THE ORGANIZATION OF THE AMERICAN CITY IN THE LATE 19TH CENTURY: ETHNIC STRUCTURE AND SPATIAL ARRANGEMENT IN DETROIT*

by

Olivier Zunz

Paper written for a special issue of the Journal of Urban History, "Immigrants and Workers in European and American Cities," O. Zunz, ed., to appear in 1977.

CRSO Working Paper #139
August, 1976

Copies available through:
The Center for Research on
Social Organization
University of Michigan
330 Packard Street #214
Ann Arbor, MI 48109

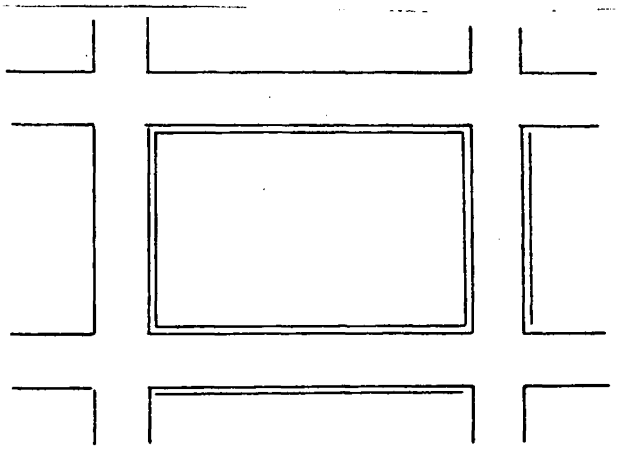
Immigrants to American cities have generally been portrayed as initially clustering into ethnic neighborhoods and then dispersing throughout the city as their occupation, educational level and family composition come to resemble those of the city population as a whole. Contradictory historical evidence has called into question the validity of this model for the 19th century. A number of social historians of the last decade, following Sam Warner's lead, contended that "most foreign immigrant to American cities never lived in ghettos... (if a ghetto be defined as a place inhabited almost exclusively by one ethnic group)."[1] This reasoning could lead us to the extreme position of arguing that the spatial arrangement of the 19th century American city was not profoundly affected by the ethnic character of the new population. Thus the rich sociological image of the city divided into physical zones, each of them representing a step in the assimilation process of immigrants, looses much of its evocative power.[2]

Should we then treat the organization of the American city independently of the general process of assimilation into American society? The powerful literary image of the ethnic ghetto, deeply anchored in American thought, has its roots in a handful of examples of extreme concentrations of immigrants, like David Levinsky's lower east side.[3] On the other hand, only a few case studies, using census data aggregated at the ward level--usually very large areas--and a single statistical technique, the index of dissimilarity, have led several historians to claim that residential mixture was the rule.[4] Much more needs to be done in terms of conceptualization, definitions of units of analysis and measurement techniques before arriving at such a conclusion.

The purpose of this essay is to study the spatial organization of Detroit in the late 19th century in relation to the process of assimilation in American society. To see whether cohesive neighborhoods existed, we examined land use patterns, the residential distribution of socio-ethnic groups, and demographic characteristics of the population in numerous small areas sampled across the city. We found that in late 19th century Detroit, a middle size city of the midwest, away from the spectacular immigrant crowding of the eastern seaboard city, the territorial divisions that existed reflected important ethnic and class divisions. Our analysis follows three steps: first, dividing the city into a coherent set of physical areas; second, examining residential patterns; and third, analyzing fertility patterns, since demographic differences may indicate further differentiation among areas of the city. We ask if people who lived in geographic proximity shared none, only one or perhaps several common characteristics, and whether the confluence of these characteristics created distinct urban areas.

The Sample

For practical purposes, the investigation is limited to a multi-dimensional analysis of land use characteristics, socio-ethnic cleavages, and demographic behavior for 127 sampled areal units. Each of these 127 sample units is made up of one primary block and of two adjacent opposing fronts.



These 127 units were drawn from all areas of the city, stratified by types of land uses in the primary block (residential, non-residential, vacant, and mixed).[5] The sample permits observations across the entire urban territory. Each sampled units is small enough for individual-level

[See Map 1]

observations of people, houses, and activities, yet large enough to capture ethnic or socio-economic clustering.

The mean number of inhabitants per inhabited unit of six fronts was 117 (minimum 3, maximum 412), the mean number of inhabitants per primary block was 82 (minimum 3, maximum 292), and the mean number of inhabitants per front was 33 (minimum 1, maximum 152). The addition to the primary block of two randomly selected adjacent opposing fronts permits us to represent both sides of streets without including all opposing fronts. We thus get a better picture of neighborhood composition than would be rendered by a block alone. Altogether the sample includes 12,185 people or 10.47% of the city's population in 127 units or 8.25% of the primary blocks augmented by the adjacent fronts. Socio-ethnic and demographic information were recorded on all the inhabitants of the sampled units from the 1880 Federal Census Schedules.[6] The land use characteristics of each block front were coded from the 1885 Robinson-Gidgeon Atlas of the City of Detroit and the 1880 city directory.[7] The sample accurately represents both the city's population and land use pattern. To be sure there are many holes in the map. It may be that non sampled areas were very different from the sampled areas and that important concentrations were missed. Yet it is unlikely. The sampling was loose only in the vacant parts of the city, but quite intensive in the densely populated areas. The design permits us to represent geographic clustering in small

neighborhoods, so as to study how various categories of people were collected in the urban environment and the forms and intensities of their clustering; and to represent the interplay between population characteristics and land use patterns.

Analyzing Detroit in 1880

Picture Detroit in the year 1880.[8] It was the eighteenth largest American city in population, but still medium sized with 116,340 inhabitants. It had ceased to be the small-scale commercial city of the 1850's, but it had not yet become the giant industrial metropolis of large industrial zones and neat patterns of residential segregation.[9] Detroit in 1880 was spatially small. The distance from the river in the south to the northern boundary was only 3.5 miles along Woodward Avenue. The declining curve of population density from the center to the periphery shows that space within the city was only half used. Up to the 1.3-mile limit, the city was relatively dense (60 people/acre); beyond this distance, there was a dramatic decline of density.[10] The used area was itself

[See Graph 1]

divided. Most of the non-residential activities, as well as the non-familial types of residences, such as hotels and boarding houses, were concentrated in the center of the city. This central area was surrounded by a primarily residential zone. Beyond this residential zone was the unused city, a very large, low-density zone with many vacant spaces. Suburban settlement did not exist (see Map 1).

By 1880, the great industrial changes that transformed American cities at the turn of the century had only started in Detroit. The city's industries that counted more than 1000 employees were clothing, lumber,

tobacco, and food, as well as transportation and iron and steel. The smelting industry was in a narrow strip along the river and in a small northwest sector at the intersection of the Michigan Central Railroad and the Grand Trunk Railroad.

Similarly, the great demographic changes were only beginning. The city was populated mainly by Yankees and members of older immigrant groups, including Canadians, English, Irish, and Germans. The Poles had started to move in only recently. Very few people from other ethnic groups lived in Detroit; only 2.42% of the population was black.

