2	67.0
Dana	16.6	23.9	38.3	50.8	78.1
Douglas	19.1	42.1	?	76.1	83.3
Dudley	34.2	40.0	79.5	79.4	91.4
Webster	-	70.7	93.2	95.5	97.7
Fitchburg	19.7	54.3	93.7	94.4	97.8
Gardner	25.0	45.5	90.2	93.3	96.0
Grafton	41.9	71.7	74.1	82.8	87.9
Hardwick	22.9	12.8	48.4	74.7	84.3

names of towns	1820	1840	1865	1885	1915
Harvard	16.3	23.4	14.6	26.4	49.2
Holden	34.3	14.9	44.3	70.1	77.9
Hubbardston	19.7	31.9	38.0	48.3	54.9
Lancaster	27.4	39.8	23.8	58.5	76.7
Clinton	-	-	95.8	97.7	98.5
Leicester	46.9	45.9	71.3	75.9	86.9
Leominster	22.3	46.7	62.8	84.8	96.5
Lunenburg	24.4	16.7	10.1	37.4	63.6
Mendon	33.8	61.3	33.9	43.3	67.6
Blackstone	-	-	90.6	92.3	93.0
Millville	-	-	-	-	-
Milford	31.8	58.7	94.6	93.3	96.3
Hopedale	-	-	-	-	96.5
New Braintree	21.3	13.0	4.3	57.7	93.2
Northborough	33.2	36.0	37.5	68.7	71.9
Northbridge	39.5	61.2	85.9	85.9	95.9
Oakham	22.5	24.8	14.1	37.3	40.5
Oxford	17.2	41.0	66.9	74.3	86.2
Paxton	33.3	33.0	?	38.9	38.2
Petersham	28.4	26.4	5.2	27.6	42.9
Phillipston (Gerry)	17.7	49.4	11.3	34.4	38.1
Princeton	13.1	23.3	14.9	39.0	56.2
Royalston	20.0	28.8	25.9	46.8	63.2

names of towns	1820	1840	1865	1885	1915
Rutland	12.2	24.4	?	29.9	73.5
Shrewsbury	36.3	34.9	34.0	39.2	74.3
Southborough	20.7	19.0	46.1	63.2	74.3
Southbridge	50.0	69.0	90.6	91.9	97.7
Spencer	28.0	30.3	76.2	91.2	90.1
Sterling	41.1	32.6	19.1	37.8	49.6
Sturbridge	26.2	33.4	61.4	69.4	73.6
Sutton	22.2	46.2	62.3	84.8	76.6
Millbury	33.5	61.5	86.9	89.9	92.9
Templeton	22.9	49.3	82.9	77.3	77.0
Upton	33.1	47.8	89.5	86.9	84.1
Uxbridge	19.8	37.7	74.4	74.2	90.1
Warren (Western)	27.8	21.4	63.7	84.9	91.3
Westborough	21.3	38.4	80.9	81.9	89.2
Westminster	24.5	25.8	32.4	58.0	64.4
Winchendon	15.9	40.9	64.6	86.8	93.6
Worcester	36.0	49.2	94.8	96.7	98.9

TABLE VII.

PERCENTAGE OF FOREIGN-BORN PEOPLE

names of towns	1830	1855	1885	1915
Ashburnham	-	8.8	14.5	19.0
Athol	-	8.4	10.9	19.9
Auburn (Ward)	-	20.0	27.0	26.2
Barre	0.2	10.8	10.7	37.5
Berlin	-	7.8	7.4	10.2
Bolton	0.4	8.5	12.0	15.2
Boylston	-	11.4	19.4	21.2
West Boylston	-	21.4	30.6	21.9
Brookfield	0.25	13.4	18.0	15.9
North Brookfield	-	11.9	22.2	23.0
West Brookfield	-	12.5	12.3	11.0
Charlton	0.14	7.1	9.3	17.3
Dana	-	0.22	5.2	13.6
Douglas	0.5	15.5	18.6	33.0
Dudley	6.84	22.4	36.8	34.8
Webster	-	21.4	41.8	33.2
Fitchburg	-	18.6	45.3	35.0
Gardner	-	10.3	27.0	35.5
Grafton	1.7	24.8	26.9	32.1
Hardwick	0.05	7.4	38.0	43.7
Harvard	0.12	8.4	11.3	18.1
Holden	-	17.3	24.3	22.6
Hubbardston	-	2.0	10.1	14.9

