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A new technique for analyzing the morphology of residential areas and its application to Missoula Montana

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A NEW TECHNIQUE FOR ANALYZING THE MORPHOLOGY OF
RESIDENTIAL AREAS, AND ITS APPLICATION
TO MISSOULA, MONTANA

By

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INTRODUCTION

In a presumably enlightened age, the persistence of such urban maladies as congestion, slums, and rioting suggests that our knowledge of what makes cities function successfully may still be somewhat superficial. Urban geography, in pursuing answers to urban problems, often treats the city as a morphologic entity, susceptible to dissection and analysis. Thus, the difficult whole, the physical city, is divided into a series of separate, yet internally homogeneous components. The residential component, being relatively easy to define and of major importance in every city, has been a favorite morphologic unit for those geographers seeking to explain the nature and evolution of differentiations within the physical city.

The residential component of a city may be subdivided in different ways, depending on the purpose of the study. For example, the ethnic backgrounds of the inhabitants may be used as a basis for subdividing the residential component into districts; or the types of structures present (e.g., single family homes, duplex apartments, multi-family apartments) may determine a different kind of
subdivision. Many schemes seek to define residential sub-units in terms of quality, and because so many of today's urban problems are associated with conditions of deteriorating quality of housing, this approach has special merit.

This paper is a case study of residential neighborhoods in Missoula, Montana. The two major aims of the paper are 1) to develop and substantiate a technique for defining residential sub-units of varying degrees of quality, and 2) to trace the development of Missoula's residential areas, making use of the structural units previously defined. Residential neighborhoods are herein considered in terms of the occupations of their inhabitants—an approach which raises several subsidiary questions which must be answered before residential development can be discussed.

Residential areas defined in terms of occupations

If one were asked to describe a hypothetical neighborhood populated entirely by doctors and lawyers, his description is apt to vary considerably from one he would give of a second hypothetical neighborhood peopled exclusively by, say, migratory fruit pickers. The reason is obvious: experience has led him to expect that doctors and lawyers will generally seek out and can usually afford reasonably comfortable and attractive physical surroundings, whereas fruit pickers, in the main, cannot. A shorthand way of saying the same thing is to say that doctors and lawyers usually live on a higher socioeconomic level than fruit pickers. One may argue from this that a continuum of occupations and corresponding socioeconomic
levels exists, grading from somewhere near the level of the fruit pickers to another point near the level of doctors and lawyers. The concept of neighborhood used in this paper presupposes the existence of such a hierarchy. For the purpose at hand, it is divided into four categories or classes: lower, lower-middle, upper-middle, and upper. Neighborhoods are, in turn, divided into four corresponding types on the assumption that the qualitative aspects of a neighborhood closely correspond with the social status of its residents. A neighborhood of a given class, or category, is defined when and if a significantly larger proportion of one occupational class resides therein than any other. Chapter III develops this idea and defines "areas of dominance," the basic structural units of the analysis.

Ranking of occupations

The NORC (National Opinion Research Center) prestige scale and the Duncan socioeconomic index together provide the foundation for the classifications of occupations used in this paper. These are both full-scale expositions of the idea that occupations can be assigned positions on a hierarchy, each defining its hierarchy slightly differently. Because of the importance of rank-ordering of occupations to later mapping and analysis, Chapter I discusses the concept in detail and describes how the particular methodology employed in this study evolved.
Scope of the study

The outline of Missoula's residential development raises a host of questions: Are the patterns found normal or abnormal? Why? What forces have acted in past years to create the existing configurations? Can the existing trends be altered? How? Has any light been shed by the example of Missoula on the existing theories of urban structure? These questions for the most part lie outside the scope of this inquiry, and, although many are touched upon, none are treated exhaustively; the emphasis, rather, is on the development of a methodology and its application. Of all the questions listed, that of determining forces is treated most thoroughly. An effort is made to relate the developing patterns to significant events in the city's history, and the results of the research technique employed are compared with generalizations made by a prominent writer on the subject of residential structure and growth. While it is hoped that both these attempts will lead in the direction of further clarification and understanding of some of the forces at work in expanding cities, it is also recognized that these forces are so complex that a single case study such as this one cannot hope to deal with them comprehensively.

The study focused on the following years; in addition to being spaced fairly regularly, these particular years offered certain additional advantages, as listed:

1903 - year of the oldest Polk city directory, which initiated the house numbering system currently in use.
1925 - terminating year for Shirley Jay Coon's dissertation on the economic development of the city.¹

1948 - avoided the abnormal World War II years; also close to the period where data for the Duncan study was collected.

1965 - recent enough to reflect current trends but not so recent that an accurate base map was not available; also, the year that data for the Missoula comprehensive plan was collected.²

Some space is also given to a discussion of residential patterns in 1871 and 1890. The year the town was entered from the public domain, 1871, offers a convenient starting point for discussion of residential growth. In 1890 the earliest city directory was compiled, and it was possible to extract from it information helpful in analyzing the important formative years of the city.

Occupations and addresses of city residents during the different subject years were obtained from contemporary city directories. This was a straightforward process which presented no particular problems except in 1903, when some incomplete addresses appeared, and 1890, when, as later explained, the streets were not yet numbered in a regular fashion. The use of the directories limited the area that could be considered to the numbered streets. Thus, East Missoula, the upper Rattlesnake Valley, and suburban West Missoula are not included in the data.


²"Comprehensive Development Plan, Missoula, Montana," prepared for Missoula City-County Planning Board by Clark, Coleman, & Rupeiks, Inc., April, 1967. (Offset.)
Organization

The presentation is organized into four chapters. Chapter I is concerned exclusively with methodology; it reviews the scales devised to rank-order occupations and describes a preliminary investigation into the structure of the early city. Then, a revised approach to defining structure is formulated, based partially on the results of the preliminary study. It depends on the identification of four groups, or categories of occupations, each of which is representative of a different social class. The occupations chosen as representative and the mapping technique are discussed.

Chapter II reviews historical material relevant to the growth of Missoula's residential areas. Chapter III presents the results of the research in a series of dot maps accompanied by various interpretative materials. Chapter IV discusses the implications of the findings. The method is tested for accuracy by comparing the dot maps for 1965 with information on the condition of structures in the city that year. The observed patterns of growth are compared with national trends and some inquiry is made into the reasons Missoula developed as it did. The paper concludes with an assessment of the success of the technique as an analytical tool.
CHAPTER I

THE DELIMITATION OF CATEGORIES OF OCCUPATIONS AND
THE EVOLUTION OF METHODOLOGY

Introduction

The chapters that follow will present the areal distribution in Missoula of selected occupations at different periods in time. The question this chapter deals with is whether, and to what extent, the selected occupations represent different social classes. To provide a general setting for this question, the broader concept of social stratification and measurement thereof is first considered. Then, because the occupations selected to represent different social classes were determined in part by the results of a preliminary study, that study and the change of methodology that followed it are also discussed.

Occupation as a Measure of Social Status

Sociologists have long been interested in measuring the social status of occupations. To a large degree this interest has been associated with inquiries into the nature of social stratification--
the broad theory which posits society at large as being composed of "layers" of different classes of people. Although relative position on a presumed social hierarchy may be estimated in different ways, probably no measure has been more popular than occupation.

To quote Harold M. Hodges,

of all the indices of class, none has in fact been used so frequently as 'what people do.' . . . in the words of Reissman, occupational measures 'seem to catch and concretize the impressions that most people have of the class structure.' It is something that is simultaneously as tangible as it is objective. Furthermore, in a class (in contrast to an estate or caste) society such as America's, the social hierarchy is based in the main on differences in wealth and income; and the basic sources of such economic wherewithal are full-time occupational roles. Indeed, social classes are 'aggregates of persons with similar amounts of wealth and similar sources of income.'

Of the various instruments which have been devised to rank occupations, two, the NORC-North-Hatt prestige scale and the Duncan socioeconomic index, appear quite frequently in the current literature. Both are thoughtfully conceived, and both are considered "valid" measures of the social status accorded to various occupations. The word valid must remain in quotation marks when used in this connection because absolute social status is hardly an objective, quantifiable entity. Much like intelligence, the concept of social status has proved useful in many investigations, even though no one has been able to say precisely what it is. Social status remains, to paraphrase a psychological maxim, "what the social status tests measure," and the NORC and Duncan scales,

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although perhaps crude, are two of the best "tests" yet devised. Both were utilized in choosing the index occupations of this paper.

The National Opinion Research Center (NORC) rating scale

The NORC scale was devised in 1947, when sociologists Cecil C. North and Paul K. Hatt, sponsored by (among others) the President's Scientific Research Board and the National Opinion Research Center, conducted a study of the "prestige of occupations." The NORC field staff personally interviewed 2,920 people, a number which, by 1947 sampling standards, was considered representative of the entire country. This attempt to achieve a representative assemblage of respondents sampled was one of the features that set this study apart from those that preceded it. Respondents were asked their "own personal opinion of the general standing" of ninety different occupations: whether they considered them to be "excellent," "good," "average," "somewhat below average," "poor," or whether they knew too little about the occupation to give an opinion. The results were then compiled to produce an "average score" for each occupation which theoretically could range from 20 to 100 and actually varied from 33 for a shoeshiner to 96 for a U.S. Supreme Court Justice. The NORC scale was immediately regarded as a useful tool. According to Albert J. Reiss, Jr., "few empirical studies have achieved a place in the scientific

literature comparable to that of the NORC-North-Hatt investigation
... the North-Hatt ranking of occupations has been widely
accepted as affirming a rank structure of the prestige status
of occupations."^3

Unfortunately, the NORC scale ranked only ninety occupations,
and many investigators began "interpolating" ratings for occupations
not listed. A method of expanding the NORC prestige scale through
the use of census data was developed in 1961 by Otis Dudley Duncan. 4

The Duncan socioeconomic index

The 1950 census classified occupations into 270 major cate-
gories and 155 subgroups. For each of these, Duncan computed an
index number, ranging from 0 to 100, based on the percentage of
individuals in each category who exceeded specified levels of income,
and of formal education. The computation was made by assembling
data on these two factors for forty-five selected occupations,
previously rated in the NORC study. Through multiple regression
statistical techniques, weight was assigned to the two factors in
such a way that the closest possible correlation was established
between the new index numbers and the NORC scale values. The
multiple regression equation thus derived was then used to calculate
SEI (socioeconomic index) numbers for all occupation categories.

3Albert J. Reiss, Jr., Occupations and Social Status (Glencoe,

4Otis Dudley Duncan, "A Socioeconomic Index for All Occupations,"
and "Properties and Characteristics of the Socioeconomic Index,"
Chapters 6 and 7 in Albert J. Reiss, Jr., ibid., pp. 109-161.
Thus, the Duncan index was intended as an extension of the NORC scale; it was designed to approximate the NORC ratings closely enough to serve as an acceptable substitute for them in any research where a rank-ordering of occupations is required but some of the occupations under consideration are not on the NORC list.5

The two scales compared

The resulting Duncan scale is a fairly close match of the NORC ratings. Scores for twenty-nine of the forty-five occupations—to illustrate briefly the degree of correlation—differ on the two scales by fewer than ten points.6 There is, of course, no way of knowing with assurance how well the SEI scores for occupations not included in the NORC survey would align with ratings derived from an extended prestige survey. Duncan, in this regard, feels that because the forty-five occupations included on the original list are especially well-known, he can claim only that his index is probably a "fair predictor" of prestige ratings for occupations "equally as salient as those in the NORC study."7 Other immediate reservations, including those on the reliability of the census information and the serious biasing of the index for some occupations (for example, farmers, where much real

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5Ibid., p. 115.