[See Table 1]

[See Table 2]

How was the urban territory socially divided? Were there well defined neighborhoods that can be identified and circumscribed? Though medium in size, this midwestern city presented a diversified environment, a differentiated land-use pattern and an ethnically heterogeneous population. One can visualize the grid of Detroit--or of any other grid city--as a quilt with a few primary colors and many shades. The areas of primary colors are inhabited by people who are similar enough across a series of variables to give an area a distinct tone. An example of a "primary color" area would be a typical "German" neighborhood of the nineteenth century, in which many heads of households were craftsmen living in homes inhabited by families with a large number of young children. Another example would be a typical "low white collar" neighborhood, inhabited primarily by Americans of the second or third generation, with medium size families, and with households often extended by the presence of one or several servants and/or boarders. Each of these areas would reflect a crystallization of socio-economic, ethnic,

and demographic characteristics. They would be the primary colors of the urban quilt. Other areas of the city would have a variety of less distinct shades. For example, a small area might be characteristic of an age group but would not reflect any strong social and/or ethnic clustering. Other areas might be integrated. Which areas of the city qualified for the primary colors of the quilt in 1880 Detroit, and which for the many intermediate shades? An answer to this question tells us how and to what degree spatial clusters in the urban environment reflected social divisions.

Even in theory, it is not a simple matter to identify social clusters and to evaluate the degree to which they reflect social divisions. The urban territory is not a fixed entity. It is composed of both physical and social elements that change simultaneously. Two different histories occur, following different impulses with different rhythms. On the one hand the city's physical structure changes as a result of economic and technological transformations. On the other hand the social fabric follows the waves of migration in and out of the city. The urban form is a product of these two different but related histories. For example, a change in density pattern in one area might reflect transformations in the technology of housing, shifts in the population distribution of the larger urban territory, change in the ethnic composition of the area, or some combination of these factors. American cities--Detroit among them--witnessed four well-known transformations from the 1870's to the 1920's: 1) Cities became bigger and more densely populated, with more diversified populations; 2) The manufacture of industrial goods grew tremendously, as did the amount and types of services provided; 3) Government and community organization changed from relatively

simple to more complex structures; 4) And above all, cities became the prime locus of assimilation in American society. In this process, which was just beginning in Detroit during the late 19th century, the physical and social elements that made the urban territory were shuffled. It is therefore important--while analyzing a city--to dissociate or at least to locate social space within urban space.

For purposes of analysis, I will differentiate between: a) primarily residential units; b) units occupied primarily by non-residential activities, more or less intermingled with residences and c) vacant space, the under-used areas of the city, also more or less intermingled with residences. Knowing the respective importance of these three types of spaces in 1880 Detroit, and how they fitted together, enables one to assess the significance of clustering patterns. For instance, the presence in 1880 Detroit of a very large unused zone indicates that even if the city was geographically expanding in the nineteenth century, there was little need to search for space elsewhere than in the city itself. Only in the 1900's does the city's population grow dense subsequent to massive immigration but prior to massive suburbanization. Thus if our model of an ethnic neighborhood were the Lower East Side of New York in 1900, with a world record in density of 900 people/per acre, we would probably misread the degree of ethnic clustering in a city like 1880-Detroit, where the maximum density was only 80 people per acre.[11]

Land-Use Variables

Two land-use variables were selected for this analysis: the diversity of non-residential activities, and the amount of vacant space per sampled unit. These variables permit us to locate each sample unit in the texture of the late nineteenth century city. They indicate with

some accuracy whether the land-use of an area is of the "central" type, a peripheral type, or a mixed type found very often in residential areas. The analysis focuses on the diversity of activities in an area rather than on the dominant type of activities or on the numerical concentration of activities. The chief characteristic of the "central" type is the accumulation and juxtaposition on block fronts of industries, crafts, wholesale and retail outlets, professional and public services, and hotels and residences. Thus the sampled units that contained boarding houses and hotels were all located in the city center and also contained 42% of the heavy industry, 80% of the light industry, 68% of the crafts shops, 95% of the wholesale, 57% of the retail stores, 60% of the bars and saloons, 97% of the business, 68% of the professional offices, 75% of the public services, 42% of the churches and 50% of the parks and recreation lots recorded in the sample. The second land-use variable--

[See Map 1* and 2]

vacant land--points to an opposite pattern: peripheral location rather than centrality, zone of development rather than a zone already filled. A sample unit of six fronts with several fronts having vacant lots was likely to be located in the low-density areas of the periphery, with new inhabitants and few activities.

A high score on either of these two land-use variables indicates the two extremes to be found in the physical environment of Detroit in 1880: an enormous diversity of activities in the same place, or almost complete absence of both people and activities. High values on these variables correspond also with extreme demographic types: vacancy on the one hand, skewed population distribution on the other. Since the highly diverse fronts contained--among other things--the hotels and

*Map 1: units with more than 5 types of non-residential activities and vacant units.

boarding houses of the city, over 60% of their population was made up of males aged 17 to 40 years old. The downtown area was dense and diversified but inhabited in part by an unusually young population.

Family residences are to be found elsewhere, in units that rate low and medium on the two land use variables that we selected. Residences existed in all parts of the city, even intermingled with industrial activities and spread in the vacant areas. But a large concentric zone around the center and within the vacant periphery constituted the main residential zone. Despite its uniformity on our two land use variables, this large residential zone was by no mean uniform or undifferentiated. Wooden houses dominated the east and west sides while about half of the houses in the center, around Woodward avenue were made of bricks. And stables were built next to these houses. The east side counted many craft shops, small unnumbered buildings on the back or the side of the houses. Yet all over Detroit, most houses contained only one household, usually five to six persons, except for a strip of multiple dwellings on the near east side, in the so-called Kentucky area.[12]

Socio-Ethnic Concentration

Two other variables capture residential clustering on the basis of ethnicity and occupational status.

Ethnic and occupational concentration patterns in the city have been analyzed in a previous study.[13] In this earlier study, the geographic distribution of the heads of households of the six main ethnic groups--Americans (white Americans born in the U.S. with two parents born in the U.S.), and immigrants from Canada, England, Ireland, Germany and Poland--and of four large occupational status categories (high white collar,low white collar, skilled, and unskilled) were examined.[14]

[See Table 3]

[See Table 4]

The findings may be summarized in three general observations. First, there was a strong pattern of ethnic clustering in 1880 Detroit, especially in areas inhabited by four groups: American, Irish, Germans and Poles; 30 to 60% of their populations were clustered in one area. Thirty seven percent of the "American" families lived in the upper center, along Woodward Avenue. Forty percent of the Irish families in the city lived in the Irish West Side, or Corktown. Fifty two percent of the German families lived in the East Side, as did most of the Poles. The Near East Side also had a strong mix of immigrants from Austria, Belgium, the Netherlands, Luxembourg, Switzerland and France as well as the small black population of Detroit. Elsewhere the city was more Anglo-saxon and Celtic, with the Irish on the West. Little ethnic concentration existed for English and Canadian immigrants.

[See Map 3]

Second, there also existed a strong pattern of occupational clustering, especially seen in areas inhabited by low white collars in the near center, and by skilled craftsmen on the East Side. Ethnic

[See Map 4]

concentration however was numerically and spatially more important than occupational concentration. Despite some important interaction between occupation and ethnicity, such as German skilled craftsmen or American low white collars, areas of high ethnic concentration counted all types of occupations, while areas of high occupational clustering, especially among low white collars, were inhabited by many different national groups.

