THE SOCIAL ECOLOGY OF CALI, COLOMBIA

By

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A DISSERTATION PRESENTED TO THE GRADUATE COUNCIL OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

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By
ERIC ARMIN WAGNER
DEDICATED TO
MY PARENTS
FLORENCE AND ARMIN WAGNER
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THE SOCIAL ECOLOGY OF CALI, COLOMBIA

By

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Major Department: Sociology

Urban social differentiation in Cali, Colombia, is examined by use of elements of both "classical" ecology and social area analysis. The barrios of the city are analyzed in terms of population density, land use, socioeconomic status, and family status, with maps showing the spatial distribution of these variables. Housing is used as an indicator of socioeconomic status, and mean number of family members and number of family units per dwelling unit are used as indicators of family status. These data were derived from compilations of the Cali Municipal Planning Office, the 1964 Colombian census, and a field survey of the barrios of Cali during the 1967-1968 academic year.

A substantial degree of functional specialization in land use was found, as evidenced by a clear and distinct central commercial area and a rather sharply-defined industrial area. At the same time, there were still a number of traditional commercial functions scattered throughout the city, leading to the conclusion that while the
commercial function was still in the process of changing from a preindustrial to an industrial level of organization, Cali was more an industrial than a preindustrial city.

While the density of the population of Cali declined from the center of the city to the periphery, level of socioeconomic status appeared to have a greater influence on density than distance from city center. As a result, some of the poorer peripheral areas of the city had higher densities than more central areas. In this respect Cali was more like non-Western than Western cities. At the same time, central city densities in Cali are now declining, which is more characteristic of Western than of non-Western cities. Like the examination of land use, the examination of density afforded a glimpse of a city in the process of change in its ecological structure.

The analysis of the spatial distribution of socioeconomic status and family status showed that socioeconomic status varied sectorially and family status varied concentrically. This confirms the findings of previous studies in social area analysis, and adds a Latin American example to the widening body of research exploring the dimensions of urban social differentiation.

The clear sectorization of socioeconomic status and the concentric distribution of family status in Cali, indicative of a rather pronounced level of urban differentiation, is more characteristic of industrial than it is of pre-industrial cities. Thus, while land use and density data
showed that Cali does not totally conform to the characteristics of industrial and Western cities, it is clear that Cali is much closer to these theoretical types than it is to non-Western and preindustrial cities. If this were not the case, then the differentiation of socioeconomic status and family status areas would have been much less clearly defined.

In theoretical terms, the shape of the city described in this study conforms much more closely to the sector hypothesis of Homer Hoyt than it does to the concentric zone theory of Ernest Burgess or the multiple nuclei theory of Chauncey Harris and Edward Ullman.

Further research is needed before the findings of this study can be applied to other cities in Latin America and the developing world.
Chapter I

INTRODUCTION

The internal structure of the city in Latin America is poorly understood. Though a number of investigations of this topic have been published, most indicate merely that the traditional, plaza-centered structure of the city in Latin America is changing in the direction of the North American city pattern, where status rises as one goes from the center toward the periphery of the city. The gross generality of this finding seems much too inadequate for the actual complexity of city structure that one finds in Latin America. Further, this finding seems to be rather culture-bound, implying that the "ideal" North American pattern of city structure will be attained as Latin American societies "modernize."

Through a fortuitous set of circumstances, the author was afforded the opportunity to examine the structure of a city in Latin America. Appointment as a graduate assistant in the University of Florida--Universidad del Valle Joint Project in History, Political Science, and Sociology, supported by a grant from the Rockefeller Foundation, enabled him to spend the 1967-1968 academic year in
Cali, Colombia. This position provided an opportunity to gather data for an ecological study.

Cali is a rapidly growing, rapidly industrializing city of more than six hundred thousand people in southern Colombia. Though not the capital of the country, it is a regional city of great importance, and is in the center of one of the richest agricultural areas in the world, the Cauca River Valley. Much of its growth has been very recent, though the city was one of the earliest to be founded in South America, in 1536. Thus its long colonial tradition, and recent growing industrialization, make it an excellent example of a fairly large Latin American city. Further, Cali is the third largest city in the second most populous Spanish-speaking nation of the South American continent. A study of the ecology of a major city such as Cali can make a basic contribution to our understanding of urbanization in Latin America.

This study focuses upon residential aspects of the internal structure of Cali. For all the residential barrios of the city, socioeconomic status is examined by means of a study of housing. A map of these barrios shows their spatial distribution. The number of family members and family units per housing unit, indicators of family status, are also mapped for the residential barrios. These spatial distributions are then examined to determine the structural pattern of the city. Do the higher status people live near the
center of the city, are they moving toward the periphery, or is another, possibly more complex, explanation needed?

Supporting this focus on residential ecology are data pertaining to urban land use, recent growth and density of the barrios, and an examination of the effect of major arterial streets on the location of upper-status residential areas.

The results of this study certainly will not be the basis for generalization about all the cities of Latin America. Latin America, like other large areas of the world, is an area of great diversity. Hopefully, the results will lend themselves to comparison and conjunction with other studies, and eventually help in the formulation of a more general theory of residential differentiation for Latin America. As of now, data are not adequate nor varied enough to support such a general theory. The next stage in the development of such a theory should be the undertaking of several studies of the factorial ecology of Latin American cities, to determine their basic social dimensions. Hopefully, these studies will take place in several cities already studied by more traditional methods, so that eventual comparisons among various types of studies may be facilitated, adding meaningfulness to the more traditional interpretations.
Chapter II

REVIEW OF THE LITERATURE ON ECOLOGY

The literature dealing with urban ecology is enormous and varied. It would not be feasible even to list, let alone to discuss, all of the sociological research in a work of the present scope. Therefore, the approach will be to trace the general development of the three aspects of urban ecology which are of primary concern to this study: (1) the "classical" school of urban ecology, focusing on the concept of the "natural area"; (2) the more recent (post-World War II) emphasis on social area analysis; (3) the findings of those few studies which discuss the ecology of the Latin American city. While disciplines other than sociology, such as geography and anthropology, are becoming involved in urban ecology, sociology moved first in this area, and this study will draw primarily upon sociological interpretations of urban ecology.

The "Classical" School of Urban Ecology

There is no one totally accepted "beginning" for the "classical" school of urban ecology, though Americans generally consider the writings of Robert Park to have been the
foundation for this area of inquiry. But Park had his precursors, and brief mention must be made of them.

Among the earliest ecological studies were the nineteenth-century studies of M. de Guerry de Champneuf in France (Elmer, 1933: 63-70) and Henry Mayhew and Joseph Fletcher in England (Levin and Lindesmith, 1961: 14-21). M. de Champneuf studied the spatial distribution of crime, relating the levels of crime to French departments (Elmer, 1933: 63-70). One of Mayhew's works, The Criminal Prisons of London, included a shaded ecological map of London, showing the density of the London population (Levin and Lindesmith, 1961: 17). Fletcher's book, Summary of Moral Statistics of England and Wales, was "centered around a series of 12 ecological maps in the appendix of the volume and an ecological map in the frontispiece colored to represent what we might call 'natural areas' in England and Wales" (Levin and Lindesmith, 1961: 19). Unfortunately for the historical reputations of their authors, these empirical studies were soon overshadowed by the social philosophizing of Comte and Spencer, and were essentially forgotten by later students of urban ecology.

Perhaps the most important of the precursors of Robert Park was Charles Booth, whose monumental seventeen-volume Life and Labour of the People in London had great influence in late eighteenth-century England. This work classified the people of London according to "social
condition," on the basis of class, space, and time, and with divisions of "poverty," "industry," and "religious influences" (Pfautz, 1967: 47-50). In the process of this analysis Booth discussed several of the ideas which were later to receive much attention by the Chicago school of urban ecology, such as the centralization of urban functions (Pfautz, 1967: 99-102), residential segregation and succession (Pfautz, 1967: 90-96), concentric rings with different types of population (Pfautz, 1967: 54-55, 78-79), and the "separation between place of residence and place of work" (Pfautz, 1967: 106-107). Indeed Booth was a precursor of modern urban ecology, as Pfautz notes: "... contained in his classic survey are both theoretical and methodological contributions that make it one of the principal antecedents of the research methods and interests informing the rise of an empirical sociology of the city in America in the twenties ..." (Pfautz, 1967: 6).

Robert E. Park was certainly aware of Booth's work, but did not seem to credit it with much of a contribution beyond the descriptive level. "It was not, however, Booth's statistics, but his realistic descriptions of the actual life of the occupational classes ... which made these studies a memorable and permanent contribution to our knowledge of human nature and society" (Park, 1929: 46).

Robert Park was more a social theorist and less an empiricist than Charles Booth. In fact, Park's writings were relatively devoid of substantive research findings.
Park's students and colleagues at the University of Chicago (such as Ernest Burgess, Louis Wirth, Harvey Zorbaugh, and Nels Anderson) provided the substantive support for his theorizing with a number of specific studies (Burgess, 1925; Wirth, 1938; Zorbaugh, 1929; Anderson, 1923). But it was Park's writing more than that of anyone else which was instrumental in the establishment of the "Chicago school" of urban sociology.

In his now-classic essay, "The City: Suggestions for the Investigation of Human Behavior in the Urban Environment," Park specified what he meant by human ecology:

There are forces at work within the limits of the urban community--within the limits of any natural area of human habitation, in fact--which tend to bring about an orderly and typical grouping of its population and institutions. The science which seeks to isolate these factors and to describe the typical constellations of persons and institutions which the co-operation of these forces produce, is what we call human, as distinguished from plant and animal, ecology (Park, 1925: 1-2).

To isolate these factors at work within the natural areas of the city, Park suggested that social scientists "study the growth of cities, to compare the idiosyncrasies in the distributions of city populations" (Park, 1925: 6), discover "the forces which tend to break up the tensions, interests, and sentiments which give neighborhoods their individual character" (Park, 1925: 8), and study the vocational types that the division of labor of the city has produced (Park, 1925: 14). In addition to these factors, Park suggested that urban ecologists study what he termed "the moral region":

It is inevitable that individuals who seek the same forms of excitement, whether that excitement be furnished by a horse race or by grand opera, should find themselves from time to time in the same places. The result of this is that in the organization which city life spontaneously assumes the population tends to segregate itself, not merely in accordance with its interests, but in accordance with its tastes or its temperaments. The resulting distribution of the population is likely to be quite different from that brought about by occupational interests or economic conditions (Park, 1925: 43).

Roderick D. McKenzie, one of Park's earliest students at the University of Chicago, expanded and refined many of Park's ideas, and more clearly defined human ecology as a study of the spatial and temporal relations of human beings as affected by the selective, distributive, and accommodative forces of the environment. Human ecology is fundamentally interested in the effect of position, in both time and space, upon human institutions and human behavior (McKenzie, 1968a: 4).

McKenzie also made a notable contribution of his own, by introducing the concepts of ecological processes to show the dynamic (or, as he termed it, "fluid") nature of urban structure.

By ecological process is meant the tendency in time toward special forms of spatial and sustenance groupings of the units comprising an ecological distribution. There are five major ecological processes: concentration, centralization, segregation, invasion, succession (McKenzie, 1968b: 23-24).

These dynamic processes of urban ecology were linked to specific areas of the city, as exemplified by the process of invasion.

The general effect of the continuous processes of invasions and accommodations is to give to the developed community well-defined areas, each having its own peculiar selective and cultural characteristics. Such units of communal life may be termed "natural areas," or formations, to use the term of the plant ecologist (McKenzie, 1968a: 17).
Numerous as the ideas of Park and McKenzie were, it remained for one of their colleagues to make the most memorable contribution to the literature on urban ecology. This is the well-known concentric zone theory of Ernest W. Burgess. He hypothesized that "the expansion of the city can best be illustrated, perhaps, by a series of concentric circles, which may be numbered to designate both the successive zones of urban extension and the types of areas differentiated in the process of expansion" (Burgess, 1925: 50). At the center was the central business district, surrounded by a zone in transition from residence to business and light manufacturing. Beyond this was a zone of working-men's homes, a residential zone, and finally a commuters' zone (Burgess, 1925: 50-51). Burgess admitted this was an ideal scheme which might not fit any city exactly (1925: 51-52), but believed it would be of great help in studying the social organization of the city.

Indeed it was. Many studies, a few of which are indicated below, made use of Burgess' theory. Shaw and McKay (1931) studied juvenile delinquency in a number of American cities, and found that juvenile delinquency declined in each successive zone. White (1932) related crime and a number of social factors, and found that these factors and crime correlated closely with the zones. Ford (1950) studied population succession in Chicago, and discovered that each new immigrant group in Chicago pushed older immigrant groups farther from the center of the city. Kish
(1954) found that differentiation in metropolitan areas decreases with distance from the center of the city, though it does not decrease in a straight line.

Along with Park, McKenzie, and Burgess, Louis Wirth had great influence in the Chicago school of urban sociology, though he did not deal as directly with urban ecology as did these other men. However, in "A Bibliography of the Urban Community," which Wirth wrote for Park, Burgess, and McKenzie's The City, he devoted a section to the ecological organization of the city (Wirth, 1925: 187-195). In this section he defined the ecological organization of the city as "the spatial distribution of population and institutions and the temporal sequence of structure and function following from the operation of selective, distributive, and competitive forces tending to produce typical results wherever they are at work" (Wirth, 1925: 187). This appears to the writer to be one of the most comprehensive definitions of urban ecology to be offered by a member of the Chicago school. Louis Wirth also reiterated the usefulness of the concept of the natural area, and defined it.

Plant ecologists have been accustomed to use the expression "natural area" to refer to well-defined spatial units having their own peculiar characteristics. In human ecology the term "natural area" is just as applicable to groupings according to selective and cultural characteristics (Wirth, 1925: 188).

Perhaps Louis Wirth's best-known contribution came in his classic study of "Urbanism As a Way of Life" (1938). In this article he delineated three highly useful variables.
"On the basis of the three variables, number, density of settlement, and degree of heterogeneity, of the urban population, it appears possible to explain the characteristics of urban life and to account for the differences between cities of various sizes and types" (Wirth, 1938: 18).

Although the "classical" school of urban ecology was dominated by the Chicago urban sociologists, and especially by Burgess' concentric zone theory, two other theories which this writer would call "classical" are important. These are Homer Hoyt's sector theory and Chauncey D. Harris and Edward L. Ullman's multiple nuclei theory.

Hoyt's sector theory, or "sector hypothesis," as it is often called, was presumably derived from the work of Richard M. Hurd (1924). In his study, Hurd suggested that urban growth involved two principles which operate at the same time: central growth and axial growth. As the city grew, it would spread outward from the center in all directions, or along transportation routes, such as water courses, railroads, and turnpikes, forming a star shape (Hurd, 1924).

Homer Hoyt elaborated on these principles of Hurd by studying rental data from a large number of American cities, with special emphasis on high-rent areas. By tracing the movement of high-rent areas, he was able to show how they moved outwards along radial lines in distinct sectors of the city. Hoyt felt that "the movement of the high-rent area is in a certain sense the most important since it tends to pull the growth of the entire city in the same direction" (Hoyt,
1939: 114), and deduced a number of hypotheses concerning these high-rent areas:

1. High-grade residential growth tends to proceed from the given point of origin either along established lines of travel or toward another existing nucleus of building or trade areas.
2. The zone of high rent tends toward high ground which is free from risk of floods and to spread along lake, bay, river, and ocean ports, where such waterfronts are not used by industry.
3. High-rent residential districts tend to grow toward the section of the city that has free open country beyond the edges and away from "dead end" sections which are prevented from expanding by natural or artificial barriers.
4. The higher-priced residential neighborhood tends to grow toward the homes of the community leaders.
5. Sometimes movement trends of office buildings, banks, and stores pull the higher-priced residential neighborhoods in the same general direction.
6. High-grade residential areas tend to develop along the fastest existing transportation lines.
7. Deluxe apartment areas tend to be established near the business centers in old established residential areas.
8. The growth of high-rent neighborhoods continues in the same direction for a long period of time.
9. High-rent neighborhoods do not skip about at random in the process of movement--they follow a definite path in one or more sectors of the city.
10. It is possible, under some conditions, for high-rent areas to "double back," or return toward the center of the city.
11. High-rent areas tend to be adjoined by medium-rent areas, and sharp disjunctions in rental areas are not frequent (Hoyt, as quoted in Thomlinson, 1969: 146-147).

Harris and Ullman's multiple nuclei theory is the third and last "classical" theory of urban ecology that will be presented here. Harris and Ullman argued that the multiple functions of the city, such as commerce, industry, and residence, would tend to develop separate centers, or nuclei. Four factors were hypothesized to lead to the emergence of nuclei: like activities tend to group together; some unlike
Activities are incompatible; some activities require specialized facilities; and some activities cannot afford the high rents of the most desirable sites (Harris and Ullman, 1945: 7-17).

Studies of "classical" urban ecology seem to have centered around four factors, as described by Park.

It is the interaction of . . . four factors--(1) population, (2) artifacts (technicological [sic] culture), (3) custom and beliefs (non-material culture), and (4) the natural resources that maintain at once the biotic balance and the social equilibrium, when and where they exist (Park, 1936: 15).

To simplify these propositions of Park, it seems to this writer that the essential nature of urban ecology revolves around two basic axes. One of these axes, areal analysis, has been the focus of attention of "classical" ecologists. The other axis, social organization, is the focus of social area analysts and factorial ecologists, and will be dealt with more extensively in the next section of this chapter. The ecologist seeks to understand the dynamic relationship between these basic axes and population categories. He wants to explain how organization (sometimes referred to as the division of labor) and areal environment are related.

Areal analysis, usually referred to by the term "natural area," occupies a central position in urban ecology and in this study. This emphasis grew out of the biological foundations of urban ecology, in which breakdowns by area were seen as evidence of environmental adaptation. This adaptation was usually discussed in terms of competition and
the dynamic ecological processes introduced by McKenzie, and previously elaborated upon in this study.

A major criticism directed at the "classical" school of urban ecology has been that it placed too great an emphasis on biological analogies and the economic determinism of land values (Firey, 1947; Alihan, 1938; Firey, 1961). The subsocial biotic competitive nature of man became a major focal point of this criticism. By starting with the competitive biotic community of man ecologists are forced to minimize or limit their attentions to society. As Hollingshead puts it,

This type of reasoning assumed that man in society is basically, ever and always, man the primordial animal. Society and its concomitant culture are only excrescences, not integral parts of the animal man (1947: 196).

This process of impersonal competition provides the main framework of ecological structure with the interdependence of individuals and groups termed "symbiotic" rather than societal. However, as Alihan shows us, the two ecological terms of community and society are so confused by ecologists themselves that arbitrary distinction becomes meaningless (Alihan, 1938: 18-49).

Another criticism of the "classical" school of urban ecology has been stimulated by Firey's advocacy of greater importance for social values such as sentiment and symbolism (Firey, 1961).

It seems to this writer that "classical" ecologists such as Park and Burgess were not just tied to a biological
determinism as exemplified by their emphasis on the idea of competition, but did deal with cultural factors as well. At the same time it is true that the role of cultural factors received much less emphasis than perhaps should have been the case. Clearly values do play an important part in ecological differentiation, as numerous studies indicate (Jonassen, 1961; Myers, 1961). But the relationship between values and urban structure has not been clarified; values may relate to a different aspect of the urban ecological system than do such things as competition. However, there seems no reason to believe that either of these approaches ("biological" competition or cultural values) ought to be eliminated from the sphere of urban research. Certainly we have few enough tools with which to work in the social sciences, and there can be no doubt that the "classical" school of urban ecology opened the door to a great deal of knowledge about our urban areas. Much of what we know about our cities today is based on ecological studies.¹

The use of the concept of the "natural area" has been subject to criticism. Hatt reports that many areas turn out to be "fictitiously homogeneous and intensify the gradient and natural area pattern; and this to the point of

¹It is by no means certain that the "biological" aspect of man's social nature should be treated secondarily, or brushed aside. The field of human ethology within sociology seems to be enjoying a resurgence of academic interest, reflecting, perhaps, the remarkable rise in the popularity of an ethological approach in the biological sciences.
almost creating a reality where none exists" (Hatt, 1961: 106). As a result he argues for a distinction "between natural areas as logical, statistical constructs integrated with a plan for research (or administration) and the concept of natural areas as a series of spatial and social factors which act as coercive influences upon all who inhabit the geographically and culturally defined area" (Hatt, 1961: 107). Awareness of this distinction should help avoid the reification of the concept of the natural area. Timms, however, argues that concern with lack of areal homogeneity is not the point.

The existence of differences within a census tract or any other small area is only prejudicial to the use of the area in ecological analysis if the differences relate to the proportions of the population possessing specified traits in major divisions of the area. The criticisms of such writers as Hatt, Myers and Mabry, constituted on the finding that census tracts contained heterogeneous populations rather than homogeneous ones, are believed to be misdirected (Timms, 1971: 42).

Timms presents one of the most persuasive arguments for the use of natural areas that this writer has seen. By reviewing a great deal of research on the city that has been done in the last three or four decades, he shows that the local area is a factor of great explanatory usefulness; more specifically, the local area is the framework within which a great deal of behavior occurs. Timms shows that "three major sources of material are available for an analysis of the relationship between residence and behavior: studies of the association between propinquity and friendship, studies concerned with explicating the socio-cultural factors
involved in deviant behavior, and studies concerned with the relationship between area of residence and educational experience" (Timms, 1971: 9). Some of the research reviewed shows that "the frequency of marriage decreases as the distance between the two parties increases" (Timms, 1971: 13), the closer people are to each other, the more friendship contacts they have (Timms, 1971: 10-12), "where an adolescent lives will have a major effect on the chances of his becoming delinquent" (Timms, 1971: 17), and that most early personality development takes place in local areas (Timms, 1971: 31-34). Robson also talks about the . . . importance of the effects of the milieu on urban social structure. . . . No matter what the area, the attitudes of individual families were more similar to those prevailing around them than to those of their "objective" social class. The area of residence is therefore either a clue to or a determinant of these attitudes (Robson, 1969: 244).

Timms sums up his review very neatly:

The consequences for human behaviour of residence in one neighborhood rather than another are mediated by the network of social relationships which connect the individual with his family, with peer-groups, with voluntary associations, and with a plethora of other groups. The neighbourhood is important because so many of these relationships depend on face-to-face contact and this form of interaction is particularly sensitive to spatial distance (Timms, 1971: 34).

It is the contention of this study that areal analysis, through the use of the natural area, has an important organizing and analytical function. It will play an essential role in the present research.
Social Area Analysis

Criticisms of the "classical" school of urban ecology, some of which were reviewed in the previous section of this chapter, dominated urban sociology in the United States during the pre-World War II and World War II period. There were few new developments in the study of urban structure during this time. It was an era of consolidation, refining what was known and filling in gaps in empirical research.

A major breakthrough in the study of urban structure came in 1949, when Eshref Shevky and Marilyn Williams published *The Social Areas of Los Angeles: Analysis and Typology* (1949). Although not without criticism, this study and a later one by Eshref Shevky and Wendell Bell, *Social Area Analysis: Theory, Illustrative Application and Computational Procedures* (1955), which elaborated upon the theory and methodology involved in social area analysis, stimulated a great deal of research on the social structure of the city. The dimensions and breadth of this breakthrough are still not known in the early 1970s. New studies in social area analysis (now often referred to as "factorial ecologies") are being published regularly.

The major difference between "classical" ecologists and social area analysts is that the former looked at the way social organization was spatially evidenced in the city while the latter examined the way that areal units were
situated in social space. As Shevky and Bell describe social area analysis,

The urban typology of The Social Areas of Los Angeles (1949) is a classificatory schema designed to categorize census tract populations in terms of three basic factors--social rank, urbanization, and segregation. Each census tract population was given three scores, one for each of the indexes of the factors; and then the tract populations with similar configurations of scores on the three indexes were grouped together into larger units called social areas (Shevky and Bell, 1961: 227).

Briefly, Shevky and Bell started by describing basic aspects of modern society and the organizational trends that are associated with these aspects. They then connected organizational trends to structural changes in modern society, which they "redefined as structural reflections of change to serve as descriptive and analytic concepts for the study of modern social structure" (Shevky and Bell, 1961: 227).

These structural reflections of change, used as factors, are social rank (sometimes termed socioeconomic status), urbanization (sometimes termed family status), and segregation (sometimes termed ethnic status). Census statistics were then used to construct indexes for each of these factors (Shevky and Bell, 1961: 227-229).

The authors claimed a number of uses for social area analysis. Though early applications of the procedure dealt with the census tract as the unit of analysis, it was felt that whole cities could become the unit of analysis, enhancing our knowledge of regional and even national similarities and differences among cities. Being able to define specific subareas of the city should aid the urban
planner and the social scientist. By use of the typology, sociologists and others should be able to undertake comparative studies of cities at one point in time, or test the conditions of change at several points in time (Shevky and Bell, 1961: 232-234). Finally, "in addition to its use as a frame for the manipulation of available statistics such as crime rates, suicide rates, and others, the typology can be used as a frame for the design and execution of field studies" (Shevky and Bell, 1961: 234).

This latter contention was elaborated upon by Bell (1961) in a subsequent study. In examining social participation by type of neighborhood in San Francisco, he found that by specifying social areas or neighborhoods, he could generally account for differences in social isolation. Thus "the Shevky method of analysis of census tract data provides a frame within which detailed investigations of the social relations in sub-communities within that city can be designed and executed" (Bell, 1961: 251). Specifically, Bell stated that "the typology can be used as a device for the selection of neighborhoods for intensive study, . . . provides an integrative frame for urban sub-area field studies through conceptual articulation and integration with a large mass of ordered data . . . [and] is adapted to the analysis of the combined or independent effect of personal and unit characteristics on dependent variables" (Bell, 1961: 251-252).
Social area analysis has been strongly criticized by Amos Hawley and Otis Dudley Duncan (1957). Their criticism centers around what they feel is the lack of an adequate theoretical base for characterizing social differentiation. They argue that Shevky and Bell do not answer the question of why residential areas within cities should differ from one another, and argue that the Shevky and Bell "efforts at 'construct formation' . . . look suspiciously like an ex post facto rationalization for their choice of indexes . . ." (Hawley and Duncan, 1957: 339). In addition, Duncan (1955) questions the empirical validity of the indexes of social rank, urbanization, and segregation. Interestingly, other scholars do not seem to have joined in Hawley and Duncan's criticism, or to have advanced criticism of their own. Researchers from other disciplines seem to have been even more favorably inclined toward social area analysis than sociologists (Tiebout, 1958; Timms, 1965).

Many researchers used social area analysis as described by Shevky and Bell to study the city. Anderson and Egeland (1961) studied Indianapolis, Indiana, Syracuse, New York, and Akron and Dayton, Ohio, to determine the spatial aspects of social area analysis. They discovered that economic status is generally sectorially distributed while family status is distributed concentrically (Anderson and Egeland, 1961: 392-398). McElrath, in a study of Rome, found that economic status and family status were distributed both concentrically and sectorially, with large families of
low economic status occupying the outer edges of the metropolis (McElrath, 1962). Several studies examined the generality of the Shevky indexes, to see if they were valid and if they could be used with success in cities other than Los Angeles and San Francisco. Van Arsdol, Camilleri, and Schmid, in a study of ten large American cities, discovered that "at least three factors were necessary to account for census tract variation in each of the ten cities studied . . . the Shevky indexes appear to have high generality for the cities of this study" (Van Arsdol, Camilleri, and Schmid, 1961: 239). Anderson and Bean (1961) replicated the Van Arsdol, Camilleri, and Schmid factor analysis of the variables of the Shevky-Bell social areas in Toledo, Ohio, and showed that four rather than three major dimensions may be extracted. Specifically, while it was found that the social rank factor loaded highly on occupation and education, and the segregation factor loaded heavily on Negroes, double-occupancy, and crowding, the original urbanization-family status factor should be broken down into two factors. Urbanization (or housing characteristics) loads most heavily on owner-occupancy and multifamily dwelling units, and family characteristics loads most heavily on the fertility ratio, females in the labor force, and double occupancy (Anderson and Bean, 1961: 119-124).

The real importance of the Van Arsdol, Camilleri, and Schmid study and the Anderson and Bean study lies in their application of the techniques of factor analysis to
the seven variables used in social area analysis by Shevky and Bell and other census variables. As described by Harman

The principal concern of factor analysis is the resolution of a set of variables linearly in terms of (usually) a small number of categories or "factors." This resolution can be accomplished by the analysis of the correlations among the variables. A satisfactory solution will yield factors which convey all the essential information of the original set of variables. Thus, the chief aim is to obtain scientific parsimony or economy of description (Harman, quoted in Timms, 1971: 47-48).

These studies of factor analysis led to a number of additional researches, which became known as "factorial ecologies." Factorial ecology is "the application of factor analysis to data describing the residential differentiation of the population" (Timms, 1971: 54).

Probably the best review of the findings of factorial ecologies to date is Philip Rees' chapter in Berry's City Classification Handbook: Methods and Applications (Rees, 1972). Here some thirty-five factorial ecologies were summarized and compared, and the three factors used in social area analysis (social rank, urbanization, and segregation) were generally found to be basic, although several other factors, such as residential mobility, the degree of recent immigration, and urban growth, were found in a number of studies (Rees, 1972: 286-287). Timms, who also reviewed a number of factorial ecologies, emerged with essentially the same conclusion.

... in the various studies of factorial ecology the most striking feature ... is the general consistency of the findings. The manifold variation of sub-area
populations within the great majority of the cities so far analysed appears to be reflection of no more than three or four underlying dimensions of differentiation. A factor interpreted as socio-economic status or social rank appears to be effectively universal. A set of factors which index differences in the family types characteristic of the population is also generally apparent. Factors relating to the ethnic composition of the population and to its mobility characteristics occur rather less frequently, but still sufficiently often to warrant their inclusion as general differentiating dimensions. Although specific factors relating to the peculiar characteristics of the populations concerned may occur in any city, the basic pattern is organized around a small number of dimensions (Timms, 1971: 55).

Thus it seems clear that three or four basic factors differentiate among areas of the city—at least in Western industrialized cities.²

Unfortunately, little is known about the factorial ecology of cities in relatively unindustrialized countries. The only examples available are those of Calcutta (Berry and Rees, 1969) and Cairo (Abu-Lughod, 1969). There are no known published studies of the factorial ecology of a Latin American city, though there is apparently a Brazilian study in preparation (Rees, 1972: 283).

In the study of the factorial ecology of Calcutta, it was found that one of the factors, a land use and familism gradient, "is the direct equivalent of the Shevky-Bell urbanization (family status) dimension" (Berry and Rees, 1969: 489). Nine other factors were also discovered (two traditional commercial communities, substantial residential areas,

²With the exceptions of Cairo, Egypt, and Calcutta, India, the factorial ecologies examined by Rees and Timms were of Western industrial cities.
literacy, Muslim concentrations, and four special land-use configurations) (Berry and Rees, 1969: 470-481). These other factors led to the conclusion that "socioeconomic status and minority group membership are linked," making ethnicity more important than socioeconomic status "in defining the social dimensions within which choices are made" (Berry and Rees, 1969: 490).

The findings . . . reveal that alongside . . . rich ethnic variability . . . Calcutta is also characterized by a broadly concentric pattern of familism, an axial arrangement of areas according to degree of literacy, and both substantial and increasing geographic specialization of areas in business and residential land uses, gradually replacing the former mixture of businesses and residences that were separated, rather, into occupational quarters. This mixture of preindustrial and industrial ecologies thus lends support to the idea that the city is in some transitional developmental stage (Berry and Rees, 1969: 469).

Abu-Lughod found three main factors in her factorial ecology of Cairo--style of life, male dominance, and social disorganization (Abu-Lughod, 1969: 205-207). These were not the three basic factors of social rank, urbanization, and segregation postulated by Shevky and Bell. However, Abu-Lughod's style of life factor did include both social rank and urbanization variables. This factor, "while clearly representing socio-economic status, also includes many variables indicative of family life, suggesting that it is to be interpreted as a 'style of life' vector in which class and family patterns are inextricably linked" (Abu-Lughod, 1969: 205). This link between class and family characteristics she attributed to the "scale" of the society,
whereby "the pattern of social (and physical) differentiation in preindustrial societies (cities) would be relatively simple and perhaps virtually unidimensional; as the scale of society increased, there would be increased complexity of differentiation and a separation of the axes or dimensions of differentiation" (Abu-Lughod, 1969: 199).

Rees, after reviewing the studies of Cairo and Calcutta, concluded that "it was abundantly clear even from two studies that the factorial ecology of non-Western cities was very different from that of Western cities but capable nevertheless of being examined within the same framework" (Rees, 1972: 296). It should be stressed, however, that the studies of Cairo and Calcutta both accounted for a substantial proportion of urban social differentiation on the basis of family status and socioeconomic status. In Calcutta, family status was a specific factor, while socioeconomic status was tied to ethnicity. In Cairo, family status and socioeconomic status were combined in a style-of-life factor. Thus it seems that socioeconomic status and family status are major determinants of urban social structure in both Western and non-Western societies.

One other general conclusion can be drawn from a review of studies of social area analysis. It appears that

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3This theory of scale, in hazy form, Abu-Lughod attributes to Eshref Shevy and Wendell Bell, Social Area Analysis: Theory, Illustrative Application and Computational Procedures (1955).
socioeconomic status varies sectorially, family status varies concentrically, and ethnic status shows a tendency to cluster in particular parts of the city. Thus it may be said that the "classical" models of urban ecology (Burgess' concentric zone theory, Hoyt's sector theory, and Firey's "sentiment and symbolism" approach) were each capturing a basic dimension of urban social differentiation.4

The Ecology of the Latin American City

Neither a factorial ecology nor a social area analysis (sensu stricto)5 of a Latin American city has yet been published. What we know about the internal structure and social differentiation of the city in Latin America comes from a few descriptive studies based on the "classical" theories of urban ecology. However, Schnore points out that most of these descriptive studies were not originally undertaken to study the ecology of the city, but came about as a "byproduct" of other studies (Schnore, 1965). From the historical standpoint this paucity of research is surprising,

4This conclusion has been tentatively reached by Berry and Rees (1969: 459) and Anderson and Egeland (1961: 396-398).

5Rees defines social area analysis (sensu stricto) as "the type of analysis proposed by Shevky and outlined in Shevky and Bell (1955). Some seven census variables are used to construct three indices: social rank (economic status), urbanization (family status), and segregation (ethnic status). The terms in parentheses are Bell's, the preceding terms Shevky's" (Rees, 1972: 324).
since Latin America has such a long and rich urban tradition. From the methodological standpoint it is not so surprising, since data on subareas of the city in Latin America are exceedingly difficult to obtain.

Though neither the Aztec nor the Inca was an urban civilization, both had cities of some size. This city tradition, coupled with the Spanish proclivity to found cities, led to an emphasis on the city in colonial Spanish America. This emphasis was certainly not urbanization, but did lead to a city-directed and controlled society, and indeed a city-oriented society. As Gakenheimer points out, this orientation affected both Spaniards and Indians.

There is evidence that arriving Spaniards expected to be, and insisted upon being, city dwellers. . . . a person attracted to America by the promise of great opportunity was not apt to isolate himself, by becoming a country dweller. . . .

This attitude of the Spanish population was complemented by that of the Indians, for a special aspect of Inca culture was its amenability to urban living. . . . the complex social and economic organization which characterized the Inca Empire and the rigid social controls exerted on the population made adjustments to urban life fairly easy for the Indians (Gakenheimer, 1967: 35-36).

Jorge E. Hardoy provides a succinct outline of the stages involved in urbanization in Latin America. The first is "the precolonial urban culture of the Aztecs and Incas," which provided the basis for the second stage, "the determination by the Spanish of the territorial pattern of foundation, on the basis of the regional and urban infrastructure of the indigenous culture and the distribution of the Indian population" (Beyer, 1967: 57-58). The third stage
was virtually completed by 1580, when "the Spanish and Portuguese [had] established the essential settlement pattern of Latin America" (Beyer, 1967: 58). Next was "a period of consolidating colonial institutions and establishing the structure of colonial society," which lasted nearly two hundred years, until the fifth stage of great European immigration, which reached Latin America about 1880 (Beyer, 1967: 60-61). In the sixth and last stage, which we are living in, rural groups poured from the countryside into the city (Beyer, 1967: 62).

Though it is not the intention to discuss the urbanization process in Latin America here, it has been useful to point out Hardoy's parameters of urbanization, because it is these parameters that have had great effect on the ultimate structure of Latin American cities. Specifically, the early laying out and planning of colonial cities, the coming of the early Spaniards (and thus the landholders) to the city, the coming of the indigenous people to the city, and the building of the social structure and organization on the basis of the city all had lasting effects upon the internal structure and the residential differentiation of Latin American cities.

The earliest study of the internal structure of a Latin American city was Hansen's description of Mérida (1934). Writing in the 1930s, his most important finding was that Mérida, capital of the Yucatán, was beginning to change from its traditional pattern of highest status groups in the
center and lowest on the periphery of the city, to a North American pattern, where status increased as one went outward from the center toward the periphery. Yet the traditional pattern was still very dominant.

In general, status declines with distance from the center. As the periphery of the city is approached the ratio of thatched houses becomes higher, rents are lower, and individuals wearing the traditional costume of the lower class are seen more frequently (Hansen, 1941: 31).

This traditional pattern in Latin America is closely associated with the "plaza plan" of colonial Spanish towns. In these towns the social and geographic center of the city was an open square, which generally was surrounded by a cathedral, a city hall, and possibly another governmental building or two. Adjacent to these was the market and a few commercial enterprises, and the homes of the more important personages. As one went further outward from the plaza, social status declined. This structural organization was composed of blocks which were usually laid out in a grid fashion.

The next studies were those undertaken by Hayner in Mexico City and Oaxaca. He chose these two cities to illustrate contrasts between the "old" colonial Mexico and the "new" modern Mexico. In Oaxaca he found that the "old" patterns still persisted.

In the cities of Mexico . . . the better homes were in the past characteristically located near the central plaza, and the least desirable areas were on the periphery. Oaxaca still exhibits this plaza-centered structure (Hayner, 1944: 91).
In Mexico City Hayner found that the original plaza-centered structure (which he felt was similar to Hansen's description of Mérida) was breaking down, with many of the better homes moving toward the periphery. This movement he attributed to increasing industrialization and commercialization; he felt it was leading in the direction of the typical North American city structure, where the traditional pattern of status declining from the center of the city was reversed. "One wonders whether under the influence of increasing population and modern means of communication and transportation, all other large Latin-American cities are assuming an ecological pattern similar to that of cities in the United States" (Hayner, 1945: 295-304). In a related study supporting the findings for Mexico City, Hayner found that crime generally decreased as one went outward from the center of the city. At the same time, the four worst slums, all of which were new, were on the periphery (Hayner, 1946: 428-438). Thus while the upper class has left the center of Mexico City for the periphery, many elements of the traditional ecological structure persist in the face of modernization.

Though ecological studies generally deal with fairly large cities, there is evidence both pro and con that the traditional pattern may be found in smaller communities as well. In San Luis Jilotepeque (Guatemala) Gillin found that the ladinos, and thus the better residences, clustered
around the plaza (Gillin, 1945: 1-14). In Pichátaro (an Indian village in Mexico) Stanislawski found the opposite.

The anatomy of the town indicates its difference from Hispanic settlements. There is far less concentration of activities. . . . There is little difference in quality between a house on or near the plaza and a house at the outskirts. In fact, the two chief officials of town at the time that this inquiry was made lived at one extreme corner of the village. They both agreed that one place was as good as another for one's home (Stanislawski, 1961: 350-351).

This provides some evidence for the supposition that a differentiated ecological structure does not exist unless there is a heterogeneous population (as is generally true in a city). In San Luis Jilotepeque there was class heterogeneity; in Pichátaro there was homogeneity.

The Hawthorns, who lived in Sucre, Bolivia, in 1941-1942, investigated the internal structure of that city in connection with a study of social stratification. They found that high-status residences were clustered near the center of the city, and low-status residences were on the periphery.

Sucre's social classification of itself recognizes very clearly this distribution of residences and holds them to be symbols of social ranking. Whoever occupies a permanent town residence well away from the plaza—as far away as four blocks—is breaking a prime social rule for membership in the top social ranks and needs to be certain of his secure place. In general, suburbio retains the meaning of the lower class area; the middle and upper class development of the suburbs has not proceeded as far as in the majority of Latin American cities (Hawthorn and Hawthorn, 1948a: 23).

Leonard, studying La Paz, Bolivia, emerged with conclusions strikingly similar to those of the Hawthorns.
He too found the more desirable residential areas surrounded the plaza, though a few upper-status families had moved to the periphery. Most of the Indian population was "along a fringe of settlement just outside the city limits where they build their own, inexpensive, mud or adobe huts . . ." (Leonard, 1948: 454).

Caplow's analysis of Guatemala City is one of the most interesting of Latin American studies, because he presents the reader with rich historical data to show how the ecological processes worked to bring about the city structure (Caplow, 1949). Visiting Guatemala City in 1948, Caplow found old maps and descriptions of the city which enabled him to trace its evolution in some detail. Thus he was able to show that the tradition of urban planning and the control of growth were supported by the legal and later customary restrictions on the residence of the indigenous population. Their location on the periphery of the city or even in communities apart from the city was gradually transformed from a strategic administrative policy to a time-honored custom. Similarly, the attachment of the upper class population to the center of the community arose from the planned location of the ruling group in colonial times . . . (Caplow, 1949: 129).

Yet, for all the varied sources which he used, Caplow emerged with essentially the same conclusions as previous investigators of Latin American ecology. In Guatemala City "the poorest and the least prosperous segments of the population are located peripherally," and "there is only one area of markedly poor housing within two kilometres of the commercial center" (Caplow, 1949: 125). This physical
structure is reflected in the social organization of the city, as public health problem areas "form almost a continuous border around the city," and "the percentage of non-attendance among children of school age rises consistently as one moves out toward the urban periphery" (Caplow, 1949: 125).

The Dotsons' study of Guadalajara (1954) is of particular relevance because their methodology is similar to that to be used in this research. Housing in all residential areas of the city was rated by direct observation. "Out of this experience came the conviction that five types of housing, sufficiently distinct to be differentiated quickly by external appearance, exist in this city" (Dotson and Dotson, 1954: 369). Class I consisted of modern upper-income houses, class II were colonial upper-income houses, class III were colonial and small modern middle-income houses, class IV were lower-middle and working-class houses, and class V were the "dwellings of the very poor" (Dotson and Dotson, 1954: 369). An index of residential telephones was also used, to support the housing classification. Both methods uncovered approximately the same patterns of residential housing areas, which the authors felt had three salient features:

(1) The housing near the commercial center is good, although most of it is certainly not the best in the city.
(2) The best housing forms a sector running westward from the center to the edge of the city.
(3) Except for this first-class sector, the city is completely surrounded by a fringe--of greatly varying depth, to be sure--of housing of the poorest quality (Dotson and Dotson, 1954: 370).

Thus the authors concluded that "modern Guadalajara conforms neither to the traditional Spanish American nor to the North American ecological pattern" (Dotson and Dotson, 1954: 372).

In his review of most of the aforementioned studies, Schnore pointed out that they contained strikingly similar results:

(1) All of the authors comment on the existence of the "traditional" or "colonial" pattern, in which higher-status groups tend to be found near the center.
(2) In every case, however, this pattern is reported to be in one or another stage of "breakdown."
(3) There is an apparent tendency for all of the cities--in Bolivia, Mexico, and Guatemala--to shift in the general direction of "the North American pattern" (Schnore, 1965: 358).

Their similarities notwithstanding, Schnore felt these studies of cities in Latin America neither confirmed nor denied the Burgess hypothesis, "simply because the necessary controls are lacking and because so many relevant items of information are missing" (Schnore, 1965: 376).

Though his study contains many useful ideas, and an excellent review of the methodological and theoretical problems involved in ecological studies, it appears that Schnore has failed to take account of a surprisingly similar finding of the studies. This finding is the uniform way in which upper-class residential areas move to the periphery; they do not seem to move directly from the center to the periphery, but rather move outward gradually from the center
in a particular area, or sector, of the city. As a result, the periphery of these cities is not becoming upper class. Only one segment of the periphery may be tending toward upper-class residence. Witness the findings of some of the various studies. In Mérida, Hansen found the "invasion of Santa Ana by upper-class persons from the center" (Hansen, 1941: 31). (Santa Ana is a barrio in the northern part of Mérida.) In Sucre, the Hawthorns found that "An estimated ten percent of exceptions to the rule that upper and middle-class houses stand near the plaza include a group of houses, newer than most buildings in the city, which stand separately in an area well away from the center, near a park" (Hawthorn and Hawthorn, 1948a: 22-23). In La Paz, Leonard found that "with the increase in number of privately owned automobiles and better public transportation, the white, and upper class, families are moving on down the valley, where they can secure more space as well as escape" (Leonard, 1948: 454). In Guatemala City, Caplow reports that "the development of the last half-century has followed the plan of an expanded center trailing suburbs in one direction . . . ." (Caplow, 1949: 124). As reported previously, in Guadalajara the Dotsons found "the best housing forms a sector running westward from the center to the edge of the city" (Dotson and Dotson, 1954: 370).

Another line of evidence is available to show that a shift toward the North American pattern of higher status residences on the periphery may be misleading. This is a
phenomenon well known to all students of the city in Latin America; it is the pervasiveness of the squatter settlement.

In Brazil it is called favela; in Argentina, banda de miseria; in Peru, barriada. In Colombia it is tugurio. But whatever the name, its characteristics are the same: It is the rudest kind of slum, clustering like a dirty beehive around the edges of any principal city in Latin America (Schulman, 1966: 30).

Clearly, peripheral slums do not conform to the North American concentric zone pattern. Just as clearly, there are upper-status residential areas moving to the periphery. This does not mean, however, as some of the studies mentioned have implied, that these upper-status areas will eventually replace the slums on the periphery. The current rapid growth of these slum areas indicates that they are likely to be with us for a long time, and will not be readily displaced. As a result, a theory of residential differentiation that gives only a part of the periphery to upper-status residences seems to be called for.

Though it does not provide such a theory, one recent study does agree with this interpretation, and calls for a modification of existing theory: "... it is suggested that a refinement of the model (of inverse-concentric circles and its reverse) is called for, that previous studies bear re-examination, and that future studies ought to be conceived in terms of the modification reported here" (Peñalosa, 1967: 229). This study of three small cities in the Mexican state of Guanajuato showed that
families of higher socioeconomic status are found primarily along arterials and importantly but to a somewhat lesser extent, in the vicinity of the plaza. The more industrialized the city, the more dispersed are the residences of the rich and comfortable from the central plaza (Peñalosa, 1967: 226).

As in other Latin American studies, the better residences move to the periphery in specific areas. To tentatively explain this movement, Peñalosa emphasized the importance of accessibility to the center of the city, and the key function played by major arterial streets in providing this accessibility.

It seems quite plausible that the concept of arterial accessibility may play an important role in the patterning of residences in Latin American cities. In the next chapter we shall be looking at this and other factors as possible determinants of the shape of residential distribution in a Latin American city.
Chapter III

PROCEDURES OF INVESTIGATION

Definition of the Problem

It is from what is here perceived as the complementary nature of trends in the three areas reviewed in the last chapter (the "classical" school of urban ecology, social area analysis, and the ecology of the city in Latin America) that the methodology for this study is derived. "Classical" ecology tells us that the dynamic processes of concentration, centralization, segregation, invasion, and succession gave us well-defined areas of the city, often termed "natural areas." These "natural areas" are the unit of analysis of "classical" ecologists, and have an important organizing and analytical function for any study of city structure; these "natural areas" look at the way social organization is spatially evidenced in the city.

From social area analysis, we find that "natural areas" are distributed through the city in certain patterns because of the way in which population characteristics are distributed. Specifically, the social space in which these areal units ("natural areas") are distributed seems based
upon the dimensions of socioeconomic status, family status, and ethnic status; these dimensions seem to be the major determinants of urban social structure.

While "classical" ecologists see "natural areas" as the means by which to investigate city organization, social area analysts see the dimensions of socioeconomic status, family status, and ethnic status as the means by which to investigate city organization. These two approaches study the city from different directions. One starts with the areas, and groups the areas to show patterns of organization. The other starts from the opposite side, and examines dimensions of organization, to be able to group areas. If this reasoning is correct, both approaches should add to our understanding of the structure of the city.

The implication of this reasoning for the study of Latin American cities is that one should be able to find the same general patterns of city structure that have been found by the "classical" approach by using a social area analysis approach. That is, while previous students of the structure of Latin American cities have used natural areas to show patterns of organization, a study examining dimensions of organization ought to emerge with comparable results. Carrying this logic one step further, it also seems that one could use aspects of both of these approaches, and expect results comparable to previous studies. In other words, areal analysis and social organization both have important organizing and analytical functions, and it is important to
understand the dynamic relationship between these two axes of urban ecology. This is what is planned for this study, in the context of a description of Cali, Colombia.

The research reported here is an ecological examination of the residential areas of Cali, Colombia. This research is based upon the author's field work in Cali, and is reported through the use of elements of both "classical" ecology and social area analysis, in the widest sense of the terms.

Data are assembled on the basis of the "barrio unit," which is somewhat analogous to the census tract in the United States. The central thrust of the research is the mapping of an indicator of socioeconomic status on a barrio basis, and two indicators of family status on a barrio basis. Ethnic status is not examined in this study, because data are not available. Housing is employed as an indicator of socioeconomic status. Number of family members and family units per housing unit are employed as indicators of family status.

Supporting the central thrust of the research are related data. Types of land use (residential, commercial, industrial, public-institutional) are mapped for the city of Cali. Population density data are also presented. Finally, the relationship of housing areas to major arterial streets in the city is examined.
Collection of the Data

Collection of the data was accomplished during the author's residence in Cali, from September, 1967, to June, 1968. The data come basically from two sources. Population and family data by barrio come from excellent compilations by the statistical section of the Cali Municipal Planning Office (Oficina de Planeación Municipal, Sección Estadística). These data are based upon the 1964 Colombian census. Housing and land use data come from a field survey by the author of the one hundred and fifty-seven barrios of Cali. In this survey, information on terrain, natural features and divisions, land use, functions focused in the barrio, historical information, and public amenities (such as streets, sidewalks, sewers, electricity, and water) were amassed. Detailed information on housing was also collected, including such things as size and type of house, maintenance, building material, presence of maids, yard decoration, type of flooring, and observable family belongings such as cars and television antennas. The field schedule for the Cali ecological study follows.

Field Schedule

Barrio

Terrain:  Level  Sloping  Hilly  On Steep
          Slope  On Ridge

Natural Divisions: (describe) (such as rivers, major highways, etc.)
Brorio Bordered by: (describe) (other brohios; farm land; airport; etc.)

Historical Background of Brorio; Origin; Has it been Planned; Is it a Legal or an Invasion Brorio

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Residential</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50-100%</td>
<td>50-100%</td>
<td>75-100%</td>
</tr>
<tr>
<td></td>
<td>10-50%</td>
<td>10-50%</td>
<td>50-75%</td>
</tr>
<tr>
<td>2-10%</td>
<td>Very Slight</td>
<td>2-10%</td>
<td>10-50%</td>
</tr>
<tr>
<td>2-10%</td>
<td>Very Slight</td>
<td></td>
<td>2-10%</td>
</tr>
<tr>
<td>Slight</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Functions Focused in Brorio: (describe) (bus "terminals," and number of bus lines serving the barric; university; sports area; markets; parks; a community building, or a meeting place for the junta communal; etc.)

Sanitary Facilities: Water: Private, in Homes ____ Public ____ Don't Know ____
Sanitary Sewers: Yes ____ No ____
Open Ditches for Sewage Observable: Yes ____ No ____
Privies Observable: Yes ___ No ___
Health Centers: Private ___ Public ___ None ___
                 Don't Know ___
Drugstores: Observed ___ No Observed ___
Electricity: Observed ___ Not Observed ___
Telephones in Barrio: Yes ___ No ___ Don't Know ___
                 Public ___ Residential ___
Sidewalks:  95-100% ___ 50-95% ___ 10-50% ___ 1-10% ___
                 None ___
Streets:    Paved: Good ___ Fair ___ Poor ___
                 Gravel: Good ___ Fair ___ Poor ___
                 Dirt:  Good ___ Fair ___ Poor ___
Residence:  (where possible, in percentages)
House Type:  Modern ___ Colonial  ___ "Stucco" ___
                 "Poor" ___ Temporary  ___
                 Houses Not Completed ___
House Sizes: Very Large ___ Large ___ Medium ___
                 Small ___ Very Small ___
Maintenance: Excellent ___ Good ___ Fair ___ Poor ___
                 Terrible ___
Building Material: Ornamental Stone or Brick ___ Pebbles
                 in Stucco ___ Stucco ___ Bamboo ___
                 Cardboard ___ Wood ___ Other ___
Yard Decoration: Shrubbery, Flowers, Lawn - Extensive ___
                 Some ___ A Very Small Bit of
                 Decoration ___ None ___
Maids Observable: Yes ___ No ___
In addition to this systematic data collection, two other sources of information were used. One of these sources was hundreds of highly informal chats with various barrio residents. By supplementing the statistical data concerning housing characteristics, they were helpful in determining the classification of the socioeconomic status of each barrio.

The other source of information was personal contacts of the author with residents of Cali. Particularly useful were acquaintances derived from the exceptionally considerate and congenial middle-class Colombian family with whom he lived. This family made it possible for the author to visit, often repeatedly, the homes of their friends and relatives throughout the city. This informal visiting, often to the poorer parts of the city, coupled with the folk anecdotes which were constantly related, led to a much greater understanding of the city than a field survey, by itself, could possibly have afforded.
Nature of the Data

The basic unit of analysis involved in the study of Cali, Colombia, is the barrio. Although the term barrio is often used in Latin America to mean "neighborhood," it is more properly viewed as a geographic administrative unit of the city. As a geographic unit, the barrio has generally been given a name for either historical or administrative purposes. The older barrios of Cali, a few of which go back nearly to the founding of the city in 1536, were often named after the churches which were located there. Examples of this are San Pedro, El Calvario, San Pascual, and San Bosco. Some of the newer barrios were named after the housing developments that were built in them, such as Unidad Venezolana and Prados del Norte-La Merced (popularly known as Vipasa). Other barrio names reflect the informal terms used by the residents of the barrio, such as Popular, Unión Vivienda Popular, and Obrero, or were named after various personages, such as Jorge Isaacs, Marco Fidel Suárez, Simón Bolívar, Alfonso López, and Lleras Camargo. Obviously, there is great variety in the sources of names for the barrios.

People were almost universally aware of the barrio in which they lived. This was especially true of the poorer classes; for them, the barrio served as an extended neighborhood. This is important for this study, because it indicates that the barrio is more than an administrative-
statistical construct and plays a role in the social organization of the city.

This role can be seen at least partly from the social division of the barrios of the city into barrios populares and barrios residenciales. The distinction between the two is basically economic. Popular barrios are poor, and residential barrios are fairly well-off, but there are exceptions, and it is not clear to which group some barrios belong. A popular barrio has an Acción Comunal, which is a junta elected by the people of the barrio to present the needs of the barrio (such as street paving, water, etc.) to the City Planning Office. The juntas also undertake various projects in the barrios, such as landscaping an open plaza, or helping barrio residents hit by a catastrophe. Over one hundred barrios in Cali have such juntas.

It might still be objected that using the barrio as the basic unit is "arbitrary," and that the difference between one barrio and another is simply an artifact of drawing random lines. However, from a practical standpoint, this is all we have; this is the smallest breakdown of data that is available. From a theoretical standpoint, the objection seems probably less valid than similar objections that have been raised about the use of the census tract in the United States. In the United States, most census tracts were drawn several decades ago. With the growth of the city, and the movement of the population, these tracts have in many cases come to be less homogeneous than they were
when they were first drawn. In Cali, much of the growth of the city has been more recent; it grew from a population of 284,186 in 1951 to a population of 637,929 in 1964. Thus many of the barrios in the city are new. The boundary lines of these new barrios almost always were drawn on the basis of homogeneous areas, according to conversations with staff members of the Cali Municipal Planning Office; observation confirmed this homogeneity. Though there were some exceptions (mainly in the commercial center of the city), it seemed to this observer that the older barrios in the city also exhibited striking internal residential homogeneity.

At the time of the field work there were one hundred and fifty-seven barrios in the city for which data were collected, but not all of them are residential. Some are composed entirely of institutions, such as the main public hospital and the air force base. Others have such a small population that their inclusion would be meaningless. For example, barrio Paso-Ancho had a 1964 population of one! The population range among the barrios is unfortunately large, ranging from less than one hundred to more than twenty-eight thousand for barrio Alfonso López.

For most of the purposes of this study, two types of barrios included in the field survey and in the statistical compilation of data by the Municipal Planning Office will be eliminated.¹ The first type consists of specialized,

¹For a very few of the eliminated barrios included in the statistical compilation of data by the Cali Municipal Planning Office, data were incomplete.
generally nonresidential barrios. These include the water reservoir, a municipal park, railroad repair yards, an air force base, the water aqueduct and plant, the main prison, a psychiatric hospital, army barracks and base, a cemetery, a country club, a sugar mill and fields, the university (Universidad del Valle) and the university hospital, a women's prison, and a race track (horse races). There are twelve such specialized barrios. Although a number of other barrios were heavily commercial or industrial, in every case they contained a sizable residential population as well, and therefore will be included in the study of residential ecology.

The second type of eliminated barrio consists of "rural-oriented" areas that have recently been included in the statistics for the city of Cali. There are fourteen of these barrios. None has a population in excess of eight hundred, and all but two have a population of less than three hundred. These barrios were eliminated because it was felt they were not representative of urban social structure, but of rural social structure; their inclusion could have seriously biased findings oriented to urban residential differentiation. In the field work, it was patently obvious that these people were not oriented to the city. Virtually all of them were engaged in agricultural occupations, and had lived there for a long time. The rapid growth of the city boundaries, which often extended far beyond the area of settlement, had simply included much of the rural hinterland.
Many of the people, in fact, denied that they were connected in any way to the city of Cali.

One well-known author of a number of studies of urban ecology has pointed out the dangers of including rural areas in studies of urban structure. In an examination of theoretical and methodological implications of his comparative studies of Boston and Helsinki, Frank Sweetser commented that

the evidence is not entirely clear, but it is at least highly suggestive, and it leads to one practical conclusion—that in the delimitation of metropolitan communities for factorial ecological analysis, careful attention ought to be paid to the outer boundaries chosen. Boundaries too narrow—geographically constrictive city limits, for example—may produce distortion through an overemphasis on the inner city mode of differentiation. Boundaries too wide—extended metropolitan regions, for example—may introduce unwanted effects of the rural-urban mode of differentiation (Sweetser, 1969: 451).

This study is not a factorial ecological analysis, but it appears the principle is the same. Our examination of indicators of socioeconomic status and family status would almost certainly be affected by a rural-urban mode of differentiation. To include these rural areas would have meant including a new dimension that would have been difficult, if not impossible, to control in this study.

With the elimination of the twelve specialized barrios and the fourteen rural barrios, there remain one hundred and thirty-one barrios upon which the study of the residential ecology of Cali will be based. The population distribution of these remaining barrios is given in Table 1.
TABLE 1

POPULATION RANGE OF CALI BARRIOS USED IN STUDYING RESIDENTIAL ECOLOGY

<table>
<thead>
<tr>
<th>Population Range</th>
<th>Number of Barrios</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 999</td>
<td>16</td>
</tr>
<tr>
<td>1000 - 2999</td>
<td>43</td>
</tr>
<tr>
<td>3000 - 4999</td>
<td>29</td>
</tr>
<tr>
<td>5000 - 9999</td>
<td>29</td>
</tr>
<tr>
<td>10000 - 14999</td>
<td>8</td>
</tr>
<tr>
<td>15000 - 19999</td>
<td>4</td>
</tr>
<tr>
<td>20000 - 29999</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>131</td>
</tr>
</tbody>
</table>

As related earlier, the central thrust of the investigation is to study the effect of socioeconomic status and family status on the residential differentiation of the city. Having established the rationale for using the barrio as the basic unit of analysis, and having delineated the universe of barrios, we turn now to a consideration of socioeconomic status and family status, and the indicators used in measuring these.

The main indicator used to measure socioeconomic status is housing; the use of one basic indicator for such an important dimension of urban differentiation requires both explanation and justification. In their theoretical elaboration of social area analysis, Shevky and Bell used nine types of sample statistics to measure the social rank (socioeconomic status) construct. These were years of schooling, employment status, class of worker, major
occupation group, value of home, rent by dwelling unit, plumbing and repair, persons per room, and heating and refrigeration (Shevky and Bell, 1961: 228). For our study, systematic education and occupation data by barrio were not available, and there was no way in which we could systematically include these variables in a measure of socioeconomic status. Likewise specific barrio-by-barrio data for value of home, rent by dwelling unit, plumbing and repair, persons per room, and heating and refrigeration could not be obtained. Very early in the study, however, it became apparent that a barrio-by-barrio field survey of housing could include most of the important aspects of this latter group of five sample statistics, and thus allow the construction of a typology of barrios by socioeconomic status.

The field survey was oriented to the construction of this typology. The classification scheme ranged from one to six, with one being the highest and six being the lowest. After a survey of each barrio, a number in this socioeconomic classification was assigned to it. A one meant that the barrio was well-to-do, being upper class. A two meant the barrio was well off, though clearly not so much so as the one barrios; these barrios were comprised mainly of the middle class. A three referred to a lower-middle-class barrio, where the people were clearly above the working class, but not very well off. A four referred to the stable working-class barrio which was somewhat more secure and
established than the bulk of the working-class barrios. The poor but usually-employed working class, who lived on the margins of real poverty, lived in barrios which were classed five. These were the most prevalent barrios in the city. The desperately poor, who had to struggle each day just to survive, lived in barrios classed as six. These were the slum barrios often referred to as tugurios.

There was surprisingly little difficulty in differentiating among these classifications. Perhaps because of living in the city for more than five months before the field survey was undertaken, and thus having acquired great familiarity with housing types within the city, it was usually quite clear to which category a barrio belonged, once the field survey of each barrio had been completed. This categorization was supported by on-the-spot observations of electricity, sidewalks, sewage systems, internal plumbing, and the factors included in the field schedule.

The six-fold classification was chosen because it seemed the clearest to the author, and because it afforded a check on the reliability of the field-survey data. The Cali Municipal Planning Office had previously classified all the barrios of Cali according to "RS" status, which ranged from one to six, with one being the highest and six being the lowest. "RS" referred to socioeconomic status, and was composed of such indicators as water, sewage, type of house construction, paved streets, transportation, education, health, culture, green zones, and community juntas (Oficina
de Planeación Municipal, "Estratificación Socio-Económica . . .," n.d.; Oficina de Planeación Municipal, "Distribución de la Población . . .," n.d.). These indicators were assigned point values (0, 5, or 10), and the classifications were delineated on the basis of point totals. (Unfortunately, some of these data were missing, which made it impossible to use these data directly.) When the results of the field survey were compared with this classification, the similarities were striking. Of the one hundred and thirty-one barrios to be used in the examination of residential ecology, only sixