

ECOLOGICAL STUDIES

of

Rochester, New York

done under the
research directorship

of

C. LUTHER FRY

prepared for publication

by

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TABLE OF CONTENTS

	Page
Introduction	i
Chapter 1 - Methodology of the Maps	1
Chapter 2 - Tabular Data for the Maps	13
Table I Area in Acres and Population by Color and Nativity, 1930: by Census Tracts, Rochester, New York.	15
Table II Number of Families and Population by Sex and Age Groups, 1930; and Total Number of Births and Deaths, 1933-1935: by Census Tracts, Rochester, New York.	17
Table III Selected Population Ratios: Foreign Born, Size of Family, Density and Age Groups for 1930; Birth and Death Ratios for 1933-1935: by Census Tracts, Rochester, New York.	19
Table IV Total Cases Registered in Selected Social Agencies for Various Periods of Time between 1928 and 1938: Given in Numbers and Ratios by Census Tracts, Rochester, New York.	21
Table V Rank Order of Ratios for the Selected Social Indices of Maps II to XI, and the Rank Order of Their Sums (Map I); Given by Census Tracts.	23
Table VI Color Rankings of the Ten Social Indices of Maps II to XI and the Composite Index of Map I, by Census Tracts.	25
Table VII Total Rank Order Scores Underlying Map I, Given in Order of Size from Lowest to Highest.	27
Chapter 3 - Manual for Interpreting the Maps	28
Chapter 4 - Ecological Maps	52
Map I Composite of Ten Social Indices, Rochester, New York 1928-1938.	
Map II Families on Public Relief, November 1 - 15, 1936.	
Map III Juvenile Delinquency - Adjudicated Cases - Boys, 1928-1937.	
Map IV Families under Care of Protective Department, S.P.C.C., 1931-1936.	
Map V Boy Scouts - Including Cubs, January 1, 1938.	
Map VI Foreign Born, 1930.	
Map VII Density of Population, 1930.	
Map VIII Size of Families, 1930.	
Map IX Average Birth Rate, 1933-1935.	
Map X Average Crude Death Rate, 1933-1935.	
Map XI New Tuberculosis Cases, 1934-1937.	

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INTRODUCTION

The research studies in this publication constitute an attempt to depict segments of the life of the Rochester community in terms of their spatial distribution or ecology. The history of every field of research is a record of gains made in extracting verifiable knowledge from every-day experience and in discovering new facts which underlie but are not known to such experience. It is apparent, for example, that large cities include within their borders families of various sizes and persons of differing age, nativity, color, religion, economic status, police record, etc. If, however, one should wish specific information concerning the comparative incidence of any one of these social factors for various areas of the city, or the relationship of one factor to another in any specific area; in other words, if one should desire more detailed knowledge of the social topography of a large city for some scientific or civic enterprise, our every-day experience is inadequate. To effect some such needed refinement of experience, and perhaps uncover as yet unknown relations between known social factors, the ecological method has proved useful.

In addition to the eleven ecological maps there is included a rather complete chapter on their methodology, a chapter of tables containing the data underlying the maps and other data useful for interpreting the maps, and a chapter suggesting the kind of interpretations that can be made. The reader is urged to study this material carefully as the prerequisite to an understanding of the maps themselves.

No reliable interpretation of any single map can be made without a thorough knowledge of Chapter 1, and the ability to utilize Chapter 2.

It must constantly be kept in mind that the tables and methods are the basic content of the studies here reported. The maps simply give us a five color bird's eye view of the spatial patterning involved.

Acknowledgment is here made to the following persons for their cooperation in permitting the collection of the basic data for Maps II to XI: The Honorable Henry D. Shedd, Judge of the Monroe County Children's Court; Dr. Paul A. Lembke, District Health Officer of the State Department of Health; Division of Tuberculosis; Dr. A. M. Johnson and Mr. Henry A. Lieberwurst of the Rochester Health Bureau; Mr. Frank X. Kelly, then Commissioner of the Rochester Department of Public Welfare, and Miss Sara James, General Case Supervisor of the Rochester Department of Public Welfare; Mr. Guy D. Harris, Director of the Protective Department of the Rochester Society for the Prevention of Cruelty to Children; and Mr. W. Arthur McKinney, Executive of the Rochester Council, Boy Scouts of America.

Acknowledgment is made to the following persons for their research assistance: Miss Ruth Wilner and Miss Anne Johanson, who have been personally responsible for much of the work of compiling tables and preparing maps for publication; Mrs. Mary Louise Pearse and Miss Zoe Gray for the Juvenile Delinquency and Tuberculosis maps respectively; Miss Helen Martin and Miss Sally Bascom for the S.P.C.C. map; Miss Shirley Cohn and Miss Marie McWilliams for the Public Relief map; Mr. Gordon E. Mestler for the Density map; and the following persons for the Birth and Death Rate maps: the Misses Joann Guggenheimer,

Dorothy Kleinberg, and Ferne Paull; and the Messrs. Darwin Erdle, William Form, Carl Kujawski, Reed McBane, Elmer Myers, and Everett Perry.

To Mr. Oscar W. Kuolt, General Secretary of the Rochester Council of Social Agencies, we owe a singular debt of gratitude. His advice, encouragement, and concrete assistance in undertaking the mimeographing of the textual materials have been invaluable. To Miss Isabelle Howard, Secretary, Research Department, Council of Social Agencies, and to Mr. W. Earl Weller, Director of the Rochester Bureau of Municipal Research, Inc., we express appreciation for being permitted to share in their knowledge of the city.

Professor Fry saw these studies through to the publication stage. At his death in April, Maps II to XI, their tabular data, and some of their specific methodology in Chapter 1 had been completed. The present writer undertook the odds and ends that were left. These included Map I and its tables, the writing of Chapters 1 and 3, and a revision of Chapter 2. He is solely responsible for any errors and inadequacies that may be present in these parts of the work.

Rochester, New York

Raymond V. Bowers

September, 1938.

Chapter 1

Methodology of the Maps

A. General Method

The ecological method, as used in Sociology, is simply a refined means of (a) describing graphically the spatial distribution of segments of the social life of a community, and (b) attempting to account for any such distribution by comparing it with other distributions assumed to have explanatory relevance.

The (b) phase of the method is accomplished by procedures ranging from simple perception to correlation techniques, examples of which will be found in Chapter 3. The (a) phase of the method involved five distinguishable steps:--

(1) The division of the community into small, socially homogeneous, spatial units, known as Census Tracts.

This has two advantages. First, it enables the researcher to draw conclusions which are fairly representative of an area as a whole, rather than conclusions which would in fact be true only of one part of the area, as would be likely if wards were used. Second, it provides areas of sociological significance for the United States Bureau of the Census, so that basic population data can be obtained for units that have social relevance.¹

1. "The Census Tract movement originated more than thirty years ago in New York City. At that time Dr. Walter Laidlaw, who was working with population statistics in New York City, found that adequate study of neighborhoods required population data for local areas smaller than boroughs or wards and that these areas must remain unchanged from census to census.

"The value of the census tract division lies in the easily handled size of a unit, homogeneous as concerns both area and population. These materials make possible thorough sociological analysis of urban populations not possible heretofore under the system of ward tabulation. Census figures by tracts have been used directly and indirectly by city depart-

(2) The construction of a map of the community divided into these Census Tract areas. This had already been done when the present studies were undertaken.

(3) The collection of social data and their classification by Census Tracts. The maps based wholly upon data for 1930 secured from the United States Bureau of the Census (Foreign Born, Density of Population, Size of Families) required no reclassification of data, as these data were available by Census Tracts. With the exception of Map I, all the remaining maps involved data such as delinquency cases of families on relief which had to be reclassified. This was done by looking up the addresses in the University of Rochester Department of Sociology publication, Rochester House Numbers by Census Tracts.¹

(4) The reduction of these classified data to ratios so that the incidence of a social characteristic in one Census Tract may be readily compared with its incidence in other Census Tracts.

In computing ratios there is frequently some choice of base, and the researcher must decide which base is likely to yield the most adequate ratios under the usual limitations of time and money.

ments such as Child Welfare Boards, Juvenile Courts, Recreation Commissions, and Public Welfare Boards; by educational and health organizations both public and private; by Councils of Social Agencies, Associated Charities, and Boy Scouts; by Chambers of Commerce; Federations of Churches, and housing associations; and by commercial concerns such as advertising companies, banks, chain drug and grocery stores, utility companies, insurance companies and newspapers.

"The tract divisions, subsequently approved by the Bureau of Census, divide the city (Rochester) into eighty-eight tracts which, with a few exceptions, are nearly uniform in area and which have populations ranging from a minimum of 1,300 to a maximum of 6,000. As far as was possible tracts were laid out so that populations were homogeneous in race, nationality, and economic status. Tracts are made up of one, or a combination of two or more, of the small enumeration districts which were used during the 1930 census; in no case do tract boundaries cut across ward lines."

Quoted from the Introduction to Rochester House Numbers by Census Tracts, Department of Sociology, University of Rochester, 1936.

1. A revision of this publication is now available.

In the Density of Population map, for example, the most accessible ratios are "number of people per residential acre", since the population and residential acreage of each tract is available, and this is as adequate as any other ratio. In the Birth Rate map, on the other hand, adequacy requires some such refinement as "number of births per 1,000 females between the child-bearing ages of 15 to 44", rather than the more readily computed ratio "number of births per 1,000 population". Hence the research worker must compute the number of females 15 to 44 years of age for each tract before the more satisfactory birth rates can be obtained.

(5) The plotting of these ratios on the Census Tract map according to some system of symbols (colors, cross hatching, etc.).

The problem of plotting the ratios on a map is mainly one of facilitating perception. Plotting the ratios themselves can be done, but such a map is not easily visualized or compared with a map involving another series. In order to secure greater visibility, the ratios are generally grouped into a small number of classes and each class is represented by a color or some cross hatching device. In the following maps five colors are used, which means that the ratios of the eighty-eight Census Tracts are divided into five categories. This was done by listing the eighty-eight ratios in order of size and dividing them in such a way that the middle three classes would have equal intervals, at the same time placing approximately the same number of Census Tracts in each of the five classes. For example, the Birth Rate series (see Map IX) was divided as follows: less than 18, 18 to 21.5, 21.5 to 25, 25 to 28.5, and over 28.5. The three middle

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classes (underlined) have equal intervals, the higher value being 3.5 more than the lower in each case. This division, moreover, placed approximately equal numbers of tracts in each category; 17 Census Tracts in the first class, 15 in the second, 20 in the third, 19 in the fourth, and 17 in the fifth.

The class of Census Tracts containing the highest ratios is represented by the color red in every map except that for Boy Scouts. The remaining colors - orange, yellow, green, blue - represent increasingly smaller ratios. In the Boy Scout map the color sequence is reversed, red representing the lowest ratios and blue the highest. Thus, by and large, red means the "below average" or "inferior" tracts and blue means the "above average" or "superior".¹

B. Specific Source of Data and Variety of Ratio for each Map.²

Map I is presented after Maps II to XI because it is derived from them.

Map II - Families on Public Relief.

The basic data for Map II (column n of Table IV)³ were obtained from the file of active cases of the Department of Public Welfare for the period November 1 to 15, 1936. All cases listed in this file at that time were used, the total number being 6,814.

The ratio used is a simple percentage - the number of relief cases per 100 families. This was obtained by dividing column n of Table IV by column e of Table II, and multiplying the result by 100.

1. We use the words "inferior" and "superior" merely for textual clarity. We do not wish them to imply moral judgment on our part.

2. All population figures used in these studies are those of the 1930 Census.

3. The tables with their lettered columns are found in Chapter 2.

The results are recorded in Table IV. The drawbacks of this ratio are that the two series are not entirely comparable either for time or composition. The "total family" series (column e) is for 1930 and is the number of census families in each tract. The "relief" series (column n) is for 1936 and is the number of relief cases. What changes the mobility of the population between 1930 and 1936 has made in the number of families by Census Tracts is unknown. As to composition, the two series (census families and relief cases) are probably fairly similar, but this is simply a common-sense estimate. Such drawbacks are, however, unavoidable. The census is taken only every ten years, and every agency claims the right to determine what, for its purposes, is the best definition of a "family", a "case", etc. The ratio we have used is the best obtainable at the present time.

Map III - Male Juvenile Delinquency.

The basic data for Map III (column p of Table IV) were obtained from the records of the Children's Court of Monroe County. The cases selected for study were those of all first offenders under 16 years of age who had been officially adjudicated delinquent¹ in this court during the years 1928-1937.