Finally, both the more heavily populated and diversified center areas and the peripheral vacant areas showed remarkably little ethnic or occupational residential concentration.

Marital Fertility

Marital fertility is the fifth and last variable in this multivariance analysis. Ethnic origin and occupational status level are structural variables which only suggest behavioral differences. Fertility, on the other hand, directly reflects fundamental behavioral differences between groups in the society. As Hauser and Kitagawa wrote, "Differential fertility may be viewed as an important measure of the extent to which a society is homogeneous, integrated or pluralistic, static or experiencing social change."[15] In addition, among demographic variables, patterns of fertility best reflect the socio-spatial divisions of the city. Of course there existed aggregate differences between ethnic and socio-economic groups on variables such as household and family composition and size, or percentage of female-headed families. These differences, however, were not as sharp as differences in fertility, nor do they display as clear a spatial pattern. Even in ethnically homogeneous neighborhoods, there was a great diversity in household structure (nuclear, extended) according to the stage of the life cycle of the household head. Marital fertility is a better indicator of whether families who lived in geographic proximity on the basis of ethnicity or occupational level shared similar demographic behavior.

Marital fertility was measured as the age specific standardized child/women ratio per 1000 women with husband present aged 20-49 and children under 5 years old. Important fertility differentials existed between ethnic and occupational groups, consistent with those found

in other studies.[16] The highest marital fertility rates were recorded for Poles and Germans, and for unskilled workers. These important

[See Table 5]

differentials were reflected in the geography of the city. On the map of the sample, the fertility display corresponds rather well to the ethnic display. High fertility for Canadians blurs the picture a little,

[See Map 5]

because Canadians were not heavily clustered on the basis of ethnicity.

Cluster Analysis

We can now proceed to examine land use, socio-ethnic and demographic variables together rather than independently, in order to see whether homogeneous clusters existed in the urban environment of the late 19th century. In other words, where were the primary colors of the urban quilt of Detroit in 1880?

A cluster analysis was used to group similar sample units.[17] Each sampled unit received a value on the five variables included in the analysis: the ranges of these values were: 1) from 0 to 10 different types of non-residential activities; 2) from 0 to 6 fronts with vacant lots; 3) an index value per unit for ethnic clustering or 4) an index value for occupational clustering;[18] 5) from 0 to 1875 children under five per 1000 married women. The range of these variables was then reduced by categorizing them into two or three classes, two for ethnic and occupational clustering (with or without), and three classes (low, medium, high) for the other three variables--non-residential activities, vacancy, and fertility. The units were then classified

[See Table 6]

according to their similarity across the 5 variables; that is, we computed the euclidean distance, which would be zero if the units were strictly similar on the multidimensional scale. For example, all units ranging high in the number of non-residential activities, low in the amount of vacant land, positive on ethnic and occupational clustering and, say, low on the fertility measure would be clustered together because they were similar. To compute the euclidean distance $d(j,j')=\sqrt{\sum_{i=1}^{p} wi^* (vij-vij')^2}$, where vij is the value taken by the j^{th} unit on the i^{th} variable with weight wi* the variables were once again transformed into a series of dummy variables and weighted to balance equally land-use pattern, socio-ethnic clustering, and demographic behavior. To interpret the result, we examined the characteristics of the groups of units that had been lumped together in this cluster analysis. For the units that were rated positive on the ethnic and/or occupational concentration variables, we completed our information by looking at the dominant ethnic and occupational status group (or the two dominant groups if none counted more than 50% of the families) in each unit. The result of the clustering analysis was to classify the sampled units into six main groups that we can define geographically.[19]

1) <u>The Central Type</u>: 13 units - 1579 inhabitants (13% of sampled inhabitants)

Many different types of non-residential activities (Mean of 5.7 types of activities)	No vacant land (mean of .23 fronts per unit of 6 fronts with vacant land)	No ethnic concentration	No occupational concentration except for 5 high and low white collar units	Low fertility (Mean of 315 children under 5 years old per 1000 married women)

2) The Residential Center Type: Center up and River - 19 units - 2647 inhabitants (21.7% of sampled inhabitants)

Rate low or medium in activities (Mean of 2.7 types of activities)	From no vacant land to some vacant land (Mean of 1.3 fronts per unit with vacant land)	American and English (8 units without clustering)	High and low white collars (2 units without clustering)	Low and medium fertility (Mean of 514 children under 5 years old per 1000 married women)

3) The East Side Type: 18 units - 3793 inhabitants (31.1% of sampled inhabitants)

Rate low or medium in activities (Mean of 1.9 types of activities)	From no vacant land to some vacant land (Mean of 1.8 front per unit with vacant land)	Mainly Germans and some Poles in the upper area	Mainly skilled and unskilled	High fertility (Mean of 953 children under 5 years old per 1000 married women)

4) The West Side Type: 8 units - 1404 people (11.5% of sampled inhabitants)

Medium in diversity (Mean of 1.25 types of activities)	From no vacant land to some vacant land (Mean of 1 front with vacant land per unit)	Irish	Skilled and unskilled	High fertility (Mean of 854 children under 5 years old per 1000 married women)

5) Background/Peripheral Type: 44 units - 2754 people (22.6% of sampled inhabitants)

Low in diversity (Mean of 1 type of activity per unit)	Medium to high in vacant land (Mean of 3.04 fronts per unit)	No ethnic concentration	No occupational concentration	Medium fertility (Mean of 567 children under 5 years old per 1000 married women)

6) Vacant Units: 23 uninhabited units plus two units not included[20]

[See Map 6]

Several conclusions can be derived from this cluster analysis. First, far from being spatially integrated, this medium size midwestern city was territorially divided. Seventy seven percent of the population lived in one of the four primary colors, the four types that were represented either in the center, the upper center or sections of the east and west sides of the city. These areas make up less than half the sampled units but included more than 2/3 of their population in 1880 Detroit. The 44 units in the background/peripheral category, 34% of the sampled units, accounted only for 22% of the population.

Second, different group characteristics were reflected in these different areas. All the aggregate characteristics of Germans, Poles, Irish were reproduced at the neighborhood level. They tended to crystallize in each unit showing a high degree of geographic cohesiveness. The Yankees also appeared to have had a high degree of cohesiveness in the near center. Canadians and English were more dispersed and their aggregate characteristics less crystallized in the micro environment. The distance between the three main immigrant groups-- Irish, Germans and Poles-- and the Americans was significant. Canadians, coming into Detroit from the nearby country across the river, and the English essentially low white collar immigrants, were more easily integrated into the various parts of the city.