	1830	1855	1885	1915
Lancaster	-	14.4	21.2	17.9
Clinton	-	38.6	38.0	35.8
Leicester	3.5	28.3	26.0	20.7
Leominster	-	7.1	12.0	25.9
Lunenburg	-	6.4	6.5	14.7
Mendon	0.35	11.8	7.8	16.0
Blackstone	-	45.3	35.4	29.5
Millville	-	-	-	-
Milford	0.6	37.2	21.9	30.8
Hopedale	-	-	-	20.7
New Braintree	-	1.0	18.6	25.2
Northboro	-	16.0	19.9	16.3
Northbridge	1.0	19.4	35.3	39.0
Oakham	0.33	3.5	10.3	12.1
Oxford	1.0	18.3	18.1	21.5
Faxton	0.17	9.0	13.0	20.6
Petersham	0.06	4.0	5.8	10.0
Phillipston (Gerry)	-	6.6	6.2	6.9
Princeton	-	3.9	10.0	19.0
Royalston	-	4.4	8.5	18.3
Rutland	-	5.5	10.0	29.1
Shrewsbury	-	7.4	11.8	21.0
Southboro	0.1	17.4	21.0	25.7

	1830	1855	1885	1915
Southbridge	1.57	34.0	35.9	34.7
Spencer	0.17	22.0	28.1	17.8
Sterling	-	7.3	11.0	22.3
Sturbridge	0.6	9.4	23.3	14.4
Sutton	0.5	17.6	30.4	29.3
Millbury	1.8	30.7	30.1	24.5
Templeton	-	14.3	12.7	20.3
Upton	-	11.5	12.1	12.2
Uxbridge	0.14	25.2	20.8	26.4
Warren (Western)	0.17	11.6	28.3	31.6
Westboro	-	17.7	16.0	21.9
Westminster	-	9.3	8.6	19.1
Winchendon	-	12.9	18.9	23.1
Worcester	0.7	25.3	29.5	32.3

TABLE VIII.

PERCENTAGE OF PEOPLE OF SOUTHERN AND EASTERN EUROPEAN STOCK, ACCORDING TO THE STATE CENSUS OF 1915.

Athol	16.0%	Templeton	16.3%
Auburn	3.7	Uxbridge	10.9
Barre	31.5	Warren	28.0
Blackstone	10.7	Webster	31.0
Clinton	12.3	Westborough	6.1
Dudley	28.3	Winchendon	9.9
Fitchburg	21.5	Worcester	19.5
Gardner	30.0	Ashburnham	13.0
Grafton	8.8	Berlin	3.5
Hardwick	33.3	Bolton	3.6
Holden	11.3	Boylston	6.0
Hopedale	10.0	Brookfield	6.6
Lancaster	2.1	Charlton	10.0
Leicester	4.3	Dana	3.5
Leominster	8.7	Douglas	10.8
Milford	35.7	Harvard	3.3
Millbury	5.9	Hubbardston	12.9
Northbridge	11.5	Lunenburg	7.6
North Brookfield	5.6	Mendon	3.7
Oxford	5.9	New Braintree	13.3
Shrewsbury	10.	Northborough	4.7
Southbridge	15.4	Oakham	3.6
Spencer	2.8	Paxton	15.0
Sutton	10.6	Petersham	0.3

Phillipston	4.9%	Sturbridge	3.1
Princeton	12.1	Upton	2.0
Rutland	19.3	West Brookfield	3.2
Boylston	16.6	West Boylston	21.7
Southborough	14.2	Westminster	10.2
Sterling	13.4		

Considered as southern and eastern European stock are people born in Portugal, Italy, Greece, Turkey, Poland and Russia and those native-born persons, whose parents were both born in one of these countries.

TABLE IX.

PERCENTAGE OF LAND IN USE FOR AGRICULTURAL PURPOSES.

	1791	1831	1851	1855	1916
Ashburnham	12.3	33.0	48.6	52.2	24.
Athol	24.5	33.3	48.4	54.2	19.
Auburn (Ward)	25.0	50.6	52.5	44.3	46.
Barre	29.5	48.5	70.9	64.6	47.
Berlin	25.2	59.1	63.5	59.6	49.
Bolton	24.4	51.6	53.1	57.6	48.
Boylston	23.4	49.6	62.5	62.1	27.
West Boylston	-	59.5	68.6	56.0	56.
Brookfield	26.8	58.4	50.5	51.3	26.
North Brookfield	-	-	68.8	67.5	58.
West Brookfield	-	-	66.0	72.9	49.
Charlton	25.2	64.9	69.3	59.4	46.
Dana	-	31.3	34.5	46.1	30.
Douglas	15.0	19.6	25.0	23.2	8.
Dudley	21.9	66.3	69.9	62.5	57.
Webster	-	-	48.0	32.8	20.
Fitchburg	18.1	39.5	60.5	54.1	34.
Gardner	12.6	38.9	57.4	46.0	27.
Grafton	37.9	66.5	65.1	66.2	62.
Hardwick	21.0	28.8	38.2	59.8	45.
Harvard	32.3	54.3	62.6	67.6	42.
Holden	17.4	42.3	58.8	48.4	32.

	1791	1831	1851	1855	1916
Hubbardston	13.8	37.7	51.3	56.3	22.
Lancaster	23.9	51.5	51.9	40.8	35.
Clinton	-	-	37.0	32.8	16.
Leicester	36.9	54.0	47.4	42.3	25.
Leominster	23.9	54.6	59.5	48.7	44.
Lunenburg	16.8	62.4	65.2	52.9	33.
Mendon	31.0	38.0	58.1	45.3	34.
Blackstone	-	-	45.4	37.3	34.
Millville	-	-	-	-	-
Milford	43.4	48.7	73.9	43.7	34.
Hopedale	-	-	-	-	33.
New Braintree	30.2	45.8	65.9	72.4	64.
Northborough	29.4	-	56.9	60.0	46.
Northbridge	? 9.6	29.6	37.7	27.1	31.
Oakham	14.0	53.6	60.6	50.0	35.
Oxford	27.4	54.6	62.6	42.8	33.
Paxton	38.1	63.1	52.7	60.1	42.
Petersham	17.5	59.4	61.4	69.0	26.
Phillipston(Gerry)	27.3	63.4	68.9	70.4	35.
Princeton	31.0	48.7	73.4	59.2	34.
Royalston	11.2	40.4	57.9	47.2	24.
Rutland	28.8	39.5	46.5	61.7	38.
Shrewsbury	29.3	56.9	67.5	59.4	46.

	1791	1831	1850	1885	1916
Southborough	51.8	73.4	85.7	88.6	50.
Southbridge	-	68.2	69.0	46.5	31.
Spencer	29.1	58.4	63.3	58.0	54.
Sterling	26.5	50.1	60.0	65.9	48.
Sturbridge	20.2	53.0	53.6	41.7	31.
Sutton	35.4	46.5	49.2	40.4	39.
Millbury	-	48.4	59.8	54.1	48.
Templeton	20.9	49.2	49.5	41.6	35.
Upton	26.8	32.2	36.5	41.2	33.
Uxbridge	40.4	49.7	54.2	44.0	30.
Warren (Western)	23.4	45.7	55.1	64.8	61.
Westborough	41.8	59.8	62.8	66.5	51.
Westminster	17.6	31.7	54.7	46.1	32.
Winchendon	14.4	22.8	51.2	39.0	25.
Worcester	34.5	79.9	-	57.5	46.