There were 1,005 cases of boys and 184 of girls, making a total of 1,189 cases. Due to the small number of girls involved, Map III has been restricted to the delinquency among boys. The ratio used is a simple percentage - the number of delinquents per 100 boys. This was obtained by dividing the number of boy delinquents in each tract

1. Committed to an institution or to an agency for placement, or placed on probation.

by the total number of boys between the ages of 5 and 14 in the population of that tract and multiplying the result by 100. Since the figures for the boy population for this period were not available, we used one-half the child population of the five to fourteen age group (column g of Table ~~III~~^{II}) as a close approximation. The results are recorded in Table IV.

The ratios obtained must be used with care. What we have done is to determine the number of delinquents for a ten year period (1928-1937) per 100 boys at one particular time (when the census was taken in 1930). The ratios are, therefore, not annual delinquency rates, nor are they ten-year delinquency rates. This point will be made more concrete if we take an example. Census Tract 1 has a delinquency ratio of 33%, obtained by dividing the 10 boy delinquents between 1928 and 1937 by the 1930 population of 30 boys between 5 and 14 years of age (see Tables II and IV). Let us assume that this tract had 30 boys every year from 1928 to 1937, and that these boys were distributed equally among the ages (3 boys 5 years old, 3 boys 6 years old, etc.). Since boys grow older each year it is easily seen that Census Tract 1 will have had 60 different boys, 5 to 14 years of age, in this ten year period.¹ Thus we find that 10 boys out of 60 rather than 10 out of 30 would give a more accurate 10 year rate (16.7%), and the average annual rate would be 1/10 of this, or 1.67%. This does not invalidate the ratios in Table IV as we are interested primarily in a ratio which will give adequate comparative values for each tract, and ours does. Moreover our ratio is the only one possible because of the small number of delinquents each year and the absence of an annual

1. The normal mobility of the population would probably increase this number.

census of the population. We mention these points, however, simply to warn the reader in his interpretation of the ratios. Census Tract 1 does not have an annual delinquency rate of 33%. It does have a comparative delinquency ratio of 33%.

Map IV - Families under Care of Protective Department, S.P.C.C.

The basic data for Map IV (column r of Table IV) were obtained from the address file of the Society for the Prevention of Cruelty to Children for the period 1931-1936. When several families had resided at the same address during the period, each was counted as a separate case. If a case had been closed but reopened during the five-year period at a new address, each address was again counted as a separate case. When the case had remained open but the family's address changed, only the original address was used. (Thus when the agency had attempted to aid a family's adjustment by improving the environment and moving the family to a new residential section, that section's percentage of cases was not increased accordingly.)

The total number of cases recorded within the five-year period was 2,871. The ratio used was the same as that for Map II (the number of cases per 100 families), and the analysis we offered for such a ratio (see Page 5) applies equally here. Likewise, our analysis of the use of data covering a period of years, as given on Page 6, applies equally here. The ratios for Map IV are found in Table IV.

Map V - Boy Scouts.

The basic data for Map V (columns of Table IV) were made available by the Rochester Council, Boy Scouts of America. They include those Scouts and Cubs whose memberships were active on January 1, 1938. Although the Cub group, nine to eleven year old boys, is not included in actual Scout membership, this study has included it in order to secure a larger total.

The ratio used is the percentage of boys in each tract that were Scouts. The boy population was taken as one-half the number of persons under fifteen years of age in the 1930 Census (columns f and g of Table II). This group would be from eight to twenty-two years of age in 1938, and would thus conform roughly to the Scout age group. By dividing the total number of Scouts in each tract by the total boy population in that tract, as thus derived, and multiplying the result by 100, the percentages were obtained. The results are recorded in Table IV.

Map VI - Foreign Born.

The basic data for Map VI (column d of Table I) were secured from the United States Bureau of the Census. The ratio used is the percentage of the total "white" population of each Census Tract that was classified as foreign born (column d divided by column b, and the result multiplied by 100). The results are recorded in Table III.

Map VII - Density of Population.

The ratio used in determining the density of population for each tract was the number of persons per acre of residential area

(column c divided by column a of Table I). To secure residential area it was necessary to subtract acreage devoted to cemeteries, parks, railroad yards, etc. from the total area. The ratios, by tracts, are given in Table III.

Map VIII - Size of Families.

The average size of families in each Census Tract was determined by dividing the total population of each tract by the total number of families in each tract (column c of Table I by column e of Table II).

Although this is as close an approximation to family size as can be secured at present, it must be remembered that this ratio is the average size of families as defined by the Bureau of the Census. It is not the average size "father, mother, children" family. A striking example of the difference is found for Census Tract 1. It has the tenth lowest birth rate of the 88 tracts and the highest average size of family (see Table V). This does not make sense until one realizes that "census families" include rooming houses, etc. Thus an area might have large census families and a low birth rate. That this is the case for Census Tract 1 is likely because it has 997 males and only 366 females (see Table II). The "size of family" ratios are recorded in Table III.

Map IX - Average Birth Rate.

The basic data for Map IX (column 1 of Table II) included all births to legal residents of Rochester that were recorded at the Health Bureau for the three-year period 1933 to 1935, with the excep-

tion of still-births and births occurring in the Community Home for Girls at 293 Troup Street. As a base for the ratios we used the number of females between the child-bearing ages of fifteen and forty-four. This was obtained by taking one-half the total population for this age period (column h of Table II). The ratio is the average annual number of births per 1,000 females 15 to 44 years of age ($\frac{1}{3}$ column l divided by $\frac{1}{2}$ column h, the result multiplied by 1,000). This is a standard refined birth rate. The results are to be found in Table III.

Map X - Average Crude Death Rate.

The basic data for Map X (column m of Table II) were secured from the death certificates of legal residents who died during 1933, 1934, and 1935. Residents of homes for the aged, and still-births, were excluded.

The average death rate for each tract was determined by dividing one-third the total number of deaths in each tract for the three years by the total population of that tract and multiplying the result by 1,000 ($\frac{1}{3}$ column m divided by column c, the result multiplied by 1,000). This is a crude death rate and must be used with caution.¹ The ratios for Map X are found in Table III.

Map XI.- New Tuberculosis Cases.

The basic data for Map XI (column t of Table IV) are based on information contained in the monthly reports sent from the State Department of Health, Division of Tuberculosis, Albany, New York, to the District Health Officer in Rochester. Each report contains the

1. For further discussion of this ratio, see Chapter 3.

names of all patients reported as having their home address in the area designated, whether the case was reported by a physician of that area or some other area. For this study we have selected all patients for the period January 1934 to December 1937 inclusive, whose home address is listed as being within the city limits of Rochester and for whom no previous report from Rochester is listed. Thirteen of these patients are shown to have been previously reported when living in Monroe County outside of Rochester, and a few others when living in other counties of New York State. The entire group selected numbers 1,273. It was found necessary to exclude seventeen cases because the addresses as given could not be verified, twelve others whose Rochester street addresses were not reported from the institutions in which they were receiving care, and eight who were reported as resident staff members of six hospitals.

The ratio used was a simple percentage, the total number of patients in each tract divided by the total population of the tract, the result multiplied by 100. The results are found in Table IV.

Map I - Composite of Ten Social Indices.

The construction of Map I presents a slightly different problem because it involved neither original data nor ratios. It involves a composite series, comprising the ten individual indices of Maps II to XI. This composite series was obtained by adding the relative ranks of each Census Tract for each of the ten social indices (see Table V). Let us take the "Families on Public Relief" index as an example of what we mean by relative ranking. The 88 Census Tract

ratios for Families on Public Relief were listed in order of size and the tract with the highest ratio (tract 1) was given rank 88. The next highest ratio (tract 43) was given rank 87. The lowest ratio (tract 61) was given rank 1. This procedure was carried out for all the other 9 series. (In the case of the Boy Scout index, the ranking was reversed, the tract with the highest ratio of Boy Scouts being given rank 1 and the tract with the lowest ratio, rank 88.) Thus, by and large, rank 88 means the most below average tract and rank 1 the most above average. The ten rankings for each tract were then added. These totals were listed in order of size (see Table VII) and divided into five classes, each division representing a fairly good break in the distribution. The classes contain 18, 17, 19, 17, and 17 Census Tracts respectively from the lowest total scores (blue) to the highest total scores (red).

The color of each Census Tract in this map is, in effect, an average of the ratings of the other ten maps. In some cases these averages are truly representative of their ten constituent values. For example, the red tract 17 is red for eight of the ten indices and orange for the other two. The blue tract 78 is blue for seven of the ten indices and green for the other three. In many cases, however, there is considerable variation around the "average" color as given in Map I. This makes it dangerous to generalize about any tract of one of the specific maps on the basis of its rating on the composite map. The function of Map I is to give a generalized picture of all the indices, and, as any statistical average, it does not tell anything about the range of its distribution. The range can, however, be found by reading across the rows of Tables V and VI.

Chapter 2

Tabular Material for the Maps

Tables I to VII contain all the data used in the construction of Maps I to XI. Additional material such as sex distribution, which may prove useful in interpreting some of the maps, is also included.

Tables I to IV contain all the primary data and their ratios. Tables I, II, and III are restricted to the various population series, the first two containing the population numbers, the third the population ratios. Table IV is restricted to the data from the five social agencies, including both numbers and ratios.

Tables V, VI, and VII are derived from the preceding four. Table V gives the relative ratio rankings of each Census Tract for each of the ten social indices of Maps II to XI, and a ranking for all ten (Map I). By reading across any one row one can immediately have a complete picture of any one tract for all social indices. Table VI is similar to Table V except that it gives the color rankings as seen on the maps themselves. Rank 1 stands for "blue", rank 2 for "green", rank 3 for "yellow", rank 4 for "orange", and rank 5 for "red". Hence, if the reader is studying any one map, becomes interested in certain Census Tracts and wishes to find out their standings for other maps, he can go directly to Table VI and save wear and tear on the maps themselves. If he wants more precise data about those tracts than the maps give he may refer to Table V.

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Table VII is simply the series of total rank order scores that underlies Map I. It is of interest in showing the great range of differences between parts of the city for all ten social indices added together, and the exact order of these differences by tracts.

The columns of Tables I, II, and IV used in computing ratios for the maps have been designated by an alphabetic letter. This was done to facilitate references to the tables in describing the methodology (Chapter 1, Section B).

The columns of Tables III, IV, and V containing ratios for the maps (or rank orders of ratios) have been designated by the number of the map as an aid to the reader.

The totals for all 88 Census Tracts are given at the beginning of each table rather than at the end.

TABLE I - AREA IN ACRES AND POPULATION BY COLOR AND NATIVITY, 1930: BY CENSUS TRACTS, ROCHESTER, NEW YORK

Census Tract	Area in Acres			Population in Numbers						
	Residential Area (a)	Non-Residential Area	Total Area	White (b)	Negro	Other	Total Population (c)	Native White of Native Parentage	Native White or Mixed Parentage	Foreign Born White (d)
Total -	18,990	2,172	21,162	325,294	2,679	159	328,132	127,435	123,163	74,696
1	92	0	92	1,274	74	15	1,363	574	421	279
2	147	10	157	2,145	16	5	2,166	300	1,044	801
3	115	0	115	2,481	722	1	3,204	1,702	461	318
4	164	0	164	4,472	109	1	4,582	2,386	1,367	719
5	159	0	159	4,121	3	18	4,142	2,194	1,260	667
6	224	0	224	2,577	4	1	2,582	559	1,124	894
7	45	0	45	1,760	0	0	1,760	396	806	558
8	73	0	73	3,699	1	0	3,700	516	1,633	1,550
9	81	0	81	2,674	5	51	2,730	1,523	687	464
10	369	10	379	4,367	71	4	4,442	2,448	1,213	706
11	81	0	81	2,293	147	1	2,441	546	951	796
12	73	0	73	3,047	361	1	3,406	439	1,361	1,247
13	95	0	95	4,964	130	1	5,095	482	2,354	2,128
14	102	0	102	4,797	50	0	4,847	467	2,346	1,984
15	109	0	109	4,586	20	0	4,606	612	2,320	1,654
16	117	0	117	3,122	11	5	3,138	447	1,461	1,214
17	127	10	137	4,236	0	0	4,236	364	2,168	1,704
18	1,021	0	1,021	2,608	0	0	2,608	1,264	825	519
19	627	160	787	6,000	0	0	6,000	2,814	1,839	1,347
20	310	60	370	6,437	0	0	6,437	3,431	1,975	1,031
21	253	0	253	4,328	2	0	4,330	2,350	1,410	568
22	141	0	141	4,075	2	0	4,077	2,068	1,308	699
23	268	0	268	6,062	0	0	6,062	2,709	2,112	1,241
24	174	50	224	4,594	12	2	4,608	1,612	1,810	1,172
25	91	0	91	3,022	16	0	3,038	334	1,575	1,113
26	115	0	115	4,274	29	0	4,303	1,937	1,617	720
27	98	0	98	4,145	229	2	4,376	1,187	1,826	1,132
28	74	0	74	3,190	8	9	3,207	2,094	692	404
29	195	0	195	4,819	15	3	4,846	2,903	1,212	704
30	110	0	110	3,504	0	1	3,505	1,891	1,015	598
31	241	0	241	5,916	30	14	5,960	3,264	1,776	876
32	143	0	143	2,996	2	1	2,999	1,482	1,040	474
33	70	0	70	2,025	3	0	2,028	1,133	594	298
34	156	20	176	3,062	30	0	3,092	1,614	1,043	405
35	105	70	175	2,417	13	0	2,430	1,225	823	369
36	179	0	179	4,883	7	0	4,890	2,582	1,642	659
37	193	0	193	4,421	7	0	4,428	2,059	1,599	763
38	717	1,000	1,717	2,562	6	2	2,570	1,445	756	361
39	92	0	92	1,833	1	0	1,834	378	809	646
40	84	0	84	2,164	0	0	2,164	862	837	465
41	127	0	127	3,857	1	0	3,858	713	1,802	1,342
42	138	0	138	3,329	0	0	3,329	1,022	1,490	817
43	60	0	60	2,555	0	0	2,555	77	1,460	1,018
44	84	0	84	4,544	19	0	4,563	469	2,425	1,650
45	84	0	84	2,535	38	0	2,573	1,023	951	560