These territorial types showed distinct differences in land uses, ethnic and occupational structures, and fertility patterns. The two areas that showed remarkably little socio-ethnic concentration were the dense city center, which contained many different activities, and the relatively vacant periphery. They were both demographically incomplete areas, one almost empty, the other full but inhabited by an unusually

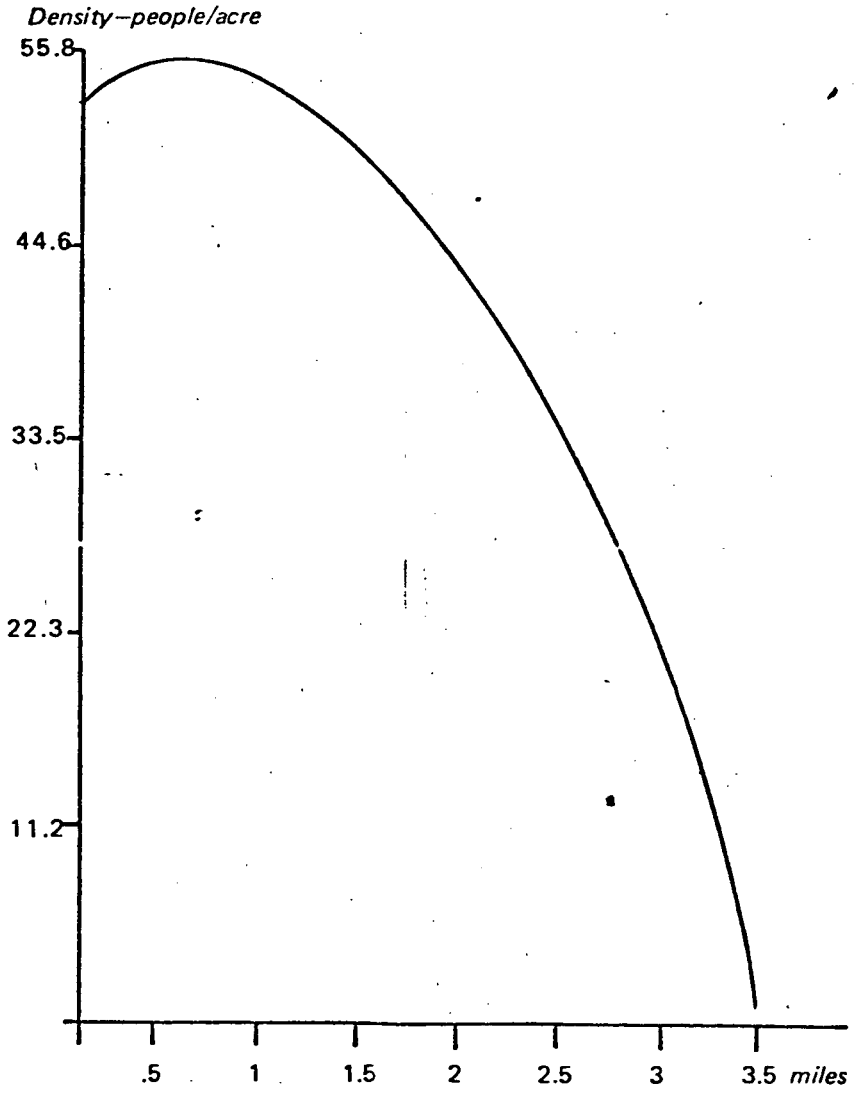
large number of young male bachelors. It would be fascinating to explore further each of these neighborhoods, but an in-depth study of the interaction of people and activities within each of them is beyond the scope of this essay. Its limited goal was to assess the existence of the primary colors that served as reference points to the overall ethnic community. Urban historians, while challenging the ghetto interpretation of American history, substituted for it a model of juxtaposition and intermingling of people and activities that was characteristic of only some areas. In Detroit, their conclusion would apply to the central and peripheral types but not to the residential areas, in which significant territorial divisions existed. To be sure they were not immediately noticeable because of the generally low population density.

For the ethnic factor to be significant in the urban environment there need not be either areas exclusively inhabited by one group or all members of an ethnic community living in an ethnic neighborhood. Such complete segregation has only been experienced by Blacks in American cities. Then the questions should be: What proportion of the group should be spatially concentrated to consider the ethnic factor as significant? What should the geographic intensity be? And how much cultural cohesiveness must one find? Fourty to 52 percent of one group in one area (such as the Irish and the Germans of Detroit) seems enormous to me if one thinks of the many other factors that play a part in urban location. Fertility is only one indicator of cultural cohesiveness, we could have used others such as intermarriage or associational life.

With its large supply of available land within the city limits, Detroit in 1880 was an underused city. No spectacular crowding existed.

But this did not prevent it from being highly differentiated. The primary colors of the quilt represented pervasive ethnic and class differentials, which were confirmed by demographic differences. The many shades reflected the constant permeability, the rupture of divisions, the levelling of differences. The multidimensional analysis of small areas shows how cohesive neighborhoods actually were. Their characteristics were consistent with the divisions that existed in American society.

Detroit in 1880
Density Decline from the Center to the Periphery



GRAPH 1
(see note 10)

Table 1

Mechanical and Manufacturing Industries
City of Detroit - 1880

(6 largest in number of employees)

	Number of Employees	Number of Establishments
Clothing and Related Boot and shoe uppers; Boots and Shoes including custom work and repairing; Clothing, mens; Clothing, women's Corsets; Hats and Caps; Shirts	2,166	121
Lumber and Related Boxes, wooden packing; Carpentering; Cooperage; Furniture; Wooden Ware; Wood, turned and carved	1,702	104
Tobacco Tobacco, chewing, smoking and snuff; Tobacco, cigars and cigarettes	1,242	63
Transportation and Related Carriages and Wagons; Saddlery and Harness; Wheelwrighting; Shipbuilding	1,152	82
Food Baking and Yeast powders; Bread and Bakery products; Coffee and Spices; Confectionary Flour and Grist-Mill products; Liquors, Malt, Slaughtering and Meat Packing (not including retail butchering establishments)	1,100	113
Iron and Steel	1,095	7

Source: Compendium of the Tenth Census, Table LIII

Table 2

Race and Nativity - Detroit in 1880

Total	White	Colored	Chinese and Japanese	Indians	Native Born	Foreign Born
116,340	113,475	2,821	10	34	70,695	45,645

Source: 10th Census of the U.S. - Population, Tables VI and IX

Table 3

Ethnic Groups

	Birth Place			Percent	n	Standard Error of Estimate (2)
	Individual(1)	Father	Mother			
1.	U.S.	U.S.	U.S.	25.1	452	1.7
2.	Canada	Canada	Canada	5.7	103	0.6
3.	Great Britain	Great Britain	Great Britain	12.9	233	0.9
4.	Ireland	Ireland	Ireland	16.5	297	1.9
5.	Germany	Germany	Germany	36.5	658	2.9
6.	Poland	Poland	Poland	3.4	61	1.2

n = 1804(3)

(1) Heads of households

(2) See the formulae in O. Zunz, W. Ericson, D. Fox, "Sampling for a Study of Population and Land Use of Detroit in 1880-1885," Center for Research on Social Organization of the University of Michigan. Working Paper #124. December 1975, revised June 1976

(3) 1,804 of 2,410 heads of households were in one of these 6 categories

Source: O. Zunz,"Detroit en 1880: espace et ségrégation," forthcoming in Annales E.S.C.

Table 4

Occupational Groups

Category	Percent	n	Standard Error of Estimate
1. High White Collar	4.5	91	0.7
2. Low White Collar	26.0	520	1.5
3. Skilled	41.4	829	1.7
4. Unskilled	28.1	563	1.6

n = 2,003

Source: O. Zunz, op. cit.

Table 5

Marital Fertility

Ethnic Groups (1) and Occupational Groups (2)

America (3)	470	High White Collar	530
Canada (4)	764	Low White Collar	598
Great Britain	536	Skilled	794
Ireland	934	Unskilled	846
Germany	944		
Poland	1058		

(1) Ethnicity of the Mother

(2) Occupational group of the Father

(3) Born in the U.S., with 2 parents born in the U.S.