6After the NORC scores are converted from a 20-100 scale to a 0-100 scale; see ibid., pp. 122-123.

7Ibid., p. 130. It follows here that although it is likely that the Duncan scale will prove a poor predictor of prestige status for less well-known occupations, it could well be an even better measure of actual social status than the NORC ratings, if "actual social status" is thought of in socioeconomic terms.
income doesn't appear in the census statistics, temper somewhat the apparent success of the Duncan index as a rating device. Still, if the NORC scale is in any sense a standard, Duncan has by and large duplicated it, and, by extending it, has extended also the potential usefulness of the general concept of ranking occupations according to their social status. In addition, the relatively close correlation achieved between ratings derived from independent data sources lends credence to the basic assumption that the rank-ordering concept is sound.

A Preliminary Study

The technique used in the following chapter for representing the location of nodes of presumed social classes evolved from a preliminary study of Missoula as it existed in 1903. The Missoula city directory for 1903 was the source of data, providing the occupations of most residents of the city. The Duncan socioeconomic index was the tool used to give the occupations numerical values; it was used because the directory contains far too great a variety of occupations (over 250) to use the NORC scale effectively.

The 1903 city directory lists names of 3,652 "adult citizens of Missoula." This figure is undoubtedly exaggerated. A sample of 10 percent of the directory (16 pages) revealed that 24.5 percent of the

8Both scales, however, are limited in several respects and are not quite as potent as research tools as they might appear. Discussion of some of their more important limitations, and how the problem at hand is affected by them, is most appropriately deferred until the original method of mapping residential areas of presumably different quality—which relied heavily on the Duncan index—is described.

people listed either could not have been residing in Missoula or in all likelihood were not. Consequently, the directory listed the names of about 2,757 bona fide adult Missoulians. Of this total, about 2,100 or 76 per cent, were complete entries, listing after the name an occupation and an identifiable city address. No sampling technique was used in the study; this complete list of 2,100 individuals formed the data base.

As a first step, the Duncan socioeconomic index number corresponding to each of 2,036 usable entries was plotted on a large map of the city. Next, the average index value for each city block was computed, a value which presumably reflected the socioeconomic, or prestige status of the block, as a geographic unit. In order to make these computations without giving undue weight to addresses with multiple entries, the following somewhat arbitrary rules were observed: 1) working wives, wherever identified, were immediately eliminated—that is, not plotted at all if their index value was lower than their husband's; if higher, both were plotted, 2) if only two entries finally appeared at a particular address, only the higher index number of the two was included in the block average, 3) if three entries appeared at an address, the lowest one was discarded and the two highest averaged to obtain a single entry for that address, 4) if four through seven

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10 The directory included names of deceased persons, persons who had moved, soldiers at Fort Missoula, and persons with out of town addresses. Railroad workers listed with no address were also considered not to have been residing in Missoula, on the assumption that their names came from a company listing and not from a house survey.
entries appeared\textsuperscript{11} at a given address, they were all averaged to obtain a single entry, 5) if over seven entries appeared, they were averaged; the number of entries was divided by five and the address was represented by one entry of the average index value for each multiple of five, to the nearest whole number. So, in computing the block average, (to illustrate rule 5) twelve individuals each with index numbers of nineteen, living in a boarding house, counted exactly the same as two other individuals with index values of nineteen who owned their own homes.

No minimum number of residents was required for a block to receive an average value; that is, a block with only one resident—a carpenter, for example—received an average value of nineteen (the SEI value for carpenter) which is no different from the average value of nineteen another block might have received after thirty or forty individual entries were averaged; both blocks appear the same on the resulting map. This was done because of the large number of blocks with a limited number of residents; it was felt that omitting any of these areas from the compilation in favor of more fully settled blocks would result in a less accurate representation of true neighborhood character and extent than if they were included—despite the perhaps undue weight given some of the less populated blocks. Figure 1 indicates the range of average values obtained for the 251 blocks that comprised most of 1903 Missoula. For mapping purposes, the continuum of index values, ranging from

\textsuperscript{11}If over three entries appeared at an address, it was felt that a boarding situation probably prevailed.
Figure 1 - Distribution of Average SEE scores of City Blocks, Missoula, 1903

mean = 38.7

n (total) = 251 city blocks

Socioeconomic Index (SEE) scores
three through eighty-five, was divided into four categories, as shown. The categories were delimited at the approximate mean of the distribution and at convenient cutoff points as close as possible to points one standard deviation on either side of the mean. As it happened, the two middle categories encompass a percentage of the sample slightly larger than the sixty-seven per cent defined by these criteria. Map 1 shows the distribution of the four categories of index values throughout the city.

The major drawback of this technique is that it is too time consuming to apply to cities with appreciable populations. Therefore, an alternative approach, which measures in a slightly different way the distribution of occupation categories, was developed based on the results of the above. Before this technique is explained, however, two important limitations on the general usefulness of the rank-ordering concept should be noted.

Limitations of the rank-ordering concept

First, both scales being considered in this paper are based on data collected during the period 1946-49. Certainly the status of some occupations, if not all, changes over time; so there is reason to doubt that the results of these two scales are equally applicable to different time periods. On the other hand, any arbitrary change in the ratings may only compound whatever error exists. It is not certain, for example, whether the status of blacksmiths was higher in 1903 than 1950 or lower: was it higher because the trade was of a greater general importance, or was it lower because
Map 1 - Average Socioeconomic Index (SEI) Values for City Blocks in Missoula - 1903

SEI values:
- Light gray: 0-18
- Medium gray: 19-38
- Dark gray: 39-57
- Black: 58-90
the 1950 artisan possessed a rarer, more valuable skill, in relatively greater demand than it would have been in 1903? Duncan concludes tentatively that his ratings are fairly stable in the short run but over a long period of time become seriously distorted. He does not specify what he means by long and short periods, but the inference is that a short period is in the order of ten to thirty years. In view of these sketchy guidelines, no arbitrary changes in ratings were made to "correct" for status changes over time. Similarly, no corrections were attempted to compensate for possible variations in ratings in different regions of the country.

Another limitation of these scales is their low correlation with socioeconomic status as measured by such variables as income and education, at the individual level. That is, although the scales may successfully rank-order abstract, census-determined occupation categories according to selected criteria, their effectiveness at rank-ordering people performing specific jobs is notably poorer. This low correlation should not be too surprising. The categories of occupations defined by the Bureau of the Census can, at best, only approximately describe actual occupations, whose titles, in turn, merely suggest the myriad work experiences involved in specific jobs. As Duncan points out, "a number of aspects of the work role, and not merely its occupational classification, may be relevant to the individual's standing in the eyes of those with whom he interacts

directly. In addition, he writes, "This standing may also depend on attributes and roles of the individual having little connection with his occupation."

It is not certain to what extent this limitation is relevant to the 1903 study just discussed. The individual scores, to be sure, are treated collectively; and it is not unreasonable to suppose that errors in the estimation of the numerical status of individuals tended to cancel themselves out. This was the primary reason for using every possible entry in the directory rather than a small sample. But this assumption cannot be made without some reservation. It will be recalled that averages were not computed for any area larger than a city block; and although the city-wide average was over eight entries per block, due to the concentration of people in the downtown area, many blocks contained fewer than eight entries, and some, as mentioned, had only one or two. When block averages are computed from numbers this small, the consequences of assessing individuals incorrectly become more serious and the question of how accurately Duncan's scale assesses individuals increases in importance.

Duncan advises that in research dealing with differences among individuals, his index should be employed in the context of other relevant socioeconomic variables. It should not, except as a matter of expediency, be assumed to serve by itself, in lieu

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13 Ibid., p. 145.  
14 Ibid.  
15 A total of 2,036 usable entries resided in 251 city blocks.
of all other such variables... Some arbitrary adjustments of SEI scores were made in the interest of increased accuracy; these were based on such factors as historical reputation, the particular kind of directory entry, and the number of workers a person employed. Unfortunately, such additional information was available for only a small number of entries, and even then no systematic way of applying it was developed.

Despite these qualifications, if SEI numbers can in any way reflect neighborhood character, it seems likely that the method outlined above represents a means of doing so as valid as any possible. This is so mainly because all working residents of the city are included in the computations and no errors are introduced because of sampling techniques.

A Simpler Mapping Technique

As already noted, a simpler mapping technique evolved from the one just discussed, designed to locate areas of differing status by defining them in terms of concentrations of occupations with similar status ratings. This technique consists of selecting groups of "index" occupations, each group presumably representative

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17 Entries vary considerably, especially in earlier years, and sometimes influenced scores—both by suggesting adjustments (for example, the president of a grocery store with four other officials and an elaborate descriptive entry, presumably should rank higher than the owner-operator of a neighborhood store) and by clarifying uncertain cases (e.g., whether someone is associated with a relatively large or small manufacturing concern).
of a segment of the Duncan hierarchy, and presenting their locations by means of dot maps. Four categories of occupations were chosen:

1. Laborers and helpers; index numbers: 3-12.

2. Carpenters, auto mechanics, and similar workers; index number: 19.

3. Proprietors of various types of establishments; index numbers: 43-70.

4. Various professional people; index numbers: 76-100.

A full list of the occupations used appears in Appendix I, along with a discussion of particular difficulties encountered in making the choices.

Each group of occupations is intended to correspond to a particular social class—as defined in terms of SEI numbers on Figure 1 and Map 1. The index occupations in the high and low social status groups were not difficult to select. Because there are relatively so few people listed in the city directories with occupations at the high end of the Duncan scale, most with an SEI number over seventy-six were included in the analyses for the various years; on the opposite end of the scale, undifferentiated, so-called "common" laborers form a representative, well-populated category. It was in the middle portion of the social spectrum that uncertainty in the choice of index occupations arose. To insure a maximum theoretical separation between classes, occupations with index numbers around the mid-points of these two classes—twenty-nine and forty-nine—should have been chosen. But no convenient cluster
of common, readily identifiable occupations exists around these values; therefore, the occupations were chosen somewhat differently, as described below.

The term "upper-middle class," in common usage, implies a proprietary class; values for proprietors and managers of different types of establishments exist throughout (and outside) the range of thirty-nine through fifty-eight. So, with certain exceptions (noted in Appendix I), this entire family of occupations was selected to represent the class. The upper limit was extended from SEI value fifty-eight to seventy in order to include what were considered to be several excellent representatives of the class.