TABLE I (Continued)

Census Tract	Area in Acres			Population In Numbers						
	Resi- dential Area (a)	Non-Res- idential Area	Total Area	White (b)	Negro	Other	Total Popu- lation (c)	Native White of Native Parentage	Native White of Foreign or Mixed Parentage	Foreign Born White (d)
	46	496	170	666	3,840	5	2	3,847	1,451	1,575
47	316	0	316	2,498	7	0	2,505	597	1,150	751
48	106	0	106	4,108	3	0	4,111	710	2,115	1,283
49	90	0	90	3,693	0	0	3,693	675	1,828	1,190
50	133	0	133	4,662	0	0	4,662	1,432	1,869	1,361
51	109	0	109	2,774	0	0	2,774	618	1,301	855
52	106	0	106	4,337	0	0	4,337	845	2,029	1,463
53	113	0	113	4,130	0	0	4,130	761	2,021	1,348
54	202	0	202	4,858	51	1	4,910	1,911	1,852	1,095
55	107	0	107	4,590	6	0	4,596	318	2,496	1,774
56	175	0	175	4,437	41	7	4,485	1,382	1,866	1,189
57	99	0	99	2,951	8	0	2,959	1,542	944	465
58	180	20	200	5,103	0	0	5,103	2,554	1,776	773
59	197	12	209	3,624	22	0	3,646	1,760	1,128	736
60	238	0	238	4,521	0	0	4,521	2,276	1,483	762
61	243	80	323	2,400	1	0	2,401	1,211	789	400
62	177	0	177	4,159	0	0	4,159	2,372	1,252	535
63	175	0	175	4,583	0	0	4,583	2,525	1,468	590
64	163	0	163	5,092	39	0	5,131	2,501	1,803	788
65	104	0	104	3,310	38	1	3,339	1,570	1,153	587
66	106	0	106	3,133	12	0	3,145	1,637	1,025	471
67	180	0	180	4,127	1	0	4,128	2,425	1,199	503
68	241	0	241	3,819	0	0	3,819	2,154	1,126	539
69	168	0	168	2,821	1	1	2,823	1,362	969	490
70	182	150	332	4,033	0	0	4,033	2,286	1,241	506
71	167	0	167	4,462	0	0	4,462	2,483	1,387	592
72	60	0	60	2,090	0	0	2,090	619	928	543
73	83	0	83	2,169	6	0	2,175	949	803	417
74	95	0	95	2,904	20	0	2,924	1,049	1,196	659
75	212	0	212	4,447	3	0	4,450	2,345	1,366	736
76	316	0	316	4,058	1	0	4,059	1,857	1,302	899
77	349	0	349	2,728	2	1	2,731	1,471	831	426
78	640	130	770	4,738	18	3	4,759	2,797	1,294	647
79	122	0	122	3,196	13	0	3,209	563	1,703	930
80	117	0	117	3,962	9	0	3,971	1,204	1,792	966
81	299	0	299	4,097	37	0	4,134	1,209	1,895	993
82	169	0	169	3,206	29	0	3,235	998	1,421	787
83	409	0	409	2,244	44	0	2,288	685	920	639
84	149	0	149	3,251	3	0	3,254	910	1,432	909
85	511	50	561	3,132	0	0	3,132	1,349	1,145	638
86	709	170	879	3,356	0	0	3,356	1,895	980	481
87	1516	0	1,516	5,372	12	1	5,395	2,137	2,054	1,181
88	538	0	538	2,458	0	1	2,459	891	1,022	545

TABLE II - NUMBER OF FAMILIES AND POPULATION BY SEX AND AGE GROUPS, 1930; AND TOTAL NUMBERS OF BIRTHS AND DEATHS, 1933-1935: BY CENSUS TRACTS, ROCHESTER, NEW YORK

Census Tract	Total Families (e)	Sex		Age					Total Births (l)	Total Deaths (m)
		Male	Female	Under 5 (f)	5-14 (g)	15-44 (h)	45-64 (i)	Over 64 (k)		
Total -	82,204	160,261	167,871	23,136	55,978	160,540	68,554	19,924	11,209	8,771
1	216	997	366	28	59	585	546	144	28	100
2	495	1,224	942	208	468	922	463	98	91	65
3	1,257	1,602	1,602	129	270	1,814	821	167	67	77
4	1,440	2,147	2,435	237	480	2,405	1,121	336	164	170
5	1,312	2,098	2,044	129	270	2,143	1,222	370	119	147
6	599	1,323	1,259	183	471	1,316	488	123	70	73
7	434	878	882	129	321	847	349	114	60	53
8	837	1,852	1,848	303	821	1,784	646	140	136	66
9	790	1,501	1,229	93	215	1,505	712	205	67	102
10	753	1,858	2,584	156	363	2,173	1,328	422	103	158
11	573	1,358	1,083	157	480	1,061	600	138	56	71
12	815	1,761	1,645	273	719	1,661	622	131	109	85
13	1,179	2,570	2,525	447	1,127	2,496	829	195	164	111
14	1,150	2,486	2,361	368	1,030	2,459	796	193	154	96
15	1,045	2,317	2,289	390	1,082	2,235	744	153	183	87
16	735	1,613	1,525	308	677	1,490	510	151	145	98
17	894	2,148	2,088	469	1,101	1,913	598	153	234	143
18	642	1,341	1,267	251	541	1,352	376	88	126	66
19	1,477	2,957	3,043	390	914	3,097	1,166	431	167	121
20	1,672	2,989	3,448	367	887	3,212	1,536	433	183	172
21	1,192	1,992	2,338	205	604	2,031	1,157	332	99	141
22	1,056	1,924	2,153	234	584	2,036	929	294	141	120
23	1,679	2,865	3,197	417	879	3,064	1,291	409	259	184
24	1,068	2,333	2,275	390	1,018	2,240	762	198	186	103
25	651	1,544	1,494	304	745	1,371	479	138	146	75
26	1,005	2,012	2,291	255	873	1,983	888	301	150	130
27	980	2,273	2,103	474	918	1,989	774	220	220	136
28	1,075	1,500	1,707	67	199	1,730	936	274	102	135
29	1,481	1,838	3,008	141	322	2,501	1,368	513	114	187
30	1,041	1,542	1,963	159	362	1,751	890	334	109	115
31	1,656	2,491	3,469	274	688	2,934	1,545	515	100	183
32	906	1,442	1,557	185	385	1,333	754	279	128	119
33	574	954	1,074	167	278	992	427	164	77	71
34	848	1,470	1,622	211	447	1,421	744	267	118	101
35	593	1,095	1,335	136	361	1,170	523	240	55	87
36	1,233	2,317	2,573	306	765	2,324	1,164	328	163	133
37	1,258	2,014	2,414	237	552	2,169	1,108	362	115	150
38	563	1,156	1,414	147	340	1,245	1,758	276	84	69
39	452	866	968	114	225	975	350	166	55	50
40	527	1,079	1,085	154	399	1,064	417	129	97	58
41	827	2,006	1,852	373	962	1,750	616	157	159	67
42	753	1,697	1,632	313	737	1,529	604	141	119	84
43	531	1,275	1,280	281	701	1,090	379	104	135	65
44	1,011	2,310	2,253	410	1,066	2,138	742	206	179	105
45	692	1,226	1,347	138	299	1,261	649	224	65	95

TABLE II (Continued)

Census Tract	Total Families (e)	Sex		Age					Total Births (l)	Total Deaths (m)
		Male	Female	Under 5 (f)	5-14 (g)	15-44 (h)	45-64 (i)	Over 64 (k)		
46	970	1,878	1,969	274	589	2,051	739	193	140	82
47	612	1,246	1,259	226	502	1,303	391	83	75	50
48	901	2,085	2,026	273	900	2,139	646	145	100	77
49	867	1,858	1,835	207	739	2,006	584	157	80	79
50	1,135	2,246	2,416	279	762	2,396	949	274	137	121
51	641	1,382	1,392	170	483	1,477	517	127	95	61
52	1,048	2,229	2,108	318	846	2,212	729	232	127	121
53	856	2,066	2,064	359	1,000	1,953	659	159	148	76
54	1,211	2,393	2,517	427	898	2,582	833	169	189	96
55	931	2,338	2,258	414	1,225	2,119	661	177	249	96
56	1,052	2,238	2,247	314	931	2,203	822	215	170	108
57	871	1,398	1,561	152	358	1,411	748	290	96	109
58	1,398	2,397	2,706	249	716	2,421	1,354	363	139	140
59	932	1,831	1,815	263	555	1,736	829	261	135	122
60	1,279	2,209	2,312	364	667	2,358	907	225	177	119
61	705	1,179	1,222	252	301	1,335	414	99	93	58
62	1,133	1,977	2,182	315	590	2,191	828	229	147	104
63	1,168	2,012	2,571	234	654	2,149	1,130	416	101	154
64	1,364	2,457	2,674	353	785	2,472	1,153	362	171	171
65	870	1,640	1,699	235	533	1,555	823	238	127	121
66	861	1,490	1,655	199	441	1,506	747	243	107	105
67	1,130	1,975	2,153	230	614	2,007	1,017	258	101	119
68	1,089	1,863	1,956	355	566	2,065	652	180	134	68
69	728	1,364	1,459	205	464	1,321	643	188	83	79
70	1,072	1,926	2,107	279	633	2,024	859	238	154	110
71	1,222	2,179	2,283	384	716	2,356	828	178	137	86
72	486	1,044	1,046	188	421	998	362	121	92	58
73	507	1,102	1,073	158	381	1,089	410	137	92	68
74	673	1,464	1,460	274	599	1,328	553	169	121	78
75	1,137	2,158	2,292	261	633	2,171	1,076	309	141	128
76	1,074	1,967	2,092	300	719	2,087	768	183	136	90
77	714	1,333	1,398	191	469	1,384	602	121	122	47
78	1,302	2,116	2,643	285	781	2,303	1,072	137	128	119
79	668	1,616	1,593	239	798	1,660	423	89	105	61
80	907	1,954	2,017	249	783	1,996	754	186	130	85
81	903	2,071	2,063	417	962	2,081	547	124	153	106
82	734	1,610	1,625	299	709	1,600	510	117	120	51
83	532	1,158	1,130	217	514	1,219	287	51	102	46
84	700	1,659	1,595	290	700	1,687	481	96	161	64
85	729	1,552	1,580	250	642	1,406	613	220	112	86
86	896	1,646	1,710	320	616	1,707	565	148	114	71
87	1,210	2,799	2,596	490	1,196	2,636	847	226	248	110
88	544	1,222	1,237	268	582	1,219	315	75	119	47

TABLE III - SELECTED POPULATION RATIOS: FOREIGN BORN, SIZE OF FAMILY, DENSITY AND AGE-GROUPS FOR 1930;
BIRTH AND DEATH RATIOS FOR 1933-1935: BY CENSUS TRACTS, ROCHESTER, NEW YORK

Census Tract	Percentage Foreign Born (Map VI)	Average Number of Individuals Per Family VIII (Map VII)	Average Number of Individuals Per Acre VII (Map VIII)	Percentage Age Distribution					Average Annual Births per 1000 Females 15-44 years (Map IX)	Average Annual Deaths per 1000 Population (Map X)
				Under 5	5-14	15-44	45-64	Over 64		
Total -	23.0	4.1	17.28	7.0	17.1	49.2	20.5	6.1	46.24	8.91
1	21.9	6.3	14.82	2.1	4.3	42.9	40.1	10.6	31.90	24.46
2	37.3	4.4	14.73	9.6	21.8	42.5	21.6	4.5	65.80	10.00
3	9.9	2.5	27.86	4.0	8.4	56.6	25.8	5.2	24.62	8.01
4	16.1	3.2	27.94	5.2	10.5	52.5	24.5	7.3	45.46	12.37
5	16.2	3.2	26.05	3.1	6.5	51.7	29.8	8.9	37.02	11.83
6	34.7	4.3	11.53	7.1	18.2	51.0	18.9	4.8	35.46	9.42
7	31.7	4.0	39.11	7.3	18.2	48.4	19.6	6.5	47.22	10.04
8	41.9	4.4	50.68	8.2	22.3	48.2	17.5	3.8	50.82	5.94
9	17.4	3.4	33.70	3.4	7.9	55.1	26.1	7.5	29.68	12.45
10	16.2	5.9	12.04	3.5	8.2	48.9	29.9	9.5	31.60	11.86
11	34.7	4.3	30.14	6.4	19.7	43.5	24.7	5.7	35.18	9.70
12	40.9	4.2	46.66	8.0	21.0	48.8	18.3	3.8	43.74	8.32
13	42.9	4.3	53.63	8.8	22.1	49.0	16.3	3.8	43.80	7.26
14	41.4	4.2	47.52	7.6	21.3	50.7	16.4	4.0	41.76	6.60
15	36.1	4.4	42.26	8.5	23.4	48.6	16.2	3.3	54.58	6.30
16	38.9	4.3	26.82	9.8	21.5	47.6	16.3	4.8	64.88	10.41
17	40.2	4.7	33.35	11.1	26.0	45.2	14.1	3.6	81.54	11.25
18	19.9	4.1	2.55	9.6	20.7	51.9	14.4	3.4	62.12	8.44
19	22.4	4.1	9.57	6.5	15.2	51.6	19.6	7.2	35.94	6.72
20	16.0	3.8	20.76	5.7	13.8	50.1	23.7	6.7	37.98	8.91
21	13.1	3.6	17.11	4.7	13.9	46.9	26.8	7.7	32.50	10.85
22	17.2	3.9	28.91	5.7	14.3	49.9	22.9	7.2	46.16	9.81
23	20.5	3.6	22.62	6.9	14.5	50.6	21.3	6.7	56.36	10.12
24	25.5	4.3	26.48	8.5	22.1	48.6	16.5	4.3	55.36	7.45
25	36.8	4.7	33.38	10.0	24.6	45.1	15.8	4.5	71.00	8.22
26	16.8	4.3	37.42	5.9	20.3	46.0	20.8	7.0	50.42	10.07
27	27.3	4.5	44.65	10.8	20.8	45.7	17.7	5.0	73.74	10.36
28	12.7	3.0	43.34	2.1	6.2	53.9	29.3	8.5	39.30	14.03
29	14.6	3.3	24.85	2.9	6.6	51.6	28.3	10.6	30.38	12.86
30	17.1	3.4	31.86	4.5	10.3	50.0	25.7	9.5	41.50	10.94
31	14.8	3.6	24.73	4.6	11.5	49.2	26.1	8.6	22.72	10.23
32	15.8	3.3	20.97	6.2	12.8	46.4	25.3	9.3	61.26	13.23
33	14.7	3.5	28.97	8.2	13.7	48.9	21.1	8.1	51.74	11.67
34	13.2	3.6	19.82	6.8	14.5	45.9	24.2	8.6	55.36	10.89
35	15.3	4.1	23.14	5.6	14.9	48.2	21.4	9.9	31.34	11.93
36	13.5	4.0	27.32	6.2	15.6	47.5	23.9	6.7	46.76	9.07
37	17.2	3.5	22.94	5.4	12.5	48.9	25.0	8.2	35.34	11.29
38	14.1	4.6	3.58	5.7	6.0	41.6	31.1	10.7	44.98	8.95
39	35.2	4.0	19.93	6.2	12.3	53.2	19.2	9.1	37.60	9.09
40	21.5	4.1	25.76	7.1	18.4	49.2	19.3	6.0	60.78	8.93
41	34.8	4.7	30.38	9.7	24.8	45.4	16.0	4.1	60.56	5.79
42	24.5	4.4	24.12	9.4	22.1	45.9	18.4	4.2	51.88	8.41
43	39.8	4.8	42.58	11.0	27.4	42.7	14.8	4.1	82.56	8.48
44	36.3	4.5	54.32	9.0	23.4	46.8	16.3	4.5	55.82	7.67
45	22.1	3.7	30.63	5.4	11.6	49.0	25.3	8.7	34.36	12.31

Table III (Continued)

Census Tract	Percentage Foreign Born (Map VI)	Average Number of Individuals Per Family <i>VIII</i> (Map VII)	Average Number of Individuals Per Acre <i>VII</i> (Map VIII)	Percentage Age Distribution					Average Annual Births per 1000 Females 15-44 years (Map IX)	Average Annual Deaths per 1000 population (Map X)
				Under 5	5-14	15-44	45-64	Over 64		
46	21.2	4.0	7.76	7.1	15.3	53.3	19.3	5.0	45.50	7.10
47	30.1	4.1	7.93	9.0	20.0	52.1	15.6	3.3	38.38	6.65
48	31.2	4.6	38.78	6.6	22.0	52.2	15.7	3.5	31.16	6.24
49	32.2	4.2	41.03	5.6	20.0	54.3	15.8	4.2	26.58	7.13
50	29.2	4.1	35.05	6.0	16.3	51.4	20.4	5.9	38.12	8.65
51	30.8	4.3	25.45	6.1	17.4	53.2	18.7	4.6	42.88	7.33
52	33.7	4.1	40.92	7.3	19.5	51.1	16.8	5.3	38.28	9.30
53	32.6	4.8	36.55	8.7	24.3	47.2	16.0	3.8	50.52	6.13
54	22.5	4.0	24.31	8.7	18.3	52.6	17.0	3.4	48.80	6.52
55	38.6	4.9	42.95	9.0	26.7	46.0	14.4	3.8	78.34	6.96
56	26.8	4.3	25.63	7.0	20.7	49.2	18.3	4.8	51.44	8.03
57	15.8	3.4	29.89	5.1	12.1	47.6	25.4	9.8	45.36	12.28
58	15.1	3.6	28.35	4.9	14.0	47.4	26.7	7.1	38.28	9.14
59	20.3	3.9	18.51	7.2	15.2	47.6	22.8	7.2	51.84	11.15
60	16.8	3.5	19.00	8.0	14.8	52.1	20.0	5.0	50.04	8.77
61	16.7	3.4	9.88	10.5	12.5	55.7	17.2	4.1	46.44	8.05
62	12.9	3.7	23.50	7.6	14.2	52.8	20.0	5.5	44.72	8.23
63	12.9	3.9	26.19	5.1	14.3	46.8	24.8	9.1	31.34	11.20
64	15.5	3.8	31.48	6.9	15.2	48.2	22.6	7.0	46.12	11.11
65	17.7	3.8	32.10	7.0	16.0	45.2	24.7	7.1	54.44	12.08
66	15.0	3.6	29.67	6.3	14.0	48.1	23.9	7.7	47.36	11.13
67	12.2	3.6	22.93	5.6	14.9	48.6	24.6	6.2	33.54	9.61
68	14.1	3.5	15.85	9.3	14.8	54.1	17.1	4.7	43.26	5.94
69	17.4	3.9	16.80	7.3	16.4	46.8	22.8	6.6	41.88	9.33
70	12.5	3.8	22.16	6.9	15.7	50.1	21.4	5.9	50.72	9.09
71	13.3	3.7	26.72	8.6	16.0	52.8	18.6	4.0	38.76	6.42
72	26.0	4.3	34.83	9.0	20.2	47.7	17.3	5.8	61.46	9.25
73	19.2	4.3	26.20	7.3	17.5	50.1	18.9	6.3	56.32	10.42
74	22.7	4.3	30.78	9.4	20.5	45.4	18.9	5.8	60.74	8.89
75	16.6	3.9	20.99	5.9	14.2	48.8	24.2	6.9	43.30	9.59
76	22.2	3.8	12.84	7.4	17.7	51.5	18.9	4.5	43.44	7.39
77	15.6	3.8	7.82	7.0	17.2	49.3	22.1	4.4	58.76	5.74
78	13.7	3.6	7.44	6.0	16.4	48.4	22.6	6.6	37.06	8.34
79	29.1	4.8	26.30	7.4	25.0	51.7	13.2	2.8	42.16	6.34
80	24.4	4.4	33.91	6.3	19.8	50.3	19.0	4.7	43.42	7.14
81	24.2	4.6	13.83	10.1	23.3	50.4	13.2	3.0	49.02	8.55
82	24.5	4.4	19.14	9.2	21.7	49.7	15.8	3.6	50.00	5.26
83	28.5	4.3	5.59	9.5	22.5	53.3	12.5	2.2	55.78	6.70
84	28.0	4.6	21.84	8.9	21.5	51.8	14.8	3.0	63.62	6.56
85	20.4	4.3	6.12	8.0	20.6	44.8	19.6	7.0	53.10	9.15
86	14.3	3.7	4.73	9.5	18.4	50.9	16.8	4.4	44.52	7.05
87	22.0	4.4	3.56	9.1	22.2	48.8	15.7	4.2	62.72	6.80
88	22.2	4.5	4.57	10.9	23.7	49.5	12.8	3.0	65.08	6.37

TABLE IV - TOTAL CASES REGISTERED IN SELECTED SOCIAL AGENCIES FOR VARIOUS PERIODS OF TIME BETWEEN 1928 AND 1938: GIVEN IN NUMBERS AND RATIOS BY CENSUS TRACTS, ROCHESTER, NEW YORK

Census Tract	Dept. of Public Welfare		Monroe County Children's Ct.		Protective Dept. S.P.C.C.		Rochester Council Boy Scouts of Am.		N.Y. Dept. of Health Div. of Tuberculosis	
	Nov. 1-15, 1936		1928-1937(boys)		1931 - 1936		Jan. 1, 1938		New Cases 1934-1937	
	No.	% of All Families	No.	% of All Boys	No.	% of All Families	No.	% of All Boys	No.	% of Population
	(n)	(Map II)	(p)	(Map III)	(r)	(Map IV)	(s)	(Map V)	(t)	(Map XI)
Total -	6,814	8.29	1,005	3.59	2,871	3.49	3,542	8.94	1,236	0.38
1	76	35.18	10	33.33	16	7.41	4	9.09	28	2.05
2	102	20.61	15	6.41	28	5.66	10	2.96	18	.83
3	104	8.27	18	13.33	45	3.58	32	16.00	28	.87
4	179	12.43	14	5.83	95	6.60	31	8.64	23	.50
5	168	12.80	25	18.51	90	6.86	13	6.50	31	.75
6	77	12.85	11	4.66	43	7.18	13	3.98	11	.43
7	27	6.22	5	3.10	10	2.30	13	5.78	3	.17
8	116	13.86	17	4.14	55	6.57	45	8.01	15	.40
9	131	16.58	11	10.18	63	7.98	13	8.44	17	.62
10	78	10.36	17	9.34	48	6.37	35	13.46	25	.56
11	100	17.45	10	4.17	43	7.50	6	1.88	19	.78
12	204	25.03	31	8.61	82	10.06	29	5.85	26	.76
13	228	19.34	27	4.78	81	6.87	44	5.59	20	.39
14	146	12.70	26	5.05	63	5.48	30	4.29	10	.21
15	179	17.13	28	5.17	49	4.69	21	2.85	23	.50
16	160	21.77	22	6.49	54	7.35	26	5.27	14	.45
17	226	25.28	33	5.99	50	5.59	33	4.20	28	.66
18	20	3.12	9	3.32	14	2.18	77	19.44	14	.54
19	41	2.78	9	1.97	23	1.56	67	10.28	16	.27
20	29	1.73	2	.45	27	1.62	74	11.80	19	.30
21	20	1.68	5	1.65	6	0.50	57	14.07	9	.21
22	40	3.79	10	3.42	39	3.69	47	11.49	14	.34
23	141	8.40	13	2.95	66	3.93	48	7.41	19	.31
24	90	8.43	20	3.93	53	4.96	50	7.10	5	.11
25	150	23.04	15	4.02	36	5.53	26	4.95	11	.36
26	168	16.72	13	2.97	61	6.07	28	4.96	22	.51
27	211	21.53	38	8.28	89	9.08	24	3.45	18	.41
28	172	16.00	8	8.00	69	6.42	18	13.53	17	.53
29	59	3.98	2	1.24	24	1.62	38	16.38	23	.47
30	62	5.96	10	5.52	32	3.07	17	6.51	11	.31
31	32	1.93	5	1.45	14	0.84	106	22.04	13	.22
32	159	17.55	9	4.66	60	6.62	27	9.47	16	.53
33	59	10.28	5	3.60	19	3.31	36	16.14	6	.30
34	76	8.96	8	3.57	29	3.42	54	16.41	9	.29
35	24	4.05	3	1.66	19	3.20	35	14.06	5	.20
36	60	4.87	7	1.83	22	1.78	63	11.75	13	.26
37	25	1.99	4	1.45	8	0.64	67	16.96	13	.29
38	21	3.73	1	.59	8	1.42	45	18.60	14	.54
39	10	2.21	5	4.42	10	2.21	14	8.24	9	.49
40	45	8.54	6	3.00	24	4.55	13	4.69	2	.09
41	139	16.81	20	4.16	41	4.96	20	2.99	13	.34
42	93	12.35	13	3.52	37	4.91	50	9.52	4	.12
43	150	28.25	13	3.70	31	5.84	4	0.81	13	.51
44	202	19.98	19	3.56	46	4.55	39	5.28	19	.42
45	97	14.02	8	5.33	35	5.06	10	4.57	11	.43

TABLE IV (Continued)

Census Tract	Dept. of Public Welfare		Monroe County Children's Ct.		Protective Dept. S.P.C.C.		Rochester Council Boy Scouts of Am.		N.Y. Dept. of Health Div. of Tuberculosis	
	Nov. 1-15, 1936		1928-1937(boys)		1931 - 1936		Jan. 1, 1938		New Cases 1934-1937	
	No.	% of All Families	No.	% of All Boys	No.	% of All Families	No.	% of All Boys	No.	% of Population
(n)	(Map II)	(p)	(Map III)	(r)	(Map IV)	(s)	(Map V)	(t)	(Map XI)	
46	19	1.96	11	3.73	8	0.82	61	14.12	18	.47
47	23	3.76	7	2.79	16	2.61	29	7.97	17	.68
48	27	3.00	12	2.67	25	2.78	19	3.24	23	.56
49	24	2.77	11	2.97	21	2.42	14	2.96	10	.27
50	49	4.32	7	1.84	16	1.41	32	6.14	8	.17
51	12	1.87	3	1.24	10	1.56	18	5.50	8	.29
52	59	5.63	10	2.36	44	4.20	26	4.47	10	.23
53	119	13.90	17	3.40	29	3.39	34	5.00	15	.36
54	45	3.72	7	1.56	25	2.06	51	7.69	11	.22
55	202	21.70	48	7.83	50	5.37	45	5.49	19	.41
56	119	11.31	34	7.30	59	5.61	34	5.46	25	.56
57	51	5.86	7	3.91	26	2.98	33	12.94	10	.34
58	28	2.00	8	2.24	23	1.64	74	15.32	11	.22
59	85	9.12	14	5.03	38	4.08	38	9.29	14	.38
60	23	1.80	3	.90	17	1.33	79	15.31	17	.38
61	4	.57	6	3.97	8	1.14	53	19.13	9	.37
62	8	.71	3	1.02	12	1.06	89	19.65	13	.31
63	32	2.74	2	.61	20	1.71	85	19.14	18	.39
64	98	7.18	11	2.80	41	3.01	70	12.30	13	.25
65	130	14.94	11	4.12	41	4.71	27	7.03	14	.42
66	39	4.53	6	2.71	19	2.21	46	14.38	13	.41
67	21	1.86	6	1.95	9	0.80	102	24.17	13	.31
68	14	1.28	3	1.06	16	1.47	58	12.58	6	.16
69	45	6.18	3	1.29	16	2.20	38	11.34	4	.14
70	30	2.80	2	.63	15	1.40	47	10.31	11	.27
71	17	1.39	1	.28	8	0.66	99	18.00	14	.31
72	62	12.76	6	2.84	18	3.70	22	7.21	4	.19
73	38	7.50	10	5.23	11	2.17	12	4.44	12	.55
74	108	16.05	5	1.67	29	4.31	19	4.35	17	.58
75	58	5.10	6	1.89	35	3.08	46	10.29	14	.31
76	24	2.23	8	2.22	15	1.40	60	11.26	7	.17
77	14	1.96	12	5.11	22	3.08	48	14.54	3	.11
78	12	.92	0	.00	12	0.92	153	28.70	9	.19
79	38	5.69	13	3.26	21	3.14	15	2.89	18	.56
80	53	5.84	9	2.29	24	2.65	32	6.20	14	.35
81	59	6.53	10	2.08	28	3.10	54	7.83	13	.31
82	49	6.68	5	1.41	14	1.91	40	7.94	13	.40
83	44	8.27	8	3.11	23	4.32	15	4.10	6	.26
84	66	9.43	12	3.43	24	3.43	26	5.25	12	.37
85	50	6.86	9	2.80	22	3.02	42	9.42	12	.38
86	19	2.12	7	2.27	20	2.23	49	10.47	8	.24
87	121	10.00	20	3.34	65	5.37	38	4.51	28	.52
88	37	6.80	12	4.12	19	3.49	18	4.24	5	.20

TABLE V - RANK ORDER OF RATIOS FOR THE SELECTED SOCIAL INDICES OF MAPS II TO XI, AND THE RANK ORDER OF THEIR SUMS (MAP I): BY CENSUS TRACTS, ROCHESTER, NEW YORK

Census Tract	Map I Composite	Map II Relief	Map III Juvenile Delinquency	Map IV SFCC	Map V Scouts	Map VI Foreign Born	Map VII Density	Map VIII Size of Family	Map IX Birth Rate	Map X Death Rate	Map XI Tuberculosis
1	77	88	88	84	40	46	19	88	10	88	88
2	85	80	77	72	84	80	18	66	83	59	86
3	29	49	86	50	14	1	53	1	2	29	87
4	60	61	75	78	41	26	54	4	42	83	66
5	62	64	87	80	54	28	45	3	18	77	83
6	67	65	65	82	79	73	14	61	16	54	59
7	48	41	41	31	58	69	76	41	48	60	7
8	73	66	61	77	44	87	86	70	58	4	53
9	67	72	85	86	42	36	69	10	4	84	80
10	61	58	84	75	23	27	15	87	9	78	78
11	79	76	63	85	87	74	60	53	14	57	85
12	82	85	83	88	57	85	84	50	36	34	84
13	76	78	67	81	59	88	87	63	37	24	50
14	69	62	69	68	75	86	85	51	50	14	14
15	80	75	71	60	86	77	79	69	65	8	65
16	84	83	78	83	64	82	51	55	81	65	61
17	88	86	76	70	77	84	67	82	87	74	81
18	28	24	44	26	5	40	1	44	78	37	73
19	14	21	24	16	35	51	12	43	17	17	24
20	9	7	3	18	27	25	28	32	21	43	30
21	4	6	17	1	20	7	22	17	11	67	13
22	38	28	47	51	29	34	56	33	45	58	41
23	44	50	37	53	49	43	33	16	71	62	33
24	53	51	56	64	51	58	49	62	66	27	2
25	81	84	58	69	68	79	68	81	84	32	43
26	72	73	39	74	67	31	74	56	55	61	71
27	87	81	82	87	80	61	83	73	85	64	54
28	56	70	81	76	22	4	82	2	27	87	69
29	19	29	11	19	12	15	41	5	5	85	64
30	43	39	74	39	53	33	65	7	28	69	35
31	5	11	15	6	3	17	40	15	1	63	16
32	64	77	66	79	37	23	29	6	76	86	70
33	37	57	52	45	13	16	57	13	60	76	31
34	31	53	51	47	11	8	26	18	67	68	28
35	23	30	18	44	21	19	36	46	7	79	20
36	25	33	20	22	53	10	52	38	47	46	23
37	10	14	14	2	10	35	35	12	15	75	29
38	21	26	4	14	8	12	3	78	40	45	72
39	41	17	64	29	43	76	27	42	20	47	63
40	50	52	40	59	69	45	44	47	75	44	1
41	74	74	62	63	82	75	61	80	73	3	39
42	49	60	49	62	36	56	38	71	62	36	4
43	86	87	53	73	88	83	80	84	88	38	67
44	78	79	50	58	63	78	88	74	69	28	57
45	66	68	73	65	70	48	62	25	13	82	60

TABLE V (Continued)

Census Tract	Map I Com- posite	Map II Relief	Map III Juvenile Delin- quency	Map IV SPCC	Map V Scouts	Map VI Foreign Born	Map VII Density	Map VIII Size of Family	Map IX Birth Rate	Map X Death Rate	Map XI Tuber- culosis
46	22	12	54	5	19	44	9	39	43	21	62
47	33	27	33	33	45	66	11	45	25	15	82
48	51	23	31	35	81	68	75	76	6	7	76
49	39	20	38	32	83	70	78	52	3	22	25
50	30	31	21	13	56	65	72	48	22	40	8
51	27	10	10	17	60	67	42	64	31	25	27
52	52	35	30	55	72	72	77	49	23	52	18
53	65	67	46	46	66	71	73	85	56	6	44
54	24	25	16	24	48	52	39	40	51	12	17
55	83	82	80	66	61	81	81	86	86	19	56
56	71	59	79	71	62	60	43	54	59	30	75
57	36	38	55	36	24	24	59	8	41	81	40
58	15	15	27	20	15	22	55	19	24	49	15
59	54	54	68	54	39	41	23	35	61	72	49
60	13	8	7	10	16	32	24	14	54	41	47
61	11	1	57	9	7	30	13	9	46	31	46
62	6	2	8	8	4	5	37	24	39	33	32
63	17	19	5	21	6	6	46	37	8	73	51
64	35	46	34	37	26	20	64	27	44	70	21
65	70	69	60	61	52	38	66	31	64	80	58
66	33	32	32	28	18	18	58	21	49	71	55
67	7	9	23	4	2	2	34	22	12	56	38
68	2	4	9	15	25	13	20	11	32	5	6
69	20	40	12	27	30	37	21	34	29	53	5
70	16	22	6	12	33	3	32	28	57	48	26
71	3	5	2	3	9	9	50	20	26	11	34
72	59	63	36	52	50	59	71	59	77	51	11
73	63	47	72	25	73	39	47	57	70	42	74
74	75	71	19	56	74	53	63	65	74	66	79
75	26	34	22	40	34	29	30	36	33	55	37
76	11	18	26	11	31	49	16	29	34	26	9
77	18	13	70	41	17	21	10	30	72	2	3
78	1	3	1	7	1	11	8	23	19	35	10
79	55	36	43	43	85	64	48	83	30	9	76
80	45	37	29	34	55	55	70	67	36	23	42
81	42	42	25	42	47	54	17	77	52	39	36
82	32	43	13	23	46	57	25	68	53	1	52
83	46	48	42	57	78	63	6	60	68	16	22
84	58	55	48	48	65	62	31	79	80	13	45
85	40	45	35	38	38	42	7	58	63	50	48
86	8	16	28	30	32	14	5	26	38	20	19
87	57	56	45	67	71	47	2	72	79	18	68
88	47	44	59	49	76	50	4	75	82	10	12

TABLE VI - COLOR RANKINGS OF THE TEN SOCIAL INDICES OF MAPS II TO XI, AND THE COMPOSITE INDEX OF MAP I:
BY CENSUS TRACTS, ROCHESTER, NEW YORK

Blue Census Tracts are numbered 1; green, 2; yellow, 3; orange, 4; and red, 5.

Census Tract	Map I Composite	Map II Relief	Map III Juvenile Delinquency	Map IV SPOC	Map V Scouts	Map VI Foreign Born	Map VII Density	Map VIII Size of Family	Map IX Birth Rate	Map X Death Rate	Map XI Tuberculosis
1	5	5	5	5	3	3	2	5	1	5	5
2	5	5	5	5	5	5	2	4	5	4	5
3	2	3	5	3	1	1	3	1	1	2	5
4	4	4	5	5	3	2	3	1	3	5	4
5	4	4	5	5	4	2	3	1	2	5	5
6	4	4	4	5	5	5	1	4	1	3	4
7	3	2	3	2	4	4	5	3	3	4	1
8	5	4	4	5	3	5	5	4	4	1	3
9	4	4	5	5	3	2	4	1	1	5	5
10	4	3	5	5	2	2	1	5	1	5	5
11	5	5	4	5	5	5	4	4	1	3	5
12	5	5	5	5	4	5	5	4	3	2	5
13	5	5	4	5	4	5	5	4	3	2	3
14	4	4	4	4	5	5	5	4	2	1	1
15	5	5	5	4	5	5	5	4	4	1	4
16	5	5	5	5	4	5	3	4	5	4	4
17	5	5	5	5	5	5	4	5	5	4	5
18	2	2	3	2	1	2	1	3	5	2	5
19	1	2	2	1	3	3	1	3	1	1	2
20	1	1	1	2	2	2	2	2	2	3	2
21	1	1	1	1	2	1	2	2	1	4	1
22	3	2	3	3	3	2	4	3	3	3	3
23	3	3	3	3	4	2	3	2	4	4	2
24	3	3	3	4	4	3	3	4	4	2	1
25	5	5	4	5	4	5	4	5	5	2	3
26	5	4	3	5	4	2	5	4	4	4	4
27	5	5	5	5	5	4	5	5	5	4	3
28	4	4	5	5	2	1	5	1	2	5	5
29	2	2	1	2	1	1	3	1	1	5	4
30	3	2	5	3	4	2	4	1	2	4	2
31	1	1	1	1	1	1	3	2	1	4	1
32	4	5	4	5	3	2	2	1	5	5	5
33	3	3	3	3	1	1	4	1	4	5	2
34	2	3	3	3	1	1	2	2	4	4	2
35	2	2	1	3	2	2	3	3	1	5	1
36	2	2	2	2	2	1	3	3	3	3	2
37	1	1	1	1	1	2	3	1	1	4	2
38	2	2	1	1	1	1	1	5	3	3	5
39	3	1	4	2	3	5	2	3	2	3	4
40	3	3	3	4	4	3	3	3	5	3	1
41	5	4	4	4	5	5	4	5	5	1	3
42	3	4	3	4	3	3	3	4	4	2	1
43	5	5	3	5	5	5	5	5	5	2	4
44	5	5	3	4	4	5	5	5	4	2	3
45	4	4	5	4	4	3	4	2	1	5	4

TABLE VI (Continued)

Census Tract	Map I Composite	Map II Relief	Map III Juvenile Delinquency	Map IV SPCC	Map V Scouts	Map VI Foreign Born	Map VII Density	Map VIII Size of Family	Map IX Birth Rate	Map X Death Rate	Map XI Tuberculosis
46	2	1	3	1	2	3	1	3	3	2	4
47	2	2	2	2	4	4	1	3	2	1	5
48	3	2	2	2	5	4	5	5	1	1	5
49	3	2	3	2	5	4	5	4	1	2	2
50	2	2	2	1	4	4	5	3	2	3	1
51	2	1	1	1	4	4	3	4	2	2	2
52	3	2	2	4	5	5	5	3	2	3	2
53	4	4	3	3	4	4	5	5	4	1	3
54	2	2	1	2	4	3	3	3	3	1	1
55	5	5	5	4	4	5	5	5	5	1	3
56	4	3	5	5	4	3	3	4	4	2	5
57	3	2	3	3	2	2	4	1	3	5	3
58	1	1	2	2	1	2	4	2	2	3	1
59	3	3	4	3	3	2	2	3	4	4	3
60	1	1	1	1	1	2	2	1	4	3	3
61	1	1	3	1	1	2	1	1	3	2	3
62	1	1	1	1	1	1	3	2	3	2	2
63	1	2	1	2	1	1	3	3	1	4	3
64	2	2	2	3	2	2	4	2	3	4	2
65	4	4	4	4	4	2	4	2	4	5	3
66	2	2	2	2	2	2	4	2	3	4	3
67	1	1	2	1	1	1	3	2	1	3	2
68	1	1	1	1	2	1	2	1	3	1	1
69	2	2	1	2	3	2	2	3	2	3	1
70	1	2	1	1	3	1	3	2	4	3	2
71	1	1	1	1	1	1	3	2	2	1	2
72	4	4	2	3	4	3	4	4	5	3	1
73	4	3	5	2	5	2	3	4	4	4	5
74	5	4	1	4	5	3	4	4	5	3	5
75	2	2	2	3	3	2	2	3	3	3	2
76	1	1	2	1	3	3	1	2	3	2	1
77	1	1	4	3	2	2	1	2	5	1	1
78	1	1	1	1	1	1	1	2	2	2	1
79	4	2	3	3	5	4	3	5	2	1	5
80	3	2	2	2	4	3	4	4	3	2	3
81	3	2	2	3	4	3	1	5	3	3	2
82	2	2	1	2	4	3	2	4	4	1	3
83	3	3	3	4	5	4	1	4	4	1	2
84	4	3	3	3	4	4	3	5	5	1	3
85	3	2	2	3	3	2	1	4	4	3	3
86	1	1	2	2	3	3	1	2	3	2	2
87	4	3	3	4	4	3	1	4	5	1	4
88	3	2	4	3	5	3	1	5	5	1	1

TABLE VII - TOTAL RANK ORDER SCORES UNDERLYING MAP I, GIVEN IN ORDER OF SIZE FROM LOWEST TO HIGHEST

Composite Rank	Total Score	Census Tract	Composite Rank	Total Score	Census Tract
BLUE (Above Average II)			YELLOW (Average) Cont.		
1	118	78	45	448	80
2	140	68	46	460	83
3	169	71	47	461	88
4	181	21	48	472	7
5	187	31	49	474	42
6	192	62	50	476	40
7	202	67	51	478	48
8	228	86	52	483	52
9	234	20	53	486	24
10	241	37	54	496	59
11	249	76	ORANGE (Below Average I)		
12	249	61	55	517	79
13	253	60	56	520	28
14	260	19	57	525	87
15	261	58	58	526	84
16	267	70	59	529	72
17	272	63	60	530	4
18	279	77	61	534	10
GREEN (Above Average I)			62	539	5
19	286	29	63	546	73
20	288	69	64	549	32
21	302	38	65	560	53
22	308	46	66	566	45
23	320	35	67	568	6
24	324	54	68	568	9
25	344	36	69	574	14
26	350	75	70	579	65
27	353	51	71	592	56
28	372	18	RED (Below Average II)		
29	372	3	72	601	26
30	376	50	73	606	8
31	377	34	74	612	41
32	381	82	75	620	74
33	382	47	76	634	13
34	382	66	77	639	1
35	389	64	78	644	44
YELLOW (Average)			79	654	11
36	406	57	80	655	15
37	420	33	81	666	25
38	422	22	82	686	12
39	423	49	83	698	55
40	424	85	84	703	16
41	428	39	85	705	2
42	431	81	86	741	43
43	442	30	87	750	27
44	447	23	88	784	17

Chapter 3

Manual for Interpreting the Maps

Maps I to XI provide the Rochester community with factual representations of certain segments of its social life. The understanding or interpretation of such research findings is, however, not an easy task. In this chapter we shall outline the methods by which these interpretations can most reliably be made, and shall provide sufficient examples to familiarize interested readers with their use. In this way we feel that the community will be best equipped to utilize the studies.

Objective understanding depends, by and large, upon a knowledge of three factors: (I) the method and data underlying the maps, (II) existing interpretations of similar studies, and (III) certain techniques such as statistical correlation to check our hunches about specific causal relations. We shall discuss each of these separately and use Maps I and III as illustrations.

I

A knowledge of the data and method underlying a map tells what it concerns and how it was made. This involves the nature of census tracts, the character and gathering of the data, the computation of the ratio and meaning of the color scheme. This material has been elaborately outlined in Chapter 1, and should be completely understood before interpretation is begun.

Example -- Map I (see Chapter 1).

II

Existing interpretations of similar ecological studies provide us with a fund of competent thinking by experts in the field. These interpretations are attempts to understand how community life becomes spatially patterned and what form these spatial patterns take,

The basic hypothesis is that the spatial patterning of community life is primarily the result of economic competition operating within the limitations imposed by topography or by society. Commerce, industry, and housing have competed and are competing with each other for geographic locations in the community, and persons or families are competing with other persons or families for location within these commercial, industrial, and residential zones. The resultant basic pattern for all communities is seen to be (1) commercial zones at the junctures and along the main arteries of local transportation,¹ (2) industrial zones along railroads and waterways,² and (3) residential zones with their religious and educational institutions grouped around this economic framework.

These three major classes of zones are, moreover, usually found to be divided into sub-zones. The commercial zone may have retail areas, wholesale areas, banking areas, medical service areas, etc., and the residential zone invariably has exclusive and non-exclusive areas. The extent of such differentiation is dependent, by and large, on the

1. Commerce, under which term we include stores, banks, office buildings, etc., is the dominant competitor as it can pay the highest rents per unit of land. Being mainly interested in local consumers it chooses areas which are most accessible to them.

2. Industry, serving mainly a non-local public, is interested in locating along the main arteries of transportation to the outside world.

growth of a city. The encroachment of commerce on a residential zone, for example, reduces the desirability of the remaining homes for residential purposes and leads to an exodus of those who can afford to move out, followed by reduced rents and an invasion of those who can now afford to move in.

Assuming topographical uniformity and a minimum of societal interference, it has been suggested that this natural economic zoning tends to be concentric in nature:³



Zone I represents the central business district; Zone II the transition or "slum" area where business is encroaching on residential neighborhoods; Zone III the area of working men's homes; Zone IV the area of better residential homes; Zone V the commuters' or best residential zone. The industrial and minor commercial areas would, of course, have to be superimposed on this basic pattern. Since they tend to be strung out along railroads or streets they would appear as lines cutting across these concentric circles.

3. R. E. Park, E. W. Burgess and others, The City: Human Behavior in the Urban Environment, Chicago, 1925.

Since this hypothetical statement has been propounded, the ecological patterning of many cities has been studied. It has been found that although actual patterns show a rough similarity to this model, variations appear due to physiographic or special social interferences. For example, Lake Michigan limits Chicago to a series of concentric semi-circles at best, while its "packing-town" is a social factor confusing one of the residential zones. In Honolulu and Montreal topographical features (hills, and ocean or rivers) limit the possibility of pattern regularity.¹

Many ecological studies have concerned themselves with specific aspects of human affairs such as delinquency, family disorganization or suicide. Since their patterns seem related to this broad economic differentiation of the city, the ecological method gains support as a useful tool for sociological analysis.²

With this brief review of the parts of ecological theory relevant to our purposes, we may now show how it can be used to help us interpret Rochester's basic spatial patterns.

Example -- Map I.

Map I, because it is a composite of ten different social factors and hence less likely to be subject to specific disturbing elements than any of its constituents, may be expected to show the general social topography of Rochester more clearly than any of the other maps. The concentric regularity suggested above as a theoretical

1. Andrew W. Lind, Some Ecological Patterns of Community Disorganization in Honolulu, American Journal of Sociology, Vol. 36, September, 1930, p. 211.

C. A. Dawson, and W. E. Gattys, An Introduction to Sociology, New York, 1935, pp. 129-156.

2. See: Clifford R. Shaw, Delinquency Areas, Chicago, 1929.

E. R. Mowrer, Family Disorganization, Chicago, 1927, Chapter 5.

C. F. Schmid, Suicide in Minneapolis, Minnesota: 1928-32, American Journal of Sociology, Volume 39, No. 1, July, 1933.

ecological norm means that Map I would show concentric bands of red, orange, yellow, green and blue, from the center of the city outward. Inspection of the map is sufficient to demonstrate that such perfect regularity is not found. Inspection does, however, show a rough approximation to this norm. The red tracts are all contiguous to each other and occupy the center of the city except for the intrusion of orange tract 6. The orange tracts are all contiguous to the reds or to other orange tracts except for number 79. The yellow tracts are in turn contiguous to the orange or to themselves except for number 85. The greens are contiguous to the yellows or to themselves except for tract 3. And the blue tracts are in blocks at the northern, southwestern, and southeastern extremities of the city.¹ If the three green tracts on the margin between green and blue (29, 69, and 38)² had been classified as blues, the whole southern and eastern rim of the city would have been blue except for tract 36.

This rough approximation of concentricity is, however, not circular in nature. The red area is elliptical, running east and west, and the orange and yellow bands continue this elliptical pattern. Hence the western and northeastern boundaries of the city are reached by these orange and yellow bands, thus restricting the green and blue tracts to the narrow northern and broad southern areas of the city.

The interpretation of this ecological patterning must, as previous research has shown, take into consideration topographical and special social factors. The three important factors in this regard

1. Our directions in all cases are compass directions from the center of the city.

2. See Table VII.

for the history of Rochester are the falls in the Genesee River, the Erie Canal, and the New York Central Railroad. The city grew up around the available water power of the Falls, which is located between Census Tracts 2 and 6 just north of the point where the New York Central Railroad crosses the river (the railroad is shown by short parallel lines). Inspection of Map I will show that the Falls is still the geographic center of Rochester's social topography, for it is the geographic center of the red areas which are the ecological center of the city. The second important patterning factor appears to be the New York Central Railroad, a social factor representing a locally desired intrusion from the outside world. It runs roughly east and west through the city and is seen as an axis for the elliptical red areas, and for the average or below average belt intruding into the blue eastern area of the city. The canal,¹ another intruding social factor, appears as a northwest-southeast axis for the below average zone west of the river and that between Monroe and Mount Hope Avenues east of the river. Since the patterning in Map I seems to relate so well to such important topographical and social factors, it may be said to have some validity as a generalized picture of Rochester's social differentiation.

Thus we find that Rochester, as other large cities, has been moulded by unconscious social forces into a fairly predictable pattern. The logic of these forces, working within the limitations of topography and such intrusions of the outside world as Canal and Railroad has created a natural zoning of our community life.

1. The Erie Canal bed forms the boundaries between tracts 41 and 17, 25 and 2, 3, and 1, 5, and 32.

III

Ecological principles provide a basis for understanding the general and historic social patterning of the city, but do not help us answer more specific questions raised by the maps. These questions are of two kinds:

1. What specific causes underlie the patterning of any one map as a whole?
2. What specific causes underlie the unexpected irregularities of pattern found in particular Census Tracts within any one map?

The method of answering these questions is by selecting other data that one has reason to believe are causally related to the problem at hand and discovering what influence they have exerted. The determination of this influence is done by comparing the "causal" data with the "problem" data. In interpreting the Death Rate map, for example, it would seem but common sense to consult the Public Relief series (Table IV) and the Age Distribution series (Table III) because economic status and age are known to be important factors in death rates. It would not make sense, on the other hand, to consult the Boy Scout or Delinquency series.

The methods by which these "comparisons" can be made are two in number, each method having its appropriate use. If we are interested in answering our first question, "What specific causes underlie the patterning of any one map as a whole?", the most reliable procedure is to compute the coefficient of correlation between the two series of supposedly causally related data. The higher the coefficient, the more

important the cause may be assumed to be (if it is known to be independent of and hence uninfluenced by other causes). It would be impossible to keep reliably in mind the data for both the Relief and Death ratios for all 88 Census Tracts in order to make a visual comparison, whereas the statistical procedure provides an arithmetic answer that others can readily check. If, however, we are interested in the second question, "What specific causes underlie an unexpected high or low ratio in some particular Census Tract or Tracts?", the correlation method is not necessary, and, moreover, cannot be used, because of the small number of tracts involved. The interpreter can and must go to the Tables and compare the Relief and Death data without such technical help.

As we have just said, the factors that the interpreter has reason to believe are causally related to his map must be selected before correlation or other techniques can be used. Such techniques are useful simply to tell us of what importance, if any, our selected factors are in producing the result under discussion. The selection of these factors involves all degrees of difficulty, and the person who knows most about the problem is likely to make the best selection.

Example -- Map I.

1. What specific causes underlie the patterning of Map I as a whole?

The specific causal explanation of Map I is, theoretically, very much easier than that of Maps II to XI. Its causes are known (the

ten constituent social indices), and each cause should contribute 10% of the total result, thus making the computation of correlations unnecessary. Actually, the problem is not this easy. Each would contribute 10% only if each were independent of the others, but social factors are seldom independent. The "birth rate", for example, is related to "size of family". This means that the "birth rate" contributes to Map I not only directly but also indirectly through its effects on the "size of family" index. Because of such interrelationship the question of the importance of each causal factor in producing Map I must be raised as in any other map.

The coefficients of correlation between Map I and its ten constituent factors (causes) are given in Table VIII. If each cause were independent of the others these coefficients should be around 0.33 (whose square is 0.10 or 10%). Since nine of the coefficients are considerably higher than 0.33 and the tenth is considerably lower, our problem is to unravel the relationships that have produced these unexpectedly high and low values.

Table VIII. Coefficients of Correlation Between the Composite Series (Map I) and Its Ten Causal Series (Maps II to XI).*

Composite Series (Map I) and	Coefficient of Correlation (r)
Relief Series (Map II)	0.94
Delinquency Series (Map III)	0.77
S. P. C. C. Series (Map IV)	0.90
Scouts Series (Map V)	-0.78
Foreign Born Series (Map VI)	0.72
Density Series (Map VII)	0.55
Size of Family Series (Map VIII)	0.59
Birth Rate Series (Map IX)	0.49
Death Rate Series (Map X)	0.09
Tuberculosis Series (Map XI)	0.56

* The coefficient of correlation was the rank order coefficient " r_s ". The data used were those of Table V. These coefficients were then interpolated for Pearsonian "r's" by the use of a table provided for that purpose. (See H. E. Garrett, Statistics in Psychology and Education, pp. 190-192, New York, 1926.)

It would seem, on the basis of sociological knowledge and every-day experience, that the two most significant causal factors for Map I are economic status and nationality differences. Both are powerful determiners of the kind and amount of a person's or family's participation in the social life of a community, the former because it is closely associated with standards of living, and the latter because it involves group and personal adjustment to the prevailing beliefs and standards of the community.¹ Thus we should expect the Relief and Foreign-born factors, which are indices of economic status and nationality differences respectively, to underlie some or all of the other eight factors in Table VIII. That this is true is common belief among experts, and Table IX seems to verify this belief. Thus we would explain the high correlations of the Relief and Foreign-born series with the Composite series in terms of their influence on the other eight "causes", and would explain the high correlations of seven of these other eight "causes" with the Composite series in terms of the influence exerted upon them by the Relief and Foreign-born series.

Table IX. Coefficients of Correlation Showing the Relationships of the Relief and Foreign-born Series to the Eight Other Social Series Underlying Map I.

	Relief	Foreign-born
Juvenile Delinquency	0.74	0.39
S. P. C. C.	0.91	0.50
Scouts	-0.64	-0.79
Density	0.50	0.39
Size of Family	0.47	0.72
Birth Rate	0.48	0.36
Tuberculosis	0.50	0.20
Death Rate	0.22	-0.38

1. We do not mean to say that all foreign born are maladjusted to American big city life and all native born are adjusted. Everyone knows this is not so. It is accepted as true, however, that the foreign born families are living under more heterogeneous cultural conditions and tend to more maladjustment than the native group. Since it is also likely that many socially "inadequate" natives will be found living in the same Census Tracts, the foreign born population will perhaps be a fairly valid index of social adjustment in general.

The correlation between the eighth causal factor (death rate) and the composite series presents a different problem. It is considerably below the expected figure in spite of the fact that economic status is known to be one factor underlying death rates. This is explained in great part by the counterbalancing influence of age distribution. As will be remembered, we used a crude death rate -- number of deaths per 1,000 population. This means that high death rates may and do appear in Census Tracts with a young but low income population (tract 17) or with an old but above average income population (tract 29). If age had been held constant, it is our guess that the Death Rate coefficient would be similar to the Tuberculosis coefficient.

Thus it is easily seen that this statistical part of interpretation is useful but must be used with caution. Correlation is an objective and reliable measure of the degree of causality between two factors only if there is outside evidence supporting the causal relation and if they are not related to one another through third factors which might spuriously raise or lower the coefficient between them.

2. What specific causes underlie the unexpected irregularities of pattern found in particular Census Tracts of Map I?

To answer such questions the interpreter must go to the tables or draw on his general knowledge of the city for relevant causal data.

The notable exceptions to the rough patterning of Map I are tracts 3 and 85. These are both isolated from other tracts of the same color by tracts at least two colors away (green tract 3 by red tracts 1, 25 and 27, and orange tracts 4 and 65; yellow tract 85 by blue tract

86). Some explanation of these important deviations may be given.

The green rating of Tract 3 will be analyzed in some detail because of its interesting location in the below average down-town section. Table VI shows this green rating to be very deceptive. Of the ten social indices that make it up only one (death rate) is green. Its Birth Rate, Size of Family, Foreign-born, and Scouts indices are blue; its Relief, S. P. C. C., and Density indices are yellow; and its Tuberculosis and Juvenile Delinquency indices are red. This discovery takes us to Table V to see the exact rankings of tract 3 for these factors. Here we find that it has the lowest Size of Family, lowest Foreign-born Population, and second lowest Birth Rate of all 88 tracts, and the second highest Tuberculosis rate and third highest Delinquency Rate of all 88 tracts. These evidences of heterogeneity are sufficient to take us to the other tables for information not included in the maps. In Table I we discover that tract 3 has 722 Negroes, the largest concentration of Negroes of any tract in the city. They constitute 23% of its population. Another 10% of the population is foreign-born. In Table II we discover a normal sex distribution for this tract, but in Table III we find that it has much smaller percentages of people under 15 and over 64 than the city as a whole and, consequently, a much larger percentage of people between 15 and 64. From such data we can draw tentative inferences to explain the heterogeneous social picture of the tract. For example, it has an average city Relief rate (8% of its families) in spite of its large Negro population, thus suggesting that the native white population (66%) is predominantly a non-relief group.

Similarly the 33% Negro and Foreign population, and the favorable sex and age distribution of the whole tract, would lead one to predict a high birth rate. Its "lowest in the city" birth rating would suggest the conclusion that the native white population is made up predominantly of single people or childless marriages. The large number of apartments and rooming-houses in this tract would seem to verify this inference. Thus a high relief rate among the Negro and foreign populations, combined with a very low rate among the native whites, would explain the average relief rating of tract 3, while a high delinquency rate among these poorer segments of the population would not be similarly reduced by the native whites because they have so few children. The strangely different ratings of tract 3 for various social indices would, therefore, be the result of a large number of low income, Negro, and foreign families and a higher income, native-white, childless population. Whether this explanation, worked out entirely from the tables, is reliable or not can only be answered by more specific tabular material or intimate knowledge of the area. Our interest here is in the way the tables can and must be used to help answer specific questions arising from the maps.

In the case of tract 85, although its westward spur is a very high class residential neighborhood along the lakeshore, the rest of the tract contains the Port of Rochester and the formerly independent town of Charlotte. A glance at Tables I to VI will show the consistently "average" classification of this tract for all population and social indices except population density. It is not unlikely, however, that

these "average" scores are simply the product of the low and high ratios of the two parts of this heterogeneous tract.

The interpretation of Map I has been given in segments to fit in with our description of what interpretation involves. We shall now exemplify ecological interpretation with reference to Map III without such textual interruptions.

Interpretation of Map III (Juvenile Delinquency)

I. Data and Method Underlying Map III (All the material in this section can be found in Chapter 1.)

Map III concerns male juvenile delinquents under 16 years of age whose names were recorded by the Monroe County Court during the years 1928 to 1937 inclusive. These cases were classified by Census Tracts, giving the total number of adjudicated delinquents in each tract during this period. Knowing this and the total boy population of each tract, it was a simple matter to determine the percentage of the boy population that was adjudicated delinquent in each case. These ratios are, however, extremely abstract, as we pointed out in Chapter 1. They are not annual delinquency rates, nor ten year rates, but simply ratios providing the researcher with a uniform measure for comparing one tract with another. These comparisons should rank the tracts in approximately the same order as if annual or ten-year rates could have been used.

In interpreting any map that concerns recorded cases of a private or public agency, it is well to acquaint oneself with the regulations of the agency and other factors which may select the cases or determine their disposition. In the case of Map III we are dealing

with court cases of delinquency. How adequately this official record mirrors male juvenile delinquency in the community is an important question. The map tells us simply what areas have higher or lower percentages of their boys accused and convicted of some delinquency than other areas. Part of this may be due to the higher incidence of police in congested downtown areas, or to the possibility that delinquencies in a better residential area are handled by adults (or permitted to be handled by the police) more as family matters than as court matters.¹ At any rate one cannot interpret the map as a self-evident picture of the differential unlawfulness of Rochester's children.²

II. Existing Interpretations of Similar Ecological Studies

The important studies for our purposes here are Map I, which gives Rochester's general spatial patterns, and such specific studies of delinquency as Dr. Clifford Shaw's for Chicago.

A comparison of Maps I and III (see Tables V or VI) shows some important differences, even though the coefficient of correlation between their rank order series is 0.77. The chief of these may be summarized as follows: the higher delinquency areas appear to be located farther south and east on the one hand, and farther northwest on the other, than would be expected on the basis of Map I. A close analysis of the rankings in Table V will show that most tracts east of the river and north of a line formed by Main, Webster and Bay Streets³

1. Most delinquency charges concern petty larceny or burglary (53% between 1929 and 1933, and 66% in 1934, according to studies made by Herman S. Alpert and Ruth Yalowich for Professor Fry.).

2. There is some disposition to feel that delinquency cannot, at present, be adequately measured.

3. This line approximates the southern boundaries of tracts 6, 11, 45, 56, and 54.

tend to have more favorable delinquency than composite (Map I) ratings, whereas the tracts east of the river but south of this line tend to have less favorable delinquency than composite ratings. Of the 29 tracts in the former group, 21 have delinquency ratings more than 3 ranks lower than their composite ratings, while only 3 have delinquency ratings more than 3 ranks higher. Of the 22 tracts in the latter group, only 5 have delinquency ratings more than 3 ranks lower than their composite ratings while 15 have the reverse. West of the river the dividing line is about Emerson Street. Those tracts north of this line¹ tend, by and large, to have higher delinquency rates than would be expected on the basis of Map I, while the tracts south of this line have the reverse. This division can, as in the case of the tracts east of the river, be seen best with the assistance of Table V. North of Emerson Street 6 of the 10 tracts have delinquency ratings more than 3 ranks higher than their composite ratings; south of this dividing line there are only 6 tracts out of 27 in this category, while 16 have ratings at least 3 ranks below their composite ratings. An interesting observation about this area south of Emerson is that most of the better than expected delinquency tracts are between Emerson and Main Street, rather than south of Main Street.

These pattern differences, and their orderliness, demand more specific investigation than we can give here. Certain points of interest may, however, be mentioned. Ecological theory has suggested the importance of transportation channels, and we have seen the pertinence of the railroad and possibly the old Erie Canal for Rochester's

1. Tracts 88, 24, 23 and those north of them.

general patterning. The high delinquency areas of Map III show even closer correspondence to these basic patterning forces. The subway-canal seems to form the axis of the red and orange belt running from Edgerton Park to the area between Monroe and Mount Hope Avenues, while the main line of the New York Central not only continues to form the east-west axis of the orange and red areas in the center of the city as expected, but the axis of the unexpectedly high delinquency area running southeast to the city-line. Since these transportation channels are or were chiefly of significance in determining the basic economic patterns of Rochester, it would seem that adjudicated delinquency must be highly related to economic status.

Delinquency studies such as that of Dr. Clifford Shaw have tended to show substantial correlations between delinquency and various indices of economic inadequacy or cultural heterogeneity. For example, he found positive correlations in Chicago between delinquency and such indices as family dependency and the foreign-born, and negative correlations between delinquency and such other indices as home ownership.¹

III. Specific Causal Factors Underlying Map III

(1) Specific Causes Underlying Map III as a Whole

Of our ten social indices only Relief, Scouts, Foreign-born, Density, Size of Family and Tuberculosis can be defended as possible causal factors. The correlations between delinquency and these are:

1. The reader is referred to Shaw's Delinquency Areas, and to his summary of delinquency studies in "Social Factors in Juvenile Delinquency," National Commission on Law Observance and Enforcement, Report on the Causes of Crime, Washington, 1931, No. 13, Vol. II (with Henry D. McKay).

Delinquency and Relief		0.74
"	" Tuberculosis	0.53
"	" Boy Scouts	-0.43
"	" Foreign-born	0.39
"	" Density	0.30
"	" Size of Family	0.18

Thus delinquency correlates highest with economic status, verifying our inference from the spatial patterning of the map itself. The correlation with our second basic variable, foreign-born, is not striking and the probable error ($\pm .07$) might reduce it considerably farther. However, specific studies made by Mr. Herman Alpert and Miss Ruth Yalowich as student research projects show a higher correlation. Alpert finds that 948 of the 1,033 boy delinquents 1929-1933 had at least one foreign-born parent, while Yalowich finds 67% of the 1933-34 delinquents had foreign-born parents. In both cases the Italian group, a recent immigrant group, accounted for a good share of this "second generation" delinquency, thus supporting the position that cultural maladjustment is an important factor in such activity.

The remaining four possible causes are related to the relief and foreign-born variables, as shown in Table IX, hence their correlation with delinquency may merely mirror these relationships. Public Relief, for example, correlates 0.50 with Tuberculosis incidence, -0.64 with Scout membership, and 0.50 with Density, while the Foreign-born series is correlated -0.79 with Scout membership, and 0.72 with Size of Family. Thus Boy Scouts must be more prevalent in native-born and low relief areas where delinquency is low than they are in high relief or foreign-born areas where delinquency is high. Hence the negative correlation between Scouts and delinquency does not necessarily mean that

Scouts are insurance against delinquency; it may simply mean that they are weighted towards areas less likely to contain delinquents.¹ Child health, as measured by the Tuberculosis rate, may be a contributing factor to delinquency, although its relationship to economic status obscures the exact amount, but Density and Size of Family seem of negligible importance on the basis of the correlations.

Additional causes of delinquency such as broken homes or neurotic parents may be of considerable importance, but we have no data at present upon which to estimate this importance.

(2) Specific causes underlying Census Tract irregularities in Map III.

The striking irregularities in Map III, in terms of what would be expected from rankings in Map I, are:

Tract 3, 57	2	rank	higher	(worse)	in	delinquency	than	in	composite
score.									
Tract 77, 52	"	"	"	"	"	"	"	"	"
score.									
Tract 61, 46	"	"	"	"	"	"	"	"	"
score.									
Tract 46, 32	"	"	"	"	"	"	"	"	"
score.									
Tract 30, 31	"	"	"	"	"	"	"	"	"
score.									
Tract 74, 56		rank	lower	(better)	in	delinquency	than	in	composite
score.									
Tract 26, 33	"	"	"	"	"	"	"	"	"
Score.									
Tract 43, 33	"	"	"	"	"	"	"	"	"
score.									
Tract 44, 28	"	"	"	"	"	"	"	"	"
score.									

These deviations, and many lesser ones, should be subjected to intensive study. Our present data are inadequate for this task, but

1. This is no criticism of the Scout organization as this differential distribution may be largely due to such factors as differential community wealth and leadership to support scouting activity.

2. For these differences of ranking see Table V.

a few observations can be made. In only one of the higher than expected delinquency tracts (number 3) is there a real reason on the surface of things. Tract 3, as we pointed out above, is an under-privileged Negro area. Three of the other four areas are on the outskirts of the city and the fourth is the tract between Monroe and Clinton Avenues that contains both Monroe High School and the Monroe Y.M.C.A. None of these four have noticeably deviant characteristics as seen in Tables I to IV.

Of the lower than expected delinquency tracts 44 contains the Lewis Street Settlement House and 43 is the next-door tract. The other two, numbers 74 and 26, are parts of a section (74, 26, 25, 72) that is much below expectation even though it has a high Public Relief population and has from 17% to 37% of its families of foreign stock.

Besides these deviant tracts, it is important to examine the tracts with the highest delinquency rates. Tract 1, the first ward, has a rate (33.3%) which is almost twice as high as any other tract and almost 10 times as high as the city average. Tract 5 has a rate (18.5%) over 5 times as high as the city average, and Tract 3 has one (13.3%) almost 4 times as high. Tract 9 follows with 10.2%. The city average of 3.6% sets these tracts off in startling relief, particularly since the Central Y.M.C.A. and the J.Y.M. & W.A. are in Tract 9 and Columbus Civic Center is in Tract 5, the three leading religious character-building agencies. Since Tract 3 has been adequately discussed above, we shall confine our discussion to the others. Tract 1 is found to have a sex ratio of almost 3 males to one female (Table II),

more than 50% of its population over 45 years of age (Table III), and much the highest Relief and Tuberculosis rates in the city. (Its Relief and Tuberculosis rates are over 4 times the average for the city.) These are, of course, marks of a highly abnormal area, and the delinquency rate shows that such an area, in spite of its below average density and foreign-born population, is incapable of handling even its low child population (6.4% under 15 years of age as against a city average of 24.1%). A high S.P.C.C. rating verifies this. Moreover, the low birth rate of this tract (tenth lowest, Table V) along with its very large average size of family (largest of all tracts, Table V) shows that each "family" must include a number of roomers or adult relatives, in itself a none too satisfactory environment for children.

Tracts 5 and 9 have normal sex ratios and below average numbers of foreign-born population, but abnormally old populations with low birth rates, higher than average density and percentages of families on public relief, and very high tuberculosis ratings (see Tables II, III and V). The inadequacy of these areas for their small percentages of children is verified by the high S.P.C.C. activity in them.

Thus we find that the tables provide us with basic population and social data, by which we can gain some insight into the area under study. These facts are, of course, not adequate to give determinate answers to our questions, but they provide the necessary backdrop for more intensive study.

With this analysis of what interpretation of ecological studies involves, and with two examples (Maps I and III) as illustrations, we hope that the reader will now find himself able to participate in the quest for reliable answers to problems raised by this social research technique. As a final aid, however, we shall list certain basic coefficients of correlation for Section III of the interpretation of Maps II to XI. We do not claim that the listed factors are proven specific causes of the map in question, but merely suggest that they are the most logical choices of those factors at our disposal. Coefficients between 0 and $\pm .40$ should be used cautiously.

Map II (Families on Public Relief)

Correlations (r) between Families on Public Relief and the following possible causal factors:

Foreign-born	0.56
Size of Family	0.47
Birth Rate	0.48
Death Rate	0.22
Tuberculosis	0.50

These factors are, of course, quite subordinate to unemployment resulting from lack of working opportunity.

Map III (Juvenile Delinquency)

Correlations (r) between Juvenile Delinquency and the following possible causal factors:

Public Relief	0.74
Boy Scouts	-0.43
Foreign-born	0.39
Density	0.30
Size of Family	0.18
Tuberculosis	0.53

Map IV (Protective Department, S.P.C.C.)

Correlations (r) between S.P.C.C. and the following possible causal factors:

Public Relief	0.91
Juvenile Delinquency	0.80
Boy Scouts	-0.61
Foreign-born	0.50
Density	0.40
Size of Family	0.37
Death Rate	0.21
Tuberculosis	0.49

Map V (Boy Scouts)

Correlations (r) between Boy Scouts and the following possible causal factors:

Public Relief	-0.64
Foreign-born	-0.79
Density	-0.43
Size of Family	-0.66
Tuberculosis	-0.24

Map VI (Foreign-born) None

Map VII (Density)

Correlations (r) between Density and the following possible causal factors:

Public Relief	0.50
Size of Family	0.14
Birth Rate	0.05

The low correlation with Birth Rate means that the residential shifting of existing population is much more important for density than is the production of new population.

Map VIII (Size of Families)

Correlations (r) between Size of Families and the following possible causal factors:

Foreign-born	0.72
Birth rate	0.42

Map IX (Birth Rate)

Correlations (r) between Birth Rate and the following possible causal factor:

Foreign-born	0.36
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Map X (Death Rate)

Correlations (r) between Death Rate and the following possible causal factors:

Public Relief	0.22
Foreign-born	-0.38
Density	0.08
Size of Family	-0.44
Tuberculosis	0.23

Map XI (Tuberculosis)

Correlations (r) between Tuberculosis Rate and the following possible causal factors:

Public Relief	0.50
Foreign-born	0.20
Density	0.16
Size of Family	0.21

Chapter 4

Ecological Maps

Included in this Chapter are the following maps:

- Map I Composite of Ten Social Indices, Rochester,
New York, 1928-1938.
- Map II Families on Public Relief, November 1-15, 1936.
- Map III Juvenile Delinquency - Adjudicated Cases -
Boys, 1928-1937.
- Map IV Families under Care of Protective Department,
S.P.C.C., 1931-1936.
- Map V Boy Scouts - Including Cubs, January 1, 1938.
- Map VI Foreign Born, 1930.
- Map VII Density of Population, 1930.
- Map VIII Size of Families, 1930.
- Map IX Average Birth Rate, 1933-1935.
- Map X Average Crude Death Rate, 1933-1935.
- Map XI New Tuberculosis Cases, 1934-1937.