(4) Immigrant from Canada, with 2 parents born in Canada; same rule applies for Immigrants of the other countries (see Table 3)

Table 6

Cluster Analysis

	Diversity of Non-Residential Activities	Number of Fronts with Vacant Land per Unit	Ethnic Concentration (1)	Occupational Concentration (2)	Fertility
Categories					
1	0	0	no	no	0 - 400
2	1 - 4	1 - 3	yes	yes	401 - 800
3	5 - 10	4 - 6			> 800

Dummy variables	v1	v2	v3	v4	v5	v6	v7	v8
1	0	0	0	0	0	0	0	0
2	1	0	1	0	1	1	1	0
3	1	1	1	1			1	1
Weights	1	1	1	1	2	2	2	2

(1) See our measurement of concentration, the Standardized Chi-square index and its interpretation in O. Zunz "Detroit en 1880: Espace et Ségrégation," forthcoming in Annales E.S.C.

(2) ibid

FOOTNOTES

*This research was sponsored by grant Soc 76-00277 of the National Science Foundation. I wish to thank Ronald Aminzade, John Shy, Charles Tilly and Maris Vinovskis for their comments on the manuscript. The six maps of this paper have been made with the cartographic capabilities of the Michigan Interactive Data Analysis System (M.I.D.A.S.).

1. S. Warner and C. Burke, "Cultural Change and the Ghetto," Journal of Contemporary History, 1969, Vol. 4, No. 1:173-174.

2. E.W. Burgess, "The Growth of the City," in E.W. Burgess and R.D. McKenzie, The City, Chicago, 1925.

   R.E. Park, "The Urban Community as a Spatial Pattern and a Moral Order," Humal Communities, The City and Human Ecology, Glencoe, Ill., 1957:165-177.

3. A Cahan, The Rise of David Levinsky, (Introduction by John Higham), New York, Harper Torchbooks, 1960.

4. Warner-Burke, op.cit.

   L.F. Schnore and P. Knights, "Residence and Social Structure, Boston in the Ante Bellum Period," in S. Thernstrom and R. Sennett, eds., Nineteenth Century Cities, Essays in the New Urban History, New Haven, 1969.

   H. Chudacoff, Mobile Americans: Residential and Social Mobility in Omaha, 1880-1920, New York, 1972.

5. O. Zunz, W.A. Ericson, D.J. Fox, "Sampling for a Study of the Population and Land Use of Detroit in 1880-1885," Working Paper No. 124 of the Center for Research on Social Organization, The University of Michigan, December 1975. Revised June, 1976.

6. All the available census information was recorded for each individual living in the sampled fronts--Age, Sex, Nativity and Occupation are used in this analysis.

7. E. Robinson et R.H. Pidgeon, Atlas of the City of Detroit, embracing portions of Hamtramck, Springwells, and Greenfield Townships, Wayne County, Mich., New York, 1885 (29 plates).

   Land use characteristics were coded from the Atlas, complemented for Industries, Trade and Shops by the 1880 Detroit City Directory, compiled and published by J.W. Weeks.

8. Actually 1880-1885 since the Atlas was published in 1885.

9. Sam Bass Warner, The Urban Wilderness, New York, 1972. On the commercial city, see M. Katz, The People of Hamilton, Ontario, Cambridge, 1975.

10. Graph 1 represents the predicted values of the model $L_n \text{ density} = \beta_0 + \beta_1 \text{ Distance} + \beta_2 \text{ Distance}^2 + \varepsilon$. $R^2 = .92$. The city was divided into twenty-two density gradients from the center to the periphery. Areal and population data were computed from the sample on each gradient.

11. See K.T. Jackson, "Urban Deconcentration in the Nineteenth Century: A Statistical Inquiry," in L.F. Schnore, ed., The New Urban History, Princeton, 1975:110-142.

12. We derive this description from our land use data sets. For a good description of Detroit in the late 19th century, see D. Katzman, Before the Ghetto, Black Detroit in the Nineteenth Century, Urbana, Ill., 1973.

13. Olivier Zunz, "Detroit en 1880: espace et ségrégation," Working Paper No. 121 of the Center for Research on Social Organization, The University of Michigan, August, 1975. Forthcoming in Annales E.S.C.

The statistical analysis consists of interpreting the proportion of each group in each geographic unit in the light of a standardized chi-square: $X^2_s = \frac{X^2 - b(K-1)}{\sqrt{V(X^2)}}$ computed for the city as a whole and

$X^2_{is} = \frac{X^2_i - (K-1)}{\sqrt{V(X^2)}}$ computed for each unit, where K is the number of categories (ethnic, occupational) and b the number of geographic units.

14. If we compare the codes used by S. Thernstrom, The Other Bostonians, Cambridge, 1973, the Five Cities Project T. Herschberg, M. Katz, S. Blumin, L. Glasco, C. Griffin, presented at the Organization of American Historians, Chicago, 1973; T. Herschberg, Occupational Dictionary, Philadelphia Social History Project, March, 1974 and D. Treiman's prestige scale in D. Treiman, "The Validity of the 'Standard International Occupational Prestige Scale' for Historical Data," unpublished paper given at the Conference on International Comparisons and Social Mobility in Past Societies, Institute for Advanced Study, Princeton, June, 1972, the following professions have received similar classifications:

High white collar
Architect, Clergyman, Dentist, Judge, Lawyer, Minister, Officer U.S. Army, Physician, Veterinary Surgeon - Banker, Commercial merchant, Merchant

Low white collar Accountant, Advertising Agent, Agent, Bookkeeper, Broker, Insurance Agent, Real Estate Agent - Boarding House Keeper, Foreman, Hotel Keeper, Restaurant Keeper, Saloon Keeper, Supervisor - Auctioneer, Comm. Traveler, Grocer, Peddler - Cashier, Clerk, Dealer, Salesman - Bank Teller, Collector - Builder, Chemical Worker, Chemist, Civil Engineer, Designer, Druggist, Herbalist, Optician, Ship Builder, Stenographer, Telegraph Operator - Music Teacher, Teacher - Actor, Artist, Journalist, Musician

Skilled

Blacksmith, Brush Maker, Cabinet Maker, Carriage Maker, Cooper, Coppersmith, Engraver, Jeweller, Locksmith, Moulder, Nail Maker, Pattern Maker, Polisher, Stone Cutter, Tanner, Tinner, Tinsmith, Turner, Upholsterer, Watch Maker, Weaver - Bleacher, Boiler, Book Binder, Compositor, Conductor, Cooker, Dyer, Electrician, Electrotyper, Engineer, Gas Fitter, Lithographer, Presser, RR Conductor, Stationary Engineer, Typesetter, Watch Repairer - Dress Maker, Furrier, Hatter, Knitter, Milliner, Seamstress, Tailor - Brick Layer, Brick Mason, Carpenter, Lumberman, Mason, Painter, Roofer, Stone Mason - Baker, Brewer, Butcher, Confectioner - Barber, Hairdresser, Nurse, Piano Tuner - Copper

Semi-skilled et unskilled

Apprentice - Factory Work, Miner, Packer - Boatman, Brakeman, Carman, Carter, Coachman, Drayman, Driver, Flagman, Hostler, Railroad Worker, Sailor, Switchman, Teamster - Fireman, Policeman - Bartender, Bellman, Cook, Housekeeper, Janitor, Launderer, Letter Carrier, Messenger, Newsboy, Officeboy, Porter, Servant, Steward, Waiter, Watchman - Farm Laborer - Laborer

15. E.M. Kitagawa and P.M. Hauser, "Trends in Differential Fertility and Mobility in a Metropolis: Chicago," in E.W. Burgess and D. Bogue, Urban Sociology, Chicago, 1967, abridged edition:32.

16. T. Hareven and M. Vinovskis, "Marital Fertility, Ethnicity and Occupation in Urban Families: An Analysis of South Boston and the South End in 1880," Journal of Social History, Vol. IX, March, 1975:69-93. To compute the child-woman standardized ratio, we used Hareven-Vinovskis suggested weights.

17. Using the cluster program in the Michigan Interactive Data Analysis System (M.I.D.A.S.).

18. O. Zunz, "Espace et ségregation," op.cit.

19. The first 5 categories of this table, Center type, Residential Center type, East side, West side and Background are derived from the cluster solutions containing 10 clusters. Some clusters have been divided into two. Although in the same solution, units were in effect inhabited by different ethnic groups and geographically separated. Thus Irish of the West and Germans of the East would both be skilled or unskilled workers (occupational concentration), live in units with high fertility levels, and which rate medium in land use variables. We partitioned them geographically when analyzing the solution.

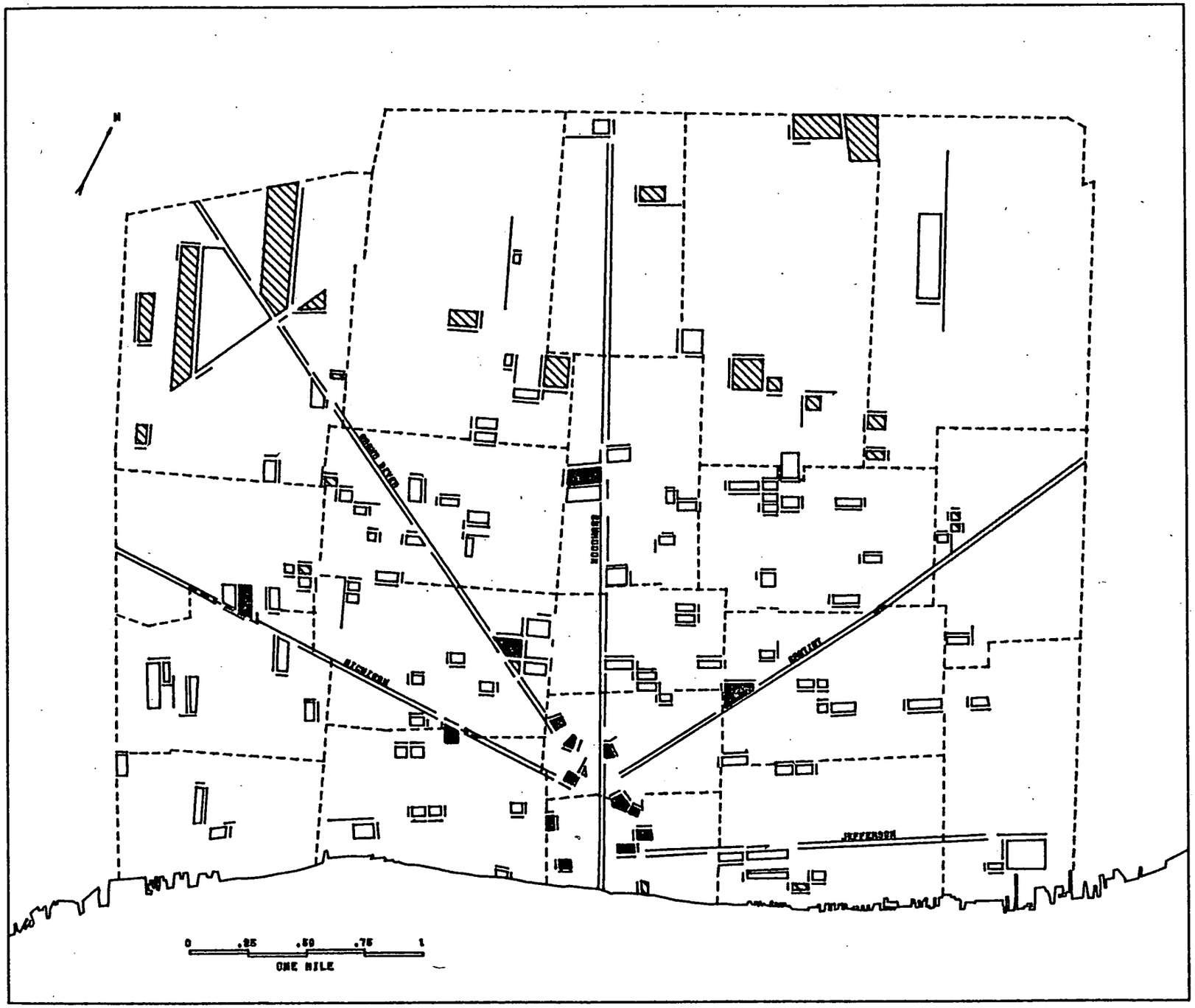
20. Two inhabited units were not included because no woman aged 20-49, married, with husband present were living in these units. We excluded from the cluster analysis rather than assigning them a fertility of 0. Thus, the analysis was performed on 102 units (127 sampled - 25 (category 6)).

DETROIT, 1880 SAMPLE: VACANCY, DIVERSITY OF ACTIVITIES

LAND USE

VACANT 1

ACTIVI 7

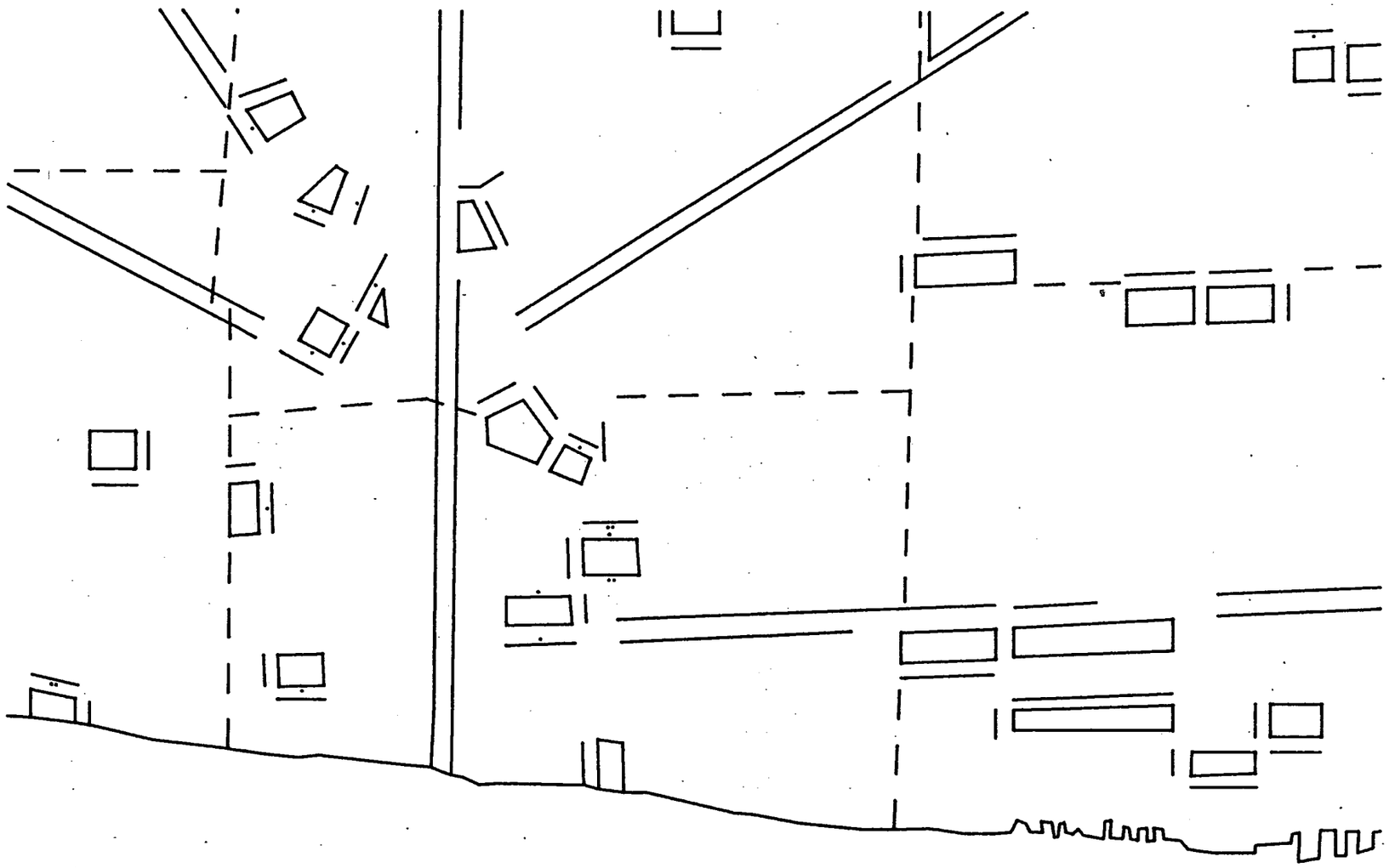


HOTELS, BOARDING HOUSES IN 1880 DETROIT

BOARDING

ONE 1

TWO 2



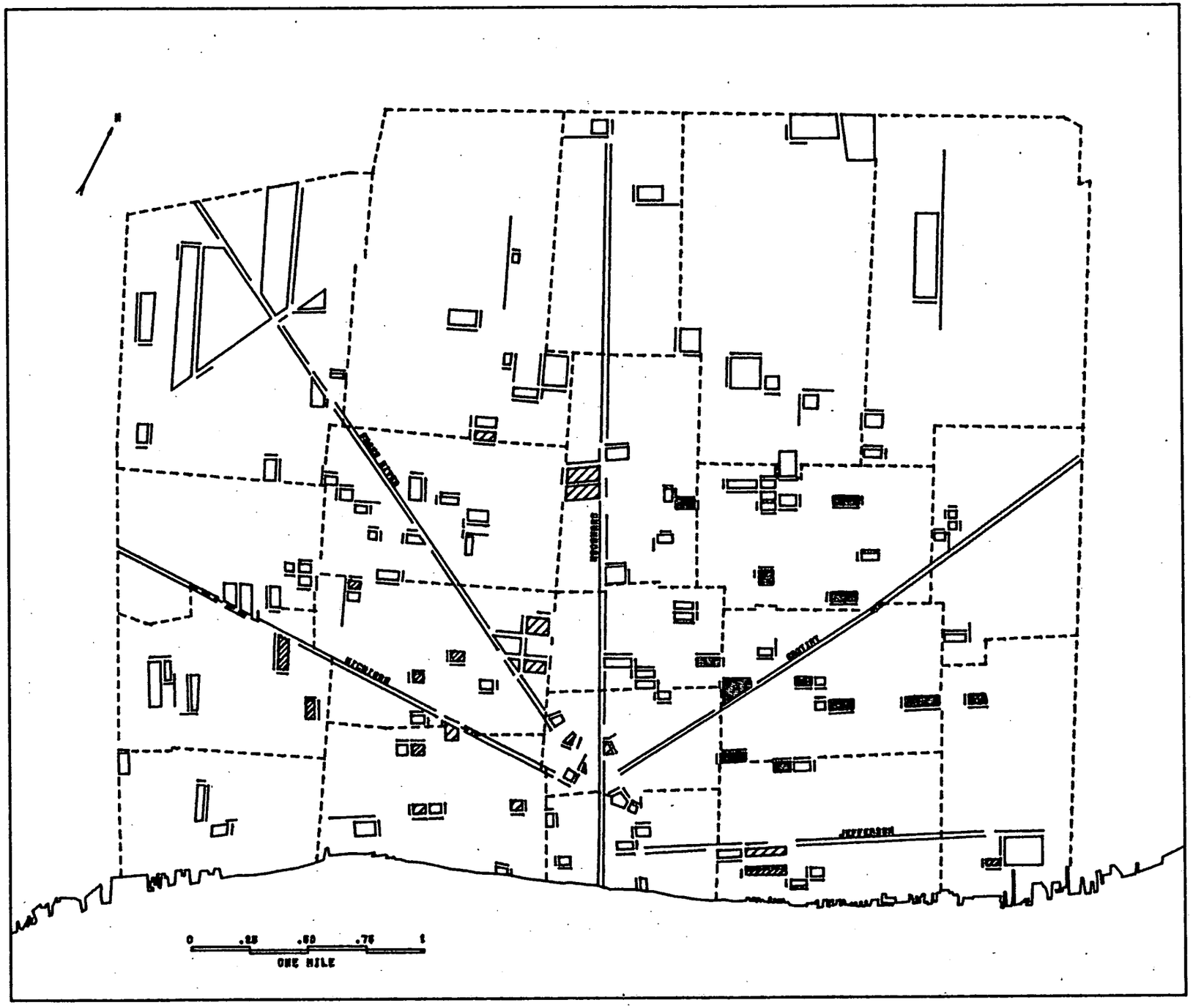
CLUSTERING PATTERN OF THREE ETHNIC GROUPS

ETHNIC

AMERIC 1

IRISH 4

GERMAN 7



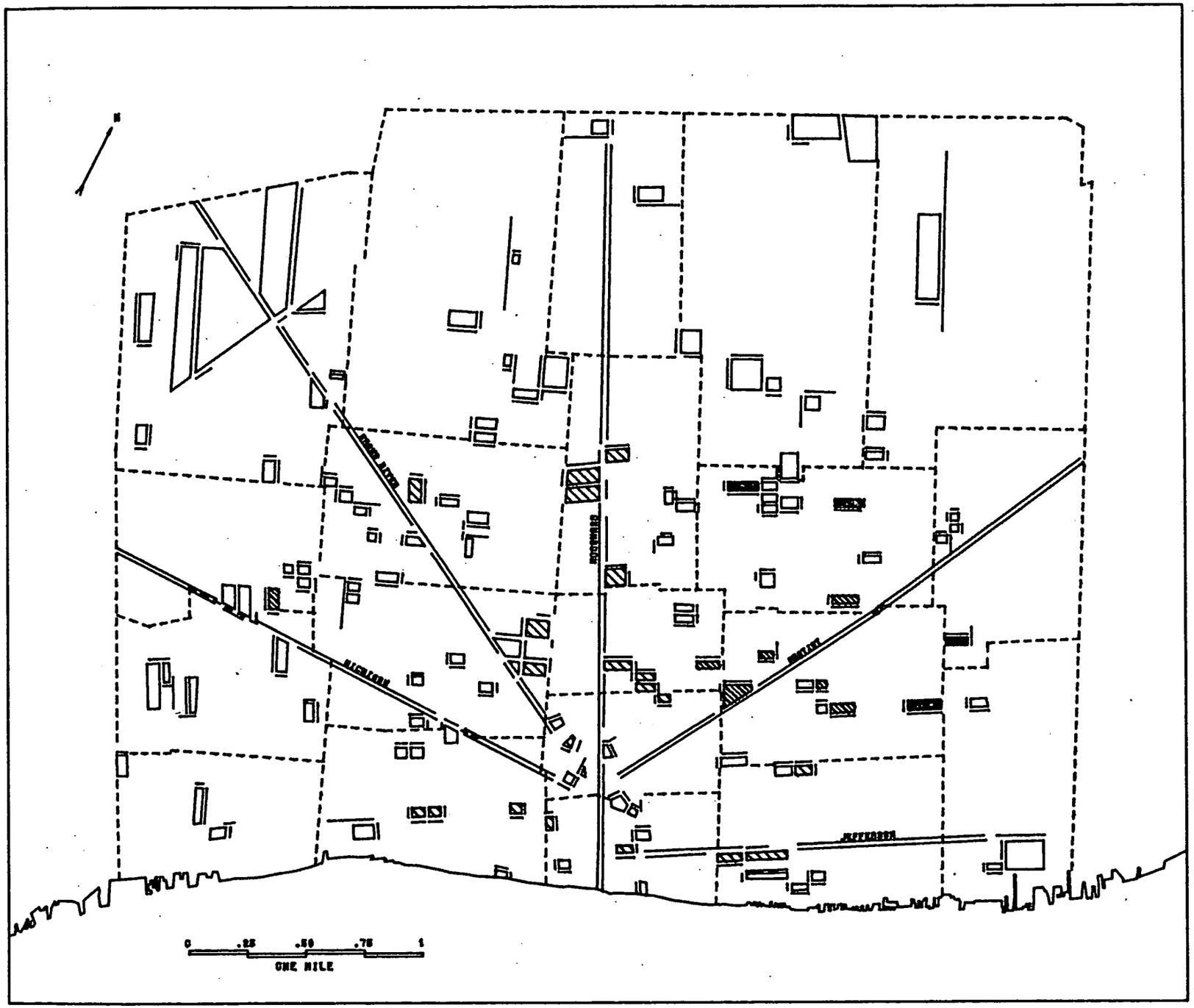
CLUSTERING PATTERN OF THREE STATUS GROUPS

OCCUPATI

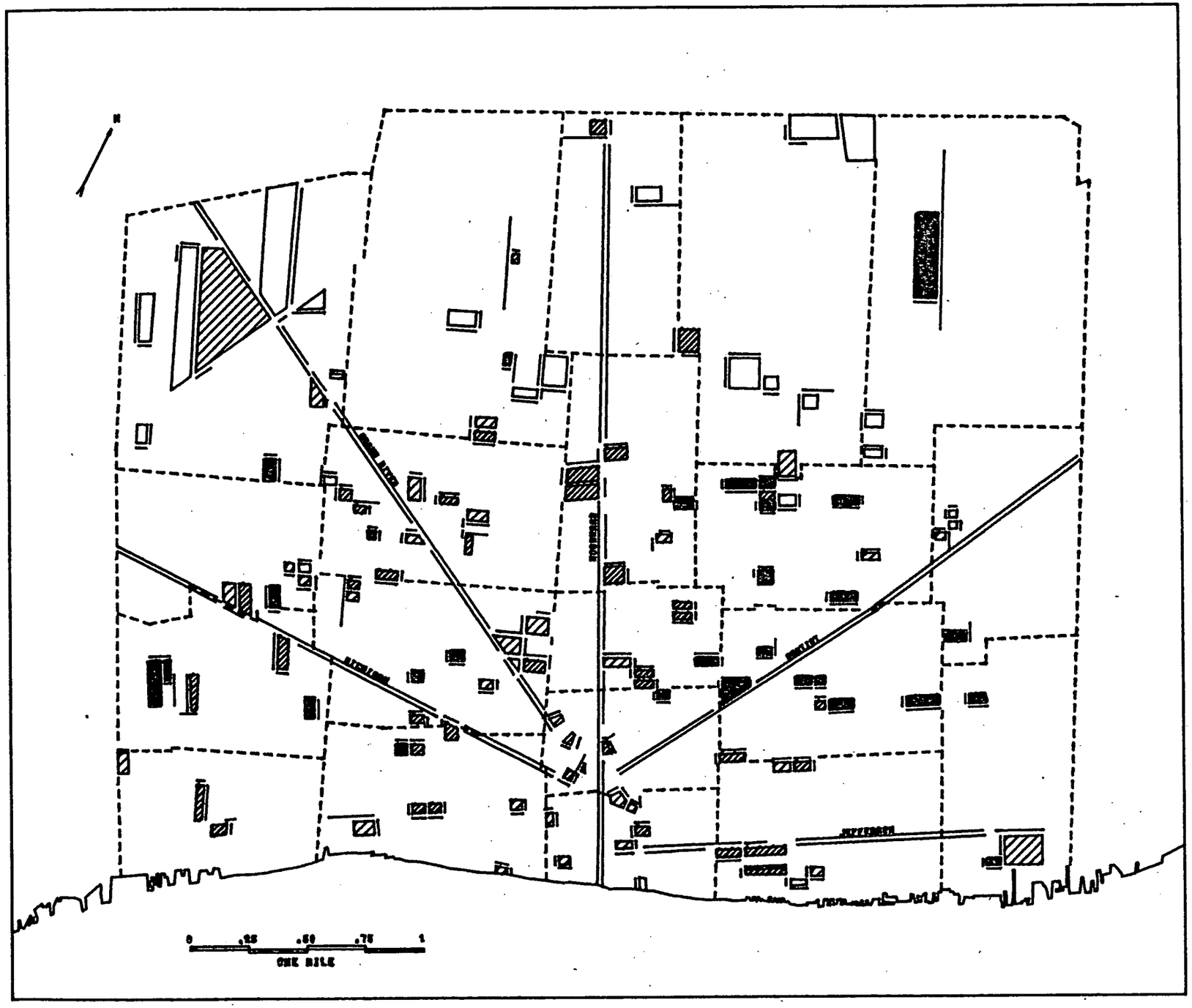
WH.COL 1

SKILLE 4

UNSKIL 7



FERTILITY: CHILDREN UNDER 5 PER 1000 MARRIED WOMEN (20-49)



CLUSTERS IN 1880 DETROIT

CLUSTERS

CENTER 1

CE.RES 4

CLUSTERS

WEST B

EAST G