The so-called "lower-middle class" presented a different problem. No family of occupations exists which is commonly associated with this particular social standing. A number, though, that appeared quite often in tabulating the data for Map 1 was nineteen, just on the dividing line between the two lower classes. Nineteen is the SEI number for a group of thirteen different occupations, two of which--carpenter and auto mechanic--are particularly well-defined in the sense that people in each of these trades possess common skills. In addition, they are commonly occurring occupations and both were included on the NORC prestige scale, where they received ratings of thirty-three and twenty-six respectively.\(^{18}\) The higher value here is at least a suggestion

\(^{18}\)On the 0-100 converted NORC scale used to compare the two studies.
that these two occupations, if they occur often enough, will adequately represent the entire class. In fact, they do occur quite often, and form the bulk of entries in this class in later years. One other commonly occurring occupation with an SEC number of nineteen—bartender—was omitted completely for the opposite reason: its prestige value, as measured by the NORC scale, was very low, so low (seven), that it was feared that including it would skew results in the undesired downward direction.

Accuracy and effectiveness of the technique

The questions of the accuracy and inclusiveness of these groups of occupations cannot be fully answered here. It has been shown that they were derived largely from the Duncan scale; to the extent then, that the Duncan scale is accurate, the groups should be homogeneous and should accurately reflect different social classes. Assuming that the chosen groups do accurately reflect different social classes, it is also possible that they are representative but not sufficiently inclusive—that some areas, if a better measure were available and used, would show class characteristics (a clustering effect) which are not apparent on the dot maps of this study only because critical occupations were excluded from the compilations. There is no way to eliminate this possibility, and consequently it should be recognized that any tendency toward clustering

19 Auto mechanics appeared first in the 1925 directory.
that is noted may well be incomplete in the sense that the area defined is not the total area occupied predominantly by that particular class.

In addition, the limitations in effectiveness of the occupation ranking concept, which were described above in reference to the block-average study, are equally applicable to the dot map scheme. Relative stability of occupational prestige over time can only be assumed; and every individual dot represents an individual judgement. Large aggregates of dots may be presumed to have overcome individual errors, but small aggregates, or a faint tendency toward clustering should be viewed skeptically.

Map 1 and the dot map representing 1903 (Map 5), show a high degree of visual correspondence, and this correspondence is perhaps as good a test as is available for checking the effectiveness of both techniques in displaying 1903 distributions. The entire south side corresponds particularly well, the Category 1 showing up strongly east of South Higgins Avenue and the Category 2 area west of South Higgins. Mid-downtown and the area along East Cedar (Broadway) and East Pine also show clearly as Category 1 and 2 areas. Other areas also correspond noticeably, in particular the eastern portion of the square, northside school section\(^20\) (mostly Category 4), its southwestern quarter (Category 3), and the 1st Street (Le Vasseur) area (Category 4). The area immediately north of the Northern Pacific tracks, along North 1st West and North 2nd

\(^{20}\)Bounded by Lincoln Street, Toole Avenue, and Worden Street.
West shows the greatest divergence. Here, the block average map indicates a higher concentration of Category 1 and 2 entries than the dot map. This incongruity is a result of the area being largely dominated by relatively high-valued railroad workers who are not included in the proprietary class. The block bounded by A Street, Montana Avenue, North 2nd West, and North 3rd West, for example, contains eleven entries; seven of these are railroad engineers or conductors, all with SEI values of fifty-eight. The 1903 directory happens to contain an exceptionally large number of high value railroad workers, and it is very doubtful that a high value concentration due to their effect would have ever repeated itself in later years.

**Details of Map Construction**

The base map for this study, showing the street plan of Missoula and a portion of the Clark Fork River, was taken from the four United States Geological Survey topographical maps that, together, cover the Missoula vicinity. These maps were field checked for accuracy in 1964 and may be presumed to quite accurately reflect the street pattern of 1965. For the sake of convenience, the 1965 street pattern appears in all the maps (except Map 2). The opening of new streets was, of course, a gradual process and superfluous streets should be ignored on the earlier maps. Dots could only be placed when street addresses were available; thus the earlier maps show an absence of inhabitants on the fringes of town when actually many areas—particularly Orchard Homes—have
been continuously settled since early times. The number of such commissions, however, is insufficient to affect the results of the study, and the effectively settled urban area for each of the subject years is defined fairly accurately by the dot patterns.

After the various index occupations were identified in the city directories, it remained to plot the locations of the associated addresses on the base maps. A series of intermediate data sheets was used to facilitate this task and minimize errors. The data sheets included street names and house numbers. After they were completed it was a relatively simple matter to transfer the dots to the unnumbered base maps. Examples of the data sheets are included in Appendix II.

Each dot represents one individual and all individuals belonging to any of the four categories are included in the compilation; no sample was taken in any year. Insofar as the size of the dots permitted, an effort was made to place them on the appropriate side of each block.

Where two or more individuals of the same last name had occupations belonging to any one of the categories and resided at the same address, they were represented by a single dot. If two or more family members had occupations falling in different categories, the most prestigious category was the only one counted.
CHAPTER II

GROWTH OF MISSOULA, 1871-1965

Introduction

The purpose of this chapter is to provide an historical perspective for an examination of residential areas. Attention is given to those aspects of the city's history which were felt to have a particular bearing on the way the different residential areas developed. Since many important residential patterns were established quite early in Missoula's history and have carried through to the present, particular emphasis is given to the founding period, which terminated in approximately 1890.

Origins of Missoula

The history of white settlement in the Missoula Valley begins in 1857, when the first building were constructed.¹ Judge Frank Woody relates that he made the first attempt at

farming in the district that spring and in the fall of the year the first houses were erected. A trading post had been planned, but an Indian war in the Spokane and lower Nez Perce country cut off communications with the west and restricted further development until 1859. William T. Hamilton, a trader and government scout, was probably the first settler within the present day city limits of Missoula. In his journal of 1858, he declared his intention of one day opening a trading post near the mouth of Rattlesnake Creek. Although Coon was unable to determine the exact date, it appears that Hamilton did return and build a cabin at the mouth of the creek. In 1864 he sold his property and moved away.

In 1860 a military wagon road between Fort Walla Walla and Fort Benton was completed and opened. It became known as the Mullan Road after the Army Lieutenant in charge of its construction. In June of that same year Frank L. Worden and C. P. Higgins secured a sutler's license to trade with the Indians and started east from Fort Walla Walla with a stock of general merchandise. Higgins, as an Army Captain, along with Lieutenant Mullan, had originally passed through the Missoula area in 1853 as a member of Governor Isaac Stevens' expedition to make the first survey to determine the practicality of the route for a Northern Pacific

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2Tbid., p. 98.
4Tbid.
5Woody, "Early History of Western Montana," p. 98.
6Tbid., pp. 98-99.
Railroad. Stevens was governor of the newly created (March, 1853) Territory of Washington, which included all of Montana west of the Continental Divide.

Higgins and Worden had intended to locate in the Bitter-root Valley near Fort Owen, but when they arrived in the area they discovered that construction was in progress on a new Indian agency on the Jocko River. Unwilling to sacrifice the business of either Indian headquarters for that of the other, they decided to locate midway between the two, at a point a few miles west of present day Missoula. Their store formed the nucleus for a small village known as Hell Gate, which during its six years of existence, boasted a maximum population of fourteen.

During the early years, settlers trickled into the Bitterroot and Missoula Valleys from various sources. Some Indian traders and trappers found it profitable to trade livestock with emigrants on the Oregon Trail. They would take the foot-sore animals that the emigrants brought, fatten them up over the winter in the Bitterroot, and trade them the following year to new emigrants on "the road." Construction of the Mullan Road brought

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The remainder of the factual material in this section is taken from Coon's dissertation, pp. 42-74.

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The original Jocko agency was built in 1855 at the mouth of the Jocko, a number of miles farther north.

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Hell Gate's somewhat lurid history is suggested by the fact that during these six short years nine men managed to die there "with their boots on."
some men into the country who remained to farm and to mine, as did the government construction at the Jocko agency. Discovery of gold on the Salmon River in northern Idaho in 1861 and on the Kootenai River in Canada in 1864 brought hundreds of men through Hell Gate village.

Farm products sold for very good prices in those days and undoubtedly people were encouraged to take up farming. Gold discoveries in Montana proper drew thousands of immigrants into the territory during the 1860's and as a group they created a considerable market for agricultural products from Western Montana, especially wheat. Coon credits the overflow of drifters from the various Montana gold camps with providing a considerable impulse to agricultural development in the region. Unsuccessful at the mines, many men throughout the 60's and 70's gave up the search for easy wealth, took up land and settled down.

Seeing the need for a centrally located saw and grist mill, Worden and Company, in the winter of 1864 and 1865, erected a saw mill in the vicinity of what is today the parking lot for the First National Bank. The following year, when sufficient lumber had been produced, they built a grist mill immediately east of the saw mill. Water ditched from Rattlesnake Creek provided power for the mills. The saw mill appears to have been torn down sometime before 1871, as it does not appear on the property records of that time. As the town later was to grow up around the flour mill, it is evident that the location of Rattlesnake Creek was instrumental in determining the exact location of the future city. In this
connection it seems likely that the heart of the town might have developed even closer to the Creek had that large block of land not already been claimed, initially by W. T. Hamilton.

In the spring of 1865, the handful of settlers who were living at Hell Gate moved in a body to the new site, first called Missoula Mills. In the fall of 1865, Higgins and Worden relocated their store in Missoula Mills. Hell Gate at this time was the county seat of the newly created Missoula County. At the meeting of the Board of County Commissioners on November 11, 1865, the following entry was placed in the minutes book:

A petition was placed before the board by 64 persons asking the county commissioners to locate the county seat for the time being at a place known as Missoula Mills, near the mouth of Rattlesnake Creek.

The minutes of the meeting held February 6, 1866, bear a heading dated at Missoula Mills.

The little community quickly began to grow and take on the character of a center of trade, especially for the surrounding gold camps. In 1869, when gold was discovered at Cedar Creek, the town population was in the neighborhood of one hundred. This camp, being closer to Missoula than any of the others, had a more direct influence on the growth of the town. In 1870, a single year after the Cedar Creek discovery, the town population, according to the estimate of Will Cave, a resident of the period, had tripled to somewhere near three hundred.
Missoula in 1871

Missoula was entered from the public domain in 1871, and several records exist from and pertaining to that year which permit a close reconstruction of the town. Map 2 is a compilation of the information from these sources. The seventy or so buildings shown made up nearly the entire town; only a few others are known to have existed outside the map area.

The embryo town was not large enough to show any meaningful separation of categories of occupations. But the earliest separation between residential and commercial areas may be seen on the map, as well as the town's early orientation around the flouring mill on the corner of Higgins and Front Streets.

Continuing Development: 1871-1890

During the decade of the seventies, the small community did not grow at all. Population estimates for 1880 are the same as for 1870: about three hundred. The gold camps, on which the early town depended so heavily, began to decline in importance toward the end of the decade, as did the fur trading business. But the land in Missoula County under cultivation increased from sixteen to forty-two thousand acres during the same ten years.

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10 See Missoula County, Office of the Probate Judge, Original Deed Book, (two books with the same title); Missoula County, Office of the Clerk and Recorder, Deed Book A, pp. 43, 99; same office, Mortgage Book A, pp. 122, 156, 192; and Evelyn McLeod, "Early Missoula," (Seminar Paper, School of Journalism, University of Montana, 1927) (typewritten).

Map 2 - Constructed from 1871 property records. Locations of buildings are approximate. Variations in symbol size are based in part on property valuations but have no particular significance.
year period, without any increase in the total population of the county. This trend serves to illustrate the changing nature of the early economy away from mining.

The establishment of Fort Missoula in 1877 also picked up some of the slack in the economy caused by the decline in gold mining. The earliest garrison numbered forty-four. After the Nez Perce Indian War of the same year, the Fort was made permanent. In general, though, despite the fort, the five or six years prior to 1883 were years of economic stagnation--and waiting.

Like many other western towns, the most important single event in Missoula's history was the coming of the railroad. The completion of the Northern Pacific line in 1883 made it possible for the first time to exploit the area's large bulk resources, notably timber. The large copper deposits had been discovered in Butte the year before. They, as well as many other mining operations in western Montana, provided a large market for mine timbers, and the cheap transportation provided by the railroad made it possible for the timber-rich Missoula area to supply them. Agricultural products were also in demand at the mining centers and Missoula at once became the middleman in the flow of goods to and from the area's farmers, ranchers, and lumbermen. In addition, contracts for all supplies used in the construction of the railroad between Garrison and Thompson Falls--except the steel--went to Missoula firms and caused a large influx of capital for a ten year

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period; and the repair shops themselves brought to the city a sizeable number of new residents paid with out-of-town money. The period of boom and expansion that followed the railroad's completion lasted into the 90's; by 1890 Missoula's population had risen to 3,426--over a tenfold increase from 1880. In 1883, the town was incorporated as a city.

**Modern Development: 1890-1965**

1890-1903

During the first three years of the 1890 decade the general prosperity continued. A boom in land values all over the Northwest plus the possibility that the Great Northern Railroad might be built through Missoula drove building lot prices to record levels. Expansion to the south side dates from this period: Coon relates that in 1888 there was only one house south of the river. The total number of dwellings increased during the decade from 535 to 867.

In 1894 the national depression, following the panic of 1893, reached Missoula: land prices collapsed, one bank failed, metal mining slumped; and finally, according to Coon, a crippling railroad strike, "plunge(d) Missoula into the depths of a depression from which it did not emerge for about five years." The effect of this depression on slowing Missoula's rate of population increase during the 90's is shown in Figure 2.

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15 Ibid.
16 Ibid., p. 135.
Figure 2 - Population - City of Missoula 1870-1960
Missoula, by 1898, was beginning to work out of the depression. Construction begun on the University in June of 1898 signaled the revitalization of the local economy, and by the turn of the century another period of marked expansion was well under way. Expansion on the south side resumed, including the Orchard Homes development, which got under way just after the turn of the century. By 1903, the first few homes had just been built south of South Sixth Street and the north side School Section was not yet fully settled. A number of fashionable residences were being maintained in the downtown area.

1903-1925

From 1900 to 1910 Missoula experienced the fastest rate of growth in its history (see Figure 2). The commercial expansion of this period is credited by Coon to the following factors:

1. The shift in the nation's center of lumber production away from the lake states—which made the price of western lumber more competitive.

2. A reduction in freight rates—having the same effect.

3. The consolidation of timber holding by large companies.

4. Railway and other construction in Montana (including

17Ibid., p. 144.

18Ibid., p. 179. Twenty-five hundred acres of fertile, irrigated property in the present Orchard Homes vicinity were divided into five acre tracts and offered for sale as market gardens. About three hundred tracts were eventually sold, most by 1910,
the Milwaukee Railroad, which reached Missoula in 1909)—which served to further stimulate the lumber industry.19

After 1910 the economy stabilized. The war years brought no great expansion due to the lack of war-related industries. Likewise, there was no postwar depression. Between 1910 and 1925, farming and lumbering grew steadily in importance in the area as a whole, and after 1915 the flour milling and meat packing industries in Missoula grew considerably. Other plants were also established during this period—as for example, the Missoula White Pine Sash Company, started in 1920—reflecting the area's increasing ability, from the standpoint of numbers of people, to provide a market for some locally produced goods.20 In 1908, Missoula became the official center for the Northern Rockies District of the Forest Service.21 By 1925 the city contained 3,526 dwellings.22

This period was also the heyday of Missoula's streetcar system. At its peak the railway system covered twenty-two miles. The electrified system supplanted, in 1910, the older horse drawn line; its first route was from the Northern Pacific station south on Higgins to Connell, east on Connell to Maurice, south on Maurice through the University campus to Evans, west on Evans to Ronald, and south on Ronald to the end of the line at Sussex.

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20 Ibid., pp. 278-279.
22 Coon, "Economic Development of Missoula, Montana," Appendix, Table 1, p. 380.
Other routes reached nearly every part of town and went as far as Bonner. By 1931 the streetcar system had been abandoned in favor of buses.\textsuperscript{23}

By 1925, South Missoula was fully settled approximately as far south as Beckwith Street. The School Section had filled in nearly as far as it ever would. Many of the laborers in the School Section were employed by the Missoula White Pine Sash Company and the railroad. West side development was under way by 1925, and the street cars were making regular runs through the area. Polley's Lumber Company and the Northern Flour Mills were two of the largest concerns which provided local employment south of the river in the west side area. But as will be noted from the following list of average monthly payrolls for the larger enterprises operating in Missoula in 1923, nearness to place of work was probably not a crucial element in the development of the west side as a residential district for the city's laboring population.

<table>
<thead>
<tr>
<th>Enterprise</th>
<th>Monthly payroll</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.C.M. Lumber Co. (Bonner)</td>
<td>$110,000</td>
</tr>
<tr>
<td>Fort Missoula (Fourth Infantry)</td>
<td>19,000</td>
</tr>
<tr>
<td>Missoula Mercantile Co.</td>
<td>24,000</td>
</tr>
<tr>
<td>Missoula White Pine Sash Co.</td>
<td>8,000</td>
</tr>
<tr>
<td>Missoula Publishing Co.</td>
<td>12,000</td>
</tr>
</tbody>
</table>

As the population graph (Figure 2) testifies, Missoula has experienced a sustained rate of growth since about 1930. This rate has been greater than both the state and national growth rates. Even the Great Depression had only a minimal effect on the economy; government sponsored projects aided in providing employment and resulted in a number of civic improvements, including five new buildings and annexes at the University, improvements on many city parks, and the construction of the County Airport.\(^{25}\)

Population figures for Missoula County for the period following 1930 show a rate of growth even greater than the city's. This indicates the recent trend in Missoula toward suburban living.\(^{26}\)

Since World War II, a building boom has been in progress, especially on the south side, and in addition to hundreds of new homes, a new

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high school was built on South Avenue and a large shopping center complex sprang up along Brooks Street. 27

The economy continued to be based largely on the region's agricultural and forest products. Associated industries including a beet sugar factory, a pulp mill, and a plywood producing plant came into being during the period to provide employment for many hundreds of people.

CHAPTER III

THE DEVELOPMENT OF RESIDENTIAL AREAS
IN MISSOULA: 1890-1965

Introduction

This chapter presents the results of the research described in Chapter I. Residential areas are considered in terms of categories of occupations and a series of dot maps displays the evolving residential patterns.

As the raw data presented in the dot maps is somewhat difficult to interpret, an introductory section precedes the maps which is intended to clarify them. Prominent features of the growth patterns are then examined in light of the historical developments related in the previous chapter.

Areas of dominance

Maps 3 through 12 display the distribution, throughout the city, of the four occupation categories during five different years between 1890 and 1965. In order to make maximum use of these maps, it is helpful to view them in terms of areas of dominance.
area dominated by one or another category of occupations would simply be an area containing a heavier concentration of dots of one category than any other, were it not for two considerations. First, the number of dots in a particular area will tend to be greater, and that area will tend to appear dominant for one or another category—even if it is not—if the concentration of dwelling units there is greater than the city average. Secondly, the individual dot maps being compared are composed of differing numbers of dots; therefore, a relatively dense cluster of dots on a map with a large sample may be no more significant than a relatively sparse cluster on a map with a small sampling of dots. In analyzing the maps, these considerations should be kept in mind.

Data for dwelling unit density for 1965\(^1\) show a concentration of dwelling units in the area immediately bordering the central business district, and a predictable decline in density toward the outskirts of the city. The central business district and the area immediately adjacent to the south side shopping center complex also show light densities of dwelling units. Most of the rest of the city has an intermediate density of eight to twenty-four dwelling units per block, and no discernable pattern in the arrangement of the blocks with the higher and lower densities. It is probably safe to assume that this general pattern also existed in earlier years: that a fairly high density of dwelling units

\(^1\)"Comprehensive Development Plan," Figure 7, p. 30.
existed near the central business district, a low density near the city's edge, and intermediate values in between.

Thus, an area cannot be considered dominant for a particular Category X unless 1) the dot pattern for Category X shows a tendency to cluster in that area, 2) no other category shows a tendency to cluster in that area; or, if it does, its clustering pattern is noticeably weaker than that of Category X, strength being based partially on the total number of dots on the map, as explained above, and 3) the supposed cluster is a real one, and not a consequence of there being a high concentration of dwelling units in that area.

Areas of dominance so defined can be identified in all the following maps, though some are more conspicuous than others. Two maps of each of the final four subject years are presented: the first shows the basic dot patterns for the four categories; the second, a highlighted version of the first, attempts to identify all areas where a particular category is dominant over the other three. The highlighted areas of dominance were, of course, subjectively determined, and some are perhaps questionable. Rather than an attempt at positive identification of specific areas, the shading was made as an aid in interpreting the data and as a means of facilitating later discussion.

\[2\text{In addition to the guidelines listed above, the shaded areas were made mutually exclusive in any given year; when two categories (but only two) showed an equal tendency to dominate a given area, the area was shaded as dominant for the lower status category.} \]
Additional observations on the nature of the dot patterns

Interpretation of the data presented on the maps that follow will also be facilitated by a preliminary consideration of some of the inherent characteristics of the dot patterns. This section discusses the dot patterns per se—without reference to any particular areas defined by them.

First, it will be evident that some areas shaded as "areas of dominance" are more clearly defined than others. Naturally, the more strongly defined a dot pattern is, the more reliance may be placed on it as an accurate indicator. Unfortunately, no firm dividing line between "strongly defined" and "weakly defined" exists; and it is not certain that the most weakly defined pattern may not be significant. In reference to the existing dot clusters then, some attempt will be made to indicate in the discussion the degree of certainty involved, and discussion will be limited, to a large degree, to the more pronounced cluster patterns. The significance of areas which fall into none of the four categories will be discussed below.

Of the four categories, the dot patterns for Category 3 seem to show the least tendency to cluster. This may be taken to mean that either a poor definition of social class was originally made, or that the lower middle class does not tend to congregate in specific sections of the city. There is some evidence to favor the former explanation.
A peculiarity of the dot maps is the tendency for the cluster patterns of some categories to regularly overlap others. Certain combinations are more common than others: concentrations of Category 1 dots are often found in conjunction with Category 2 dots; and clusters of Category 3 dots are commonly associated with Category 4 dots; but there are few, if any, significant cases where Category 2 and 3 clusters coincide. Now, as Chapter I explained, an attempt was made to choose the representative occupations in such a way that four distinct social classes would be defined. On the basis of SET values, this attempt appeared reasonably successful. The cluster patterns, however, although very clearly recording a two-fold division in the city's residential fabric, are considerably less successful in delineating four distinct kinds of neighborhoods. It is not possible to say whether the original category definitions are responsible for the final indistinctness, or whether it is a result of the unconforming choice of residential location exhibited by (accurately defined) social classes. Probably both factors are in part responsible.

The socioeconomic forces which govern the choice of a residential location in American cities are not particularly strong, especially for those who for appearance's sake (or whatever reason) become determined to overcome them. This being the case, it is perhaps reasonable to expect a greater invasion of Category 3 individuals into Category 2 areas than the data exhibits. The best explanation of why this does not occur is that the social separation between
the two categories is greater than was supposed—that Category 3, as defined, is actually somewhat closer to Category 4 than Category 2.

Extent of residential areas

Missoula's city directories have long proclaimed that Missoula is "essentially a city of homes." Historically, this has been the case. Missoula's function as a trade and distribution center has been its raison d'etre, and only since about World War II has manufacturing assumed more than a minor role in the economy. Consequently, the city's residential areas have remained essentially unbroken by large industrial complexes, and the labor force has changed in composition only very gradually. The important exception to this last statement is, of course, the Northern Pacific Railroad and the impact it had on the early town. For many years, the largest single employer in the city was the railroad; its passage through the young town created a basic division in the town fabric, and initiated a new node of settlement near the station and repair shops. The Northern Pacific Railroad, including the Bitterroot spur, and the Clark Fork River are the only large scale features that break up the large, central residential mass. Small scale features—the University, various timber related activities, Rattlesnake Creek, and the Milwaukee Railroad—tend to lie on the outskirts of the city or are co-joined with the large scale features. Strip developments on U.S. highways 93 and 10 appeared during the

final subject period and were responsible for some fragmentation, but by and large the residential mass of the city, throughout its growth, has been either continuous, or interrupted only by the river or the Northern Pacific tracks. The central business district has always served at least partially as a residential area; and due to the nature of the method used here, it was not necessary to exorcise it as an unrelated district, from the general data.

Growth Patterns

Missoula in 1890

Maps 3 and 4 are the first attempts to employ the occupation category mapping scheme. The data source for these maps is the first Missoula city directory, published in 1890. Houses were not numbered in this directory in the present-day manner and as a consequence, the dot locations are much more uncertain than any of the later maps. The locations of the Wright and Woodward numbers were estimated by comparing the old and new addresses of a sample of seventeen residents who appeared to be living at the same place in 1903 as they had been in 1890. This sample of known locations provided a loose framework within which the rest of the 1890 addresses were plotted. In those sections of town where there were still no street addresses, the number of individuals in the two categories are shown by a number on the map,

\[^{4}\text{Missoula City Directory (Place of publication unknown: Wright and Woodward, 1890).}\]
Map 3 - Distribution of Category One Individuals in Missoula 1890

n = 50

5 OR MORE INDIVIDUALS AT A SINGLE ADDRESS
Map 4 - Distribution of Category
Four Individuals in Missoula
1890

n = 119

- Rattlesnake: 4
- South Missoula: 4
- School Section: 23

● 5 or More Individuals at a Single Address
placed in the appropriate section of town. Because of the small sample, as well as the uncertainty in achieving exact placement of dots, only the two extreme categories were examined.

In 1890, differentiations in the choice of residential locations first became apparent. Despite the limited reliability of the data, a separation of the extreme categories is rather pronounced, with Category 4 dominating the region north of Toole Avenue and the railroad tracks and Category 1 certain sections of the downtown area. Thus, the first expansion of the town away from the original townsite was made by the lower status group. This expansion was probably not so much a case of a transference of people from a pre-existing settlement as it was the creation of new housing for the immigrating railroad workers, who swelled the town's populations through the 1880's. To induce the Northern Pacific to build their facilities in Missoula, C. P. Higgins, the original owner of 160 acres in the downtown district, gave the railroad outright more than enough property on which to build. The property not occupied by the railroad facilities was divided into building lots and sold\(^5\) --probably at reasonable prices to their own employees. This was, no doubt, the way in which the north side became immediately dominated by workers of low social status. The pattern established has not changed since: the north side of town has been continually dominated by Category 3 and 4 workers.

Another feature that stands out is the concentration of Category 4 people in the First and Second Street areas (today, Kiwanis and Le Vasseur Streets). In 1871, this area was totally undeveloped; it is low lying and probably was a quite undesirable location before the river became adequately diked.

The better residences seem to have been located along East Pine, East Cedar (Broadway), East Main, East Front, and on certain blocks of West Cedar. It is possible to discern from Map 3 and 4, a semi-circle of good quality residences surrounding the original commercial nucleus (see Map 2), with poorer districts to the west and south. This was the basic pattern, upon which the railroad and its contributions to the town's structure, was superimposed.

It is also interesting to note that although the South Missoula land boom was under way by 1890, no residential patterns had yet emerged south of the river. It is reasonable to suppose that the dominant factor which decided the character of at least the eastern portion of the south side was the decision to build the University there. At least the two events coincided temporally; during the thirteen year period following 1890, the University was founded and a Category 1 area sprang up in close proximity.

Modern development: 1903-1965

By 1903, Category 2 had moved south across the river too (see Maps 5 and 6), but its heaviest concentration was still in the downtown area. The evacuation of the downtown area by Category 1 and 2
Map 6 - Distribution of Different Categories of Occupations in Missoula - 1903

- Category 1: n = 82
- Category 2: n = 123
- Category 3: n = 97
- Category 4: n = 150
Map 6 - Distribution of Different Categories of Occupations in Missoula - 1903

Category 1

n = 82

Category 2

n = 123

Category 3

n = 97

Category 4

n = 150
occupational groups was a gradual process, not fully completed until after 1948. In the earlier years, until 1948, many of the Category 2 dots in the downtown area represent merchants who resided at their place of business; in a sense then, these downtown patterns represent something other than purely residential districts of homes and apartments.

Although Category 4 continued to dominate much of the north side in 1903, there is evidence, in the form of a Category 3 cluster, to suggest that the southern portion of the School Section was somewhat superior in housing quality to the area to the immediate northeast. If it was, the distinction did not survive. Even by 1925, almost the entire north side had assumed the (dot) characteristics of a Category 4 area (see Maps 7 and 8). The interim period between 1903 and 1925 was one of increased demand by the lumber industry for labor. While much of the work at this time was to be found in or near the north side School Section, as much was found elsewhere, and settlement of labor in the area was only in small part due to the area's proximity to the places of employment. The north side residence pattern, nearly stable by 1925, did not change noticeably in the next forty years: in 1965, its areal extent and occupational clustering pattern was practically unchanged from 1925. The north side pattern is one of the most definite found in the study. Without much doubt, the north side has always provided the domicile for a large proportion of the

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Map 7 - Distribution of Different Categories of Occupations in Missoula - 1925

Category 1: n = 209

Category 2: n = 259

Category 3: n = 208

Category 4: n = 733
Map 8 - Distribution of Different Categories of Occupations in Missoula - 1925

Category 1

Category 2

Category 3

Category 4
city's lower class workers; and quite likely, housing conditions there have always been below the city average.

The other consistently well-defined residential pattern is the Category 1 district centered near the University. This area has not changed in character since it became fully defined about 1925. University professors have consistently inhabited this section in significant numbers and the University has no doubt been a stabilizing factor in the persistence of the Category 1 pattern here. This is not to say that the University district has been exclusively or even predominantly the domicile for University people; on the contrary, ever since 1925 many of the city's leading businessmen and professional people have also resided there.

Category 2 is also strongly represented in the University district. The dot patterns suggest that, between 1925 and 1948, the principal node of Category 2 dominance shifted away from the center of town to reestablish itself directly south of the University district. This reversal of the relative positions of the Category 1 and 2 centers supports the idea that the University acted as a stabilizing influence on the surrounding neighborhoods. In 1965 it appears that Category 1 may have gained strength in this southern section, but the evidence that this has been the case is less than conclusive. If it is the case, however, that Category 1 made an inroad on Category 2 territory, this represents practically the only example in the city's development of an area being upgraded after the original settlement.
Map 9 - Distribution of Different Categories of Occupations in Missoula - 1948

- Category 1: n = 268
- Category 2: n = 308
- Category 3: n = 399
- Category 4: n = 511
Map 10 - Distribution of Different Categories of Occupations in Missoula - 1948

- Category 1: n = 268
- Category 2: n = 308
- Category 3: n = 399
- Category 4: n = 511
Several areas have been downgraded. Portions of the west side have altered in character from an indefinite status, to a Category 3 status, and finally, to a Category 4 status between 1925 and 1965. But the west side, within the city limits, has, since its settlement, been predominantly a lower class area. The most interesting example of downgrading can be observed immediately south of the river, straddling, but especially to the west of, South Higgins Avenue. Since 1903, when this area was one of the town's most fashionable residential districts, it has progressively downgraded until, by 1965, the westernmost portion of it came close to being dominated by the Category 4 occupational class. Although the city as a whole has few features which support Burgess' theory of concentric zones, the area last mentioned resembles somewhat Burgess' "zone in transition": in particular, business functions are encroaching on the area and the residential function seems to be "deteriorating." This resemblance is noteworthy from the standpoint of future growth, because as Burgess points out, the so-called "zone in transition" in larger cities is often the seat of slum and crime problems.

The post-World War II building boom on the south side is quite evident in the dot patterns. Although all occupational categories participated, most newly settled areas by 1965 were more or less provinces of the two more prestigious categories. The Farview

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Map 11 - Distribution of Different Categories of Occupations in Missoula - 1965

n = 459

Category 1

n = 259

Category 2

n = 407

Category 3

n = 635

Category 4
Map 12 - Distribution of Different Categories of Occupations in Missoula - 1965

Category 1

Category 2

Category 3

Category 4
area is particularly striking in this respect: in 1965 only one resident of the area belonged to either Category 3 or 4.

This period of building and growth also resulted in a classic example of the role a railroad can play in residential morphology. The rectangle bounded by Reserve Street, South Avenue, Russell Street and Fourteenth Street, is divided diagonally by the Bitterroot spur of the Northern Pacific Railroad. The western part of the rectangle was fully settled in 1948. The southeastern portion was settled after 1948. Maps 11 and 12 indicate a sharp distinction in residential conditions on the opposing sides of the tracks.

Finally, it will be noted that various areas are consistently unclassifiable as dominant for any particular occupational category. The south central portion of the city, including most of the Stephens and Bickford Addition (the area with streets aligned with Brooks Street), as well as several smaller areas fit this description. These mixed areas form a "normal" background for the study; they represent the condition one would expect to find if social classes did not tend to segregate into different neighborhoods. Almost all of the city is "mixed" in this sense to some degree--and indeed, it is the exception, when, as in the Farview area in 1965, some mixing between the two extreme social classes does not occur. In no sense does the existence or persistence of mixed, unclassified areas represent a failure of the technique to differentiate. Rather, it may be a strength of the dot pattern scheme.
that these areas are not rigidly and artificially classified as something they in fact are not. From the standpoint of urban pathology, mixed neighborhoods may well be a sign of health, and a condition to be actively promoted.
CHAPTER IV

IMPLICATIONS OF THE OBSERVED RESIDENTIAL PATTERNS

Introduction

This chapter analyzes the material presented in the previous chapter from two standpoints. First, evidence is presented in support of the idea that the "areas of dominance" correspond with areas defined in terms of the structural condition of buildings. The evidence, due to the limited scope of this study, is suggestive rather than definitive. Second, the observed patterns of growth of Missoula's residential areas are examined in relation to the work of Homer Hoyt. If it can be shown that the structural units defined by this paper evolved in consonance with rules found to generally hold for all cities, then there will be additional reason to believe that the technique may be advantageously applied to a development study of any city.
Correlation of "Areas of Dominance" with Areas of Differing Structural Quality

Perhaps the most important question raised by the data of Chapter III is one of structure. How meaningful are the "areas of dominance" defined by the various dot patterns? Clearly, this question must be at least tentatively answered before the technique can be evaluated.

Residential subunits can be defined in many different ways depending on the purpose of the study. A business survey, for example, is likely to choose different units from those chosen in a study dealing with pre-school children. Studies like these utilize specialized units of measurement, each of which is valid and meaningful in its own context. A study of development, however, to be of greatest use, requires more generalized units of measurement, which produce a clear and comprehensive picture of "conditions within the city."

It has been a major purpose of this study to define morphologic units which in some way reflect the general condition or quality of neighborhoods. As a working hypothesis, it has been convenient to assume that prestigious neighborhoods—those areas inhabited by individuals with prestigious, or high status occupations—are also high quality neighborhoods, in terms of the quality of general living conditions, especially as they are reflected by physical conditions. It will be recognized that this relationship is not necessarily direct, but depends on a full definition of what constitutes high quality living conditions.
In a practical sense, the concept of "prestigious," 
"fashionable," or "nice" neighborhoods, is a meaningful one, and 
such residential districts are easily visualized. And it is also 
a useful concept, especially with regard to the changes in location 
of different type areas over time. Decisions regarding slum clearance projects, mortgage lending policies, and zoning policies are 
more effectively made in the light of a thorough understanding of 
the changing (or unchanging) physical quality of residential dis- 
tricts. Practical problems such as these have helped stimulate 
thought into the problem of defining neighborhoods of different 
character.

Homer Hoyt's method of defining 
residential structure

Homer Hoyt, in what is probably the definitive study of the 
structure and growth of American neighborhoods, used, in addition 
to rental values, such physical criteria as the total number of 
residential structures on each block thirty-five years old and 
older, the percentage of residential structures in each block in 
need of major repairs, and the percentage of dwelling units in 
each block without private baths, in order to distinguish between 
different types of neighborhoods.

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2Ibid., p. 34.
Individual maps were prepared which showed the distribution in the subject cities of eight "block characteristics," which were deemed to "throw the most light upon residential districts with respect to one another." Districts of different types could then be identified by superimposing the individual maps on each other and outlining the areas where selected class intervals coincided. For example, if it was desired to identify the lowest quality areas of a city, the blocks where the average monthly rent was less than fifteen dollars a month were shaded on a base map; then, on successive transparencies, areas were shaded which corresponded to 1) blocks in which twenty-five percent or more of the existing structures were in need of major repairs, 2) blocks in which seventy-five per cent or more of the buildings were at least thirty-five years old, and 3) blocks in which fifty per cent or more of the inhabitants were non-white. On a final transparency, those areas common to the four preceding maps were shaded. In this way, various combinations of block characteristics can be chosen to identify many specific types of areas in addition to areas having different gradations of general quality.

Because of the vast amount of data involved, Hoyt's multi-factor approach to the structure problem is quite convincing. Other

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3Ibid. Besides the four block characteristics already mentioned, the following were mapped:
1. Percentage of dwelling units that are owner-occupied.
2. Percentage of persons that are of a race other than white.
3. Percentage of dwelling units having no central heat.
4. Percentage of dwelling units that are overcrowded.

4The lowest class interval for rent in 1934.
writers on the subject, since Hoyt, have by and large accepted his methodology, and have either confined themselves to criti-
cizing his conclusions, or have "tested" his sector theory with various single-factor techniques.\(^5\)

Any multi-factor approach to defining structural units requires a great deal of data, which often is not available. Hoyt recognized this, and sought to provide an acceptable substitute for his basic technique in order that similar investigations could be conducted easily and with a minimum of data. He found that the factor which, by itself, most closely approximated the results of the combined data of all the block characteristics was the average rental values. Chapter IV of his monograph is devoted to a demon-
stration of the degree of correlation between rental values and the other block characteristics. Tables were constructed which showed the per cent distribution in a sample city--Richmond, Virginia--of blocks having different characteristics (e.g., "blocks with no structures in poor condition," "blocks with some structures in poor condition," "blocks with all structures in poor condition," etc.), which fell in the various rent categories. Thus, each block characteristic was shown to bear a regular relationship to the

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primary indicator, average block rental. This correlation technique is of interest because in a limited way it may be applied to the study at hand.

A partial test of the occupational technique of determining residential structure

Detailed data for block characteristics in Missoula have not been compiled to any great extent; and until extensive work is carried out no definitive analysis of the city's structure will be possible. The 1965 field survey that accompanied the comprehensive plan did, however, produce one map useful in testing the validity of the occupational technique. Figure 6 of the comprehensive plan, reproduced herein as Map 13, displays the condition of structures in 1965. The map was compiled from a field survey—an exterior evaluation of age, condition, and general maintenance—of 11,966 structures, 10,752 of them residential. Blocks are divided into five different categories, depending on the percentage of structures in each block below average for the city as a whole. Now, as noted above, it is reasonable to expect that individuals in the high status occupation groups will tend to reside on the better quality blocks, and low status groups will tend to be found on the blocks of poorer quality. If such a correlation could not be demonstrated, the concept of occupationally dominated areas would be severely limited in usefulness.

Map 13 - Condition of Structures in Missoula - 1965

Legend
Percentage of structures below average:

- Less than 1%
- 1 to 19%
- 20 to 49%
- 50 to 79%
- 80 to 100%
The condition of structures map shows a high degree of visual correlation with the occupational dot maps for 1965 (Maps 11 and 12) so far as the general location of the high and low categories are concerned. A slightly more refined test can be made by counting the number of dots of each occupational category which fall on the different types of blocks, and computing percentages in much the same manner as Hoyt did in his chapter validating the abbreviated rental value technique. These results are presented graphically in Figures 4 through 7. The graphs clearly show the shift in residence patterns between the different occupation categories. Figure 3 represents the approximate distribution of all city residents, and is superimposed over the other graphs to show more clearly deviations from average conditions. Figure 3 was constructed by measuring on Map 13 the approximate percentages of residential areas which fell into each of the five categories. The areal percentages were then converted directly to population percentages by assuming that Missoula's population is evenly distributed throughout the city. As noted earlier, this is not quite the case; but deviation from a regular distribution is probably not great enough to seriously affect the percentages of Figure 3. The density of population is probably greater on the poorer quality blocks; therefore, any error in Figure 3 is probably a slight upward skewing in block Categories 1 and 2 and an inaccurate depression of Categories 3 and 4.

The two sets of data correspond closely, thereby supporting the idea that the distribution of different occupational categories
Figures 3-7 - Percentage Distribution of Missoula Residents on Various Types of City Blocks 1965

Block Categories:

1- Those blocks with less than 1% of structures in below average condition

2- 1 to 19% of structures below average

3- 20 to 49% of structures below average

4- 50 to 79% of structures below average

5- 80 to 100% of structures below average
is a true reflection of housing quality. As mentioned previously though, the evidence is too sketchy to claim more than a tentative validity for the method.

Correlation of the Findings with Homer Hoyt's Rules of City Development

The following sections investigate the relationship between Missoula's residential development and Homer Hoyt's sector theory of development. Comparisons are most easily made if the development of each individual category of occupations is viewed separately. Accordingly, Maps 14 through 21 focus on the four individual categories and present their development through a sixty-two year time span. As with the maps for the individual years, two maps are included for each occupational category, one showing the unadorned dot patterns, and the second highlighted to point up areas of dominance.

Homer Hoyt's monograph concludes with a discussion of the general nature of developing residential patterns. In this final chapter, he advances several rules which, in various combinations, seem to govern the development of high grade residential districts in American cities. By comparing these generalizations with the development patterns found to have occurred in Missoula, some further insight will be gained into the forces that are responsible for the latter.

Hoyt focused on the high rent districts because he considered them the most important in defining the residential structure.
Map 14 - The Change in Distribution of Category One Occupations in Missoula from 1903 to 1965

1903

n = 82

1925

n = 209

1948

n = 268

1965

n = 459
Map 15 - The Change in Distribution of Category One Occupations in Missoula from 1903 to 1965
Map 16 - The Change in Distribution of Category Two Occupations in Missoula from 1903 to 1965

n = 123
1903

n = 259
1925

n = 308
1948

n = 522
1965
Map 17 - The Change in Distribution of Category Two Occupations in Missoula from 1903 to 1965

1903
n = 123

1925
n = 259

1948
n = 308

1965
n = 522
Map 18 - The Change in Distribution of Category Three Occupations in Missoula from 1903 to 1965

n = 97

n = 208

n = 399

n = 407

1903

1925

1948

1965
Map 19 - The Change in Distribution of Category Three Occupations in Missoula from 1903 to 1965

<table>
<thead>
<tr>
<th>Year</th>
<th>n Value</th>
</tr>
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<tbody>
<tr>
<td>1903</td>
<td>97</td>
</tr>
<tr>
<td>1925</td>
<td>208</td>
</tr>
<tr>
<td>1948</td>
<td>399</td>
</tr>
<tr>
<td>1965</td>
<td>407</td>
</tr>
</tbody>
</table>
Map 20 - The Change in Distribution of Category Four Occupations in Missoula from 1903 to 1965

1903

n = 150

1925

n = 733

1948

n = 511

1965

n = 635
Map 21 - The Change in Distribution of Category Four Occupations in Missoula from 1903 to 1965

1903
n = 150

1925
n = 733

1948
n = 511

1965
n = 635
In his words, the high rent areas of a city are the peaks or ridges toward which all other rental areas slope upward. The intermediate rental areas usually surround or adjoin these high rent areas, and hence their shapes are often regulated by those of the high rent areas.7

In addition, the high rent area of a city "tends to pull the growth of the entire city in the same direction."8 As has been noted, the Category 1 areas of this study—which correspond to Hoyt's "high rent areas"—are quite well defined on all the maps, and as a result, errors or ambiguities resulting from a questionable interpretation of Missoula's development are minimal.

Following is a brief discussion of the degree to which each of Hoyt's major points relates to the Missoula study. The overall correspondence is close, even though some of Hoyt's conclusions are applicable only to major cities and hence are not descriptive of Missoula's growth. This correspondence to some degree serves to validate the occupational technique of residential measurement while also lending support to Hoyt's conclusions.

**Origin of the high grade residential area.**—9 In all the cities studied by Hoyt, the high grade residential district had its origin near the retail and office center of the town. In all

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8Ibid., p. 114.

9Underlined headings in this section are from Hoyt, *ibid.*, Part II, Chapter IV - "The Pattern of Movement of Residential Rental Neighborhoods," pp. 112-122. The first three headings are general in nature and are thought to apply to all cities; the last nine are more specialized, as noted in the text.
cases, whatever industrial or wholesaling activities existed were located at the point farthest removed from the high grade residential area. This pattern can be observed in Missoula. The incipient high grade areas along Pine, Cedar, and Front Streets (see Map 3) atrophied after the railroad was built and the new, "better" homes were built south of the river, well away from the hustle and bustle of the railroad and its repair shops, but still near the retail district where the higher income residents worked. Again, the railroad is pointed to as the chief formative element in the city's development. If, for any reason, the railroad had chosen a route along the south bank of the river, it is quite reasonable to suppose that the present day city would be structured completely differently from the way it is.

The high rent neighborhoods of a city do not skip about at random in the process of movement—they follow a definite path in one or more sectors of the city. This is another characteristic found to be true for all cities. It quite obviously has been the case in Missoula. As Maps 14 through 21 show, not only does the high grade district tend to expand within its original sector, but the lower grade districts do likewise. All data together strongly supports the so-called sector theory of residential development. After the original orientation had been established, it is clear that the high, low, and mixed status districts in Missoula expanded radially from the old town center at Higgins and Front Streets.
Intermediate rental neighborhoods tend to preserve their stability better than either the highest or lowest rental areas.--

This statement, written in 1939, is based on the assumptions that 1) the highest grade housing is too expensive for any but those with the highest income levels to maintain; therefore, when the high income groups move out to the newer fashionable areas, the large stately homes will become broken up into apartments or be turned into small factories, and the area will thus immediately deteriorate; and 2) the lowest grade housing is so poor that buildings tend to become condemned and destroyed as the residents gradually move toward the periphery of the city. Intermediate areas are of such a character that the homes can be successfully maintained and passed on in due course to new arrivals from outside the city and to those groups from poorer sections of the city on their way "up and out." Whatever the merits of this argument in light of present day trends in house style and maintenance costs, the predicted (relative) instability of high and low grade housing is not born out by the data for the Missoula example. Most areas in Missoula, with the one exception noted earlier, have either remained quite stable since their original settlement or have downgraded only slightly. Maps 14 and 15 show particularly well the unchanging nature of the Category 1 area adjacent to the University through a sixty-two year time span. One factor which may have contributed to the apparent city-wide stability is the growing rental market produced by the University. Student
housing, while seldom luxurious, is usually adequate to protect against all the elements; it is possible at least, that the pressure created by this market has served to significantly reduce the number of older buildings which have fallen into disrepair.

High grade residential growth tends to proceed from the given point of origin, along established lines of travel or toward another existing nucleus of buildings or trading centers. This rule, along with the eight following, do not necessarily apply to every city. Some combination of them, however, governs the pattern and direction of high grade growth in all cities. This rule was derived from observations of the growth of major cities served by a network of roads which themselves were unimpeded by natural obstructions and along which independent development of smaller communities was occurring. In the Missoula region, the early roads were restricted to the low lying valley areas, as were the railroads; consequently, it isn't surprising to find that the high grade districts developed elsewhere, away from the railroad.

The zone of high rent areas tends to progress toward high ground which is free from the risk of floods, and to spread along lake, bay, river and ocean fronts, where such water fronts are not used for industry. This statement might have been reworded to the effect that high grade neighborhoods tend to expand to take full advantage of available scenic resources. In this respect,
the entire city of Missoula is well endowed. Only in the final period was the high ground south of the city and in the West Rattlesnake area utilized for residences. As predicted by the sector theory, the first invasion of high ground was by the more well-to-do residents.

High rent residential districts tend to grow toward the section of the city which has free, open country beyond the edges and away from the "dead end" sections which are limited by natural or artificial barriers to expansion.--The earliest (1890) Category 1 development was restricted by barriers on all sides: the railroad to the north and west, the mountains to the east, and the river to the south. Once the river was crossed, the southward development of the high grade area proceeded toward what was then open country (Map 15). The eastern portion of the valley floor is now fully settled. So, future development (after 1965) of high grade areas may be expected, on the basis of this and the preceding rule, to progress toward the relatively open country of the Bitterroot Valley, by way of available high ground.

The higher priced residential neighborhoods tend to grow toward the homes of the leaders of the community.--The question of whether or not this rule has applied to Missoula's development must remain unanswered by this study. Historical information on who "community leaders" were at any given time, the exact dates they built new homes, and their relation the the surrounding homes
are all necessary; and this information is attainable only by extensive independent research.

**Trends of movement of office buildings, banks, and stores, pull the higher priced residential neighborhoods in the same general direction.**—Hoyt explains that what is meant by this statement is that offices, stores, and banks move in the same general direction as high grade residential districts, but either may initiate the movement. Missoula by 1965 had developed a shopping center complex which had already begun to sprawl along Brooks Street from about Mount Street to South Avenue. As can be seen on Maps 14 through 17, this area is in close proximity to Category 1 and 2 residential districts. Here is another case where Missoula conditions align with a national trend first identified in 1939.

**High grade residential areas tend to develop along the fastest existing transportation lines.**—It is doubtful whether this factor had any bearing on the development in southeast Missoula. Although an electrified streetcar line penetrated the district as early as 1910 and terminated at Sussex Street—which at the time was an area of open fields—the line was in service over many other parts of town as well, and there is no reason to believe that it had a special effect on promoting any particular area. As for roads and streets, Missoula simply hasn't sprawled enough for distance from work to ever have been a factor in determining

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residential locations. This is a consideration which may prove effective in altering future growth patterns, but as yet, has had little effect.

The growth of high rent neighborhoods continues in the same direction for a long period of time. --Long periods of time, to Hoyt, meant approximately one hundred years. The generally southward trend of Missoula's high value neighborhoods has been in evidence for about sixty-five years and shows no signs of weakening.

De luxe high rent apartments tend to be established near the business center in old residential areas. --This trend, which Hoyt terms a special case and observed in only a few large metropolitan centers, is not in evidence in Missoula.

Real estate promoters may bend the direction of high grade residential growth. --Hoyt believes that real estate promoters cannot create new trends in growth of high grade neighborhoods, but may accelerate or modify existing "natural" trends. Since the high grade residential district in Missoula never deviated from its original course, it is evident that no new major residential trends have been created. But developers have been active in Missoula, and one of the most interesting--and significant--questions left unanswered by this paper is the role original owners and developers have played in modifying all the evolving patterns, low grade as well as high. The Farview area,
for example, was and is a rather large scale development. In 1948, before a single house had been built in the Farview vicinity, advertisements in the city directory hailed it as the area "where the better homes will be built." Promoters of out-of-town developments in adjoining valleys have in recent years taken advantage of the suburban trend made possible by the automobile and good quality roads. In doing so, they have no doubt modified somewhat the distributions within the city--but it is not possible to say precisely how.
SUMMARY AND CONCLUSIONS

Methodology

A technique was devised to identify residential areas where individuals of different social status tend to concentrate. The evidence available indicates that the occupational "areas of dominance" so identified correspond closely with areas definable in terms of physical criteria—specifically, quality of housing. The evidence, however, is limited in extent, and only a tentative relationship can be claimed.

The exact relationship between the areas of dominance and any physical criteria is, in a sense, incidental, as the occupational areas may be considered valid morphologic units in their own right. For some purposes it may well be as useful to know the distribution patterns of different social classes as the distribution of any factor, or combination of factors, which relate to housing quality. For example, if subsequent research shows that mixed or intermediate type areas, as defined above, exhibit a greater stability than more homogeneous areas, identification and promotion of areas of this type will be facilitated by a knowledge of occupational distributions. Also, the dot distributions, in
identifying people rather than property characteristics, exhibit an organic quality and, possibly, a responsiveness to change not inherent in other devices used to identify residential subdivisions. These considerations notwithstanding, it is still reasonable to assume that in the main, areas occupied predominantly by high social status groups will be areas of high value, high quality housing, and areas dominated by low status groups will be characterized by low value, low quality housing.

More confidence can be placed in the gross, high-low areal distinctions than the distinctions between areas dominated by the individual categories. The distributions suggest that there is a greater social separation between Categories 2 and 3 than between 1 and 2, or 3 and 4; but the method would have to be reapplied using a different series of occupations for Categories 2 and 3 before it could be said with assurance that the categories as used in this paper are ill-defined. It may well be that the degree of segregation of social classes in Missoula is simply not great enough to create more than a two-fold division of the city's residential fabric. The value of the technique as an analytical tool decreases only slightly if it can identify only three distinct classes of neighborhoods (high status, low status, and intermediate); further distinctions are at best of limited value to the urban analyst.

The major advantage of the technique is its adaptability to development studies. Most American cities no doubt have data available in the form of city directories for periods quite early
in their history; in fact, it is doubtful whether in many cases any other source of data exists which contains the detailed information necessary for a study of residential development. In the development section of his monograph, Hoyt depended on information gleaned from old inhabitants in reconstructing the neighborhood character of cities in past years.\(^1\) A sample of older residents were asked to outline on city maps those areas where rent was highest and lowest for specified years. The individual maps were then compiled to produce a single map. The advantages of using data from city directories over this method are apparent: 1) it is possible to go farther back in the city's history, 2) the data are more uniform, 3) finer distinctions can be made, and 4) the associated methodology is much less cumbersome and time consuming because little field work is involved.

**Development of Missoula's Residential Areas**

The analysis technique was then applied to a study of the growth and development of residential areas in Missoula. The study indicated that, in form, Missoula's residential development proceeded in accordance with Hoyt's sector model. Once a particular type of neighborhood became established, it tended to expand radially outward from the city center within the same sector. Missoula, significantly, did not demonstrate the downgrading of older, more central fashionable areas that most of the cities in

\(^1\)Hoyt, *Residential Neighborhoods*, p. 114.
Hoyt's study showed—even though the period of observation was approximately twice that of the Hoyt study. The University is cited as a probable stabilizing influence, at least partially responsible for this effect. It is also conceivable that Hoyt's generalization—derived from a study of cities several orders of magnitude larger than Missoula—cannot be applied without modification to smaller cities.

It was not possible to establish with certainty the reasons the city's development has taken the particular direction it has. Explanations of causes that are in any sense fundamental involve such factors as original ownership, the availability of money for building purposes, development schemes, and, in later years, zoning restrictions. Due to the limited scope of this paper, these factors were not treated in detail. On a somewhat more superficial level, Hoyt's "considerations governing city growth" were seen to apply to Missoula more often than not. These generalizations help to clarify some aspects of the city's growth, even if they are not satisfactory as ultimate explanations. In particular, the critical nature of early events and decisions was brought out. The location of the original flouring mill and later, the route taken by the Northern Pacific Railroad were probably the two most critical factors in Missoula's development; they established trends and priorities in land use which over the years have never changed, except in areal extent, as the different sectors expanded radially.
The development study, in conjunction with Hoyt's observations on the persistence of patterns once initiated, makes possible identification of some current trends which may be expected to carry on into future years:

1. The area immediately southwest of the Higgins Avenue bridge is the only area in the city that, since 1903, has declined from a high grade residential classification to a low grade classification. Although other areas in the city show evidence of having lower quality housing, this area perhaps warrants special consideration because of its high rate of change in classification and its location on the rim of the "inner city," where deterioration often becomes a serious problem.

2. High grade residential development is moving southward vigorously. It will probably continue to do so, utilizing available high ground east of the Bitterroot River. Competing high grade developments in the Rattlesnake Valley and out of town may act to slow this trend.

3. A relatively low grade district has been established which embraces most of the west side. It may be expected to expand steadily westward.

4. North side development has lagged far behind the city as a whole, both in quality of housing and the number of new homes built. Apparently, the west side expansion is absorbing the occupational groups that might
be expected to expand northwesterly. Industrial land use and the county airport make this area one of the least attractive residential districts. Another factor inhibiting the development of this area and promoting further west side development is the south side shopping center complex which is readily accessible to west side residents. It is likely that the development of the north side will remain slow, despite its relative nearness to expanding sources of employment. If and when development comes, it may be expected to be of a low grade variety.

**Further Research**

The technique appears to be an accurate, easily applied method of analyzing residential structure and growth. It might be advantageously applied to a number of smaller American cities, which, like Missoula, lack real property inventories and census block data, but have available city directories dating back to the city's origin. Such studies, besides providing insight into the peculiarities of the subject cities which possibly could be of value in future planning, could only help promote the development of a more sophisticated theory of urban structure and growth.

Future research might also take into account and develop an additional feature of the technique. It will be noted that if the dot patterns for a particular year were consolidated on a single map—with the different category dots identified by different colors—and the street grid then removed, the resulting pattern of
dots would closely resemble the plots sometimes utilized as basic data by plant ecologists to analyze plant communities. While it is obvious that any strict analogy between plant communities and communities of people will break down upon even a casual inspection, basic concepts and techniques are often partially transferable from one area of inquiry to another, especially when the data bases are so similar. Concepts from plant ecology such as ecosystem, competition, dominance, succession, climax, and trigger factor, along with many others, appear to have possible relevance to the human ecology of urban areas when the areas are interpreted as in this study. Much further research of course will be necessary to establish fruitful connections between the two disciplines.
APPENDIX I
## Categories of Occupations

### Category 1
This category was selected to represent the highest social stratum in Missoula. It was composed of individuals with the following occupations:

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<tr>
<th>Occupation</th>
<th>Socioeconomic Index Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician/surgeon</td>
<td>92</td>
</tr>
<tr>
<td>Lawyer or judge</td>
<td>93</td>
</tr>
<tr>
<td>Architect</td>
<td>90</td>
</tr>
<tr>
<td>Dentist</td>
<td>96</td>
</tr>
<tr>
<td>Osteopath</td>
<td>96</td>
</tr>
<tr>
<td>Chemical engineer</td>
<td>90</td>
</tr>
<tr>
<td>University professor (no instructors)</td>
<td>84</td>
</tr>
<tr>
<td>Federal public administrator</td>
<td>84</td>
</tr>
<tr>
<td>Manager (non-owner) of a large manufacturing establishment</td>
<td>79</td>
</tr>
<tr>
<td>Manager (non-owner) of a utility or a telecommunications facility</td>
<td>76</td>
</tr>
<tr>
<td>Banking official</td>
<td>85</td>
</tr>
</tbody>
</table>

A few obviously prestigious individuals not included above were added to this category. These included the mayor of the city,
congressmen, lieutenant governors, and owners and officials of large local mercantile establishments and lumber mills. If there was any doubt concerning an individual's status, he was not included in Category 1. In most cases, the choice was clear; the two exceptions being federal public administrators and managers of large manufacturing establishments. Here, it sometimes became a matter of judgement as to which manufacturing firms were "large" and which federal employees administrated to the required degree. These two sub-categories formed a very small percentage of the total for Category 1. The rather large number of representatives of Category 1, perhaps more than might be expected for a city of Missoula's size, is accounted for by the infusion, especially in 1948 and 1965, of increasing numbers of University professors. Although an exact record of the number of University people included in Category 1 was not kept, during the last two inquiry years they certainly were the largest single contributor to Category 1 and in both years were responsible for in the neighborhood of one-half of the total plotted.

Category 2. The proprietary or upper-middle class; this category was the most difficult of the four to extract from the directories in a uniform way.

The main problem confronted here was the extreme variability in prestige among proprietors of the same kind of establishment. The category supposedly defines upper-middle class types, and on the Duncan scale many businesses—for example, the construction
contracting business—register high enough to be included in it; but everyday experience tells us that many contractors—essentially one truck, one man operations—do not actually belong in this category. The problem is probably not completely soluble, for every business and every profession will have its successes and its failures; but, after considerable experimentation, some general rules were made in an effort to guide the selection process and to minimize insertions of non-representative individuals:

1. The lower limit of the SEE range of the proprietors comprising Category 2 was set at 43, thereby eliminating proprietors of eating establishments, grocery stores, barbershops, beauty parlors, service stations, auto repair shops, and a few others thought to be often questionable representatives of an upper-middle class.

2. With certain exceptions, representatives of Category 2 were limited to those proprietors who dealt in products rather than services. He could produce a product (including food products), sell a product, or rent a product; but he was not included if he primarily repaired a product.

Exceptions to the "product rule": proprietors of transportation businesses, laundry and dry cleaning proprietors (must be both), plumbing contractors, electrical contractors, proprietors of abstract companies, and stockbrokers.

3. Many directory entries for businesses list several associated officials. As a rule the top-ranking two for any Category 2 business were included.
Exceptions:

a) Especially large organizations (but not large enough to be included in Category 1).

b) Partnerships of three with no distinctions in rank within the organization.

In these two cases, three officials were included.

4. In questionable cases, the type and size of the directory entry was taken into account.

Following is a list of businesses, the proprietors, managers, and officials of which largely comprised Category 2 of this paper:

<table>
<thead>
<tr>
<th>Business</th>
<th>Self-employed</th>
<th>Salaried</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>61</td>
<td>***</td>
</tr>
<tr>
<td>Transportation</td>
<td>43</td>
<td>***</td>
</tr>
<tr>
<td>Wholesale</td>
<td>59</td>
<td>70</td>
</tr>
<tr>
<td>General merchandise</td>
<td>47</td>
<td>68</td>
</tr>
<tr>
<td>Apparel and accessories</td>
<td>65</td>
<td>69</td>
</tr>
<tr>
<td>Furniture, home furnishings, and equipment</td>
<td>59</td>
<td>68</td>
</tr>
<tr>
<td>Hardware, farm implements, and building materials, retail</td>
<td>61</td>
<td>64</td>
</tr>
<tr>
<td>Drug store</td>
<td>49*</td>
<td>62*</td>
</tr>
<tr>
<td>Jewelry store</td>
<td>49*</td>
<td>62*</td>
</tr>
<tr>
<td>Second hand store</td>
<td>49*</td>
<td>62*</td>
</tr>
<tr>
<td>Motor vehicles and accessories</td>
<td>70</td>
<td>65</td>
</tr>
<tr>
<td>Business</td>
<td>SEI numbers</td>
<td></td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Self-employed</td>
<td>Salaried</td>
</tr>
<tr>
<td>Plumbing and heating supplies</td>
<td>49*</td>
<td>62*</td>
</tr>
<tr>
<td>and contracting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical supplies and contracting</td>
<td>49*</td>
<td>62*</td>
</tr>
<tr>
<td>Abstract company</td>
<td>49*</td>
<td>62*</td>
</tr>
<tr>
<td>Stockbroker</td>
<td>49*</td>
<td>62*</td>
</tr>
<tr>
<td>Laundry and drycleaning</td>
<td>49*</td>
<td>62*</td>
</tr>
<tr>
<td>Livestock dealer</td>
<td>49*</td>
<td>62*</td>
</tr>
<tr>
<td>Hides and furs dealer</td>
<td>49*</td>
<td>62*</td>
</tr>
<tr>
<td>Photographer</td>
<td>50**</td>
<td>50**</td>
</tr>
<tr>
<td>Funeral director</td>
<td>59**</td>
<td>59**</td>
</tr>
<tr>
<td>Fuel dealer</td>
<td>49*</td>
<td>62*</td>
</tr>
</tbody>
</table>

* proprietor, "not elsewhere classified."
** included on Duncan list under "professional" standing.
*** score too high for inclusion in Category 2.

**Category 3.** This category represents the lower-middle class and is comprised of twelve occupations, all of which received a value of 19 on the Duncan scale. Of the twelve, two, carpenter and auto mechanic, appeared most often: perhaps ninety per cent of the total number of dots plotted as Category 3 represented these two occupations.

- Bottler
- Brewery worker or brewer
- Carpenter
- Carpetlayer
  - Domestic (not residing at place of work)
Laborers who worked for another person and resided with that person were excluded from the compilations.

<table>
<thead>
<tr>
<th>Type of laborer</th>
<th>SEI value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laborer, type unspecified</td>
<td>6</td>
</tr>
<tr>
<td>Laborer, sawmill, planing mill, mill work</td>
<td>3</td>
</tr>
<tr>
<td>Laborer, miscellaneous wood products</td>
<td>2</td>
</tr>
<tr>
<td>Lumbermen, wood choppers</td>
<td>4</td>
</tr>
<tr>
<td>Laborer, pulp, paper, and paperboard mills</td>
<td>6</td>
</tr>
<tr>
<td>Laborer, construction</td>
<td>7</td>
</tr>
<tr>
<td>Laborer, railroad</td>
<td>3</td>
</tr>
<tr>
<td>Laborer, transportation, except railroad</td>
<td>9</td>
</tr>
<tr>
<td>Laborer, telecommunications, utilities, and sanitary services</td>
<td>6</td>
</tr>
</tbody>
</table>
The term "laborer" seems to be losing popularity. In former years, a much larger percentage of the population were listed in the city directories as "laborer." In more recent years, the term is often replaced by such terms as "mill worker," "construction worker," "employee," or simply "with . . .". Only those directory entries with occupations listed as "laborer" were included in Category 4.
APPENDIX II
APPENDIX III
Your Personal

Street map of Missoula, Montana
BIBLIOGRAPHY


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Missoula County. Office of the Clerk and Recorder. Deed Book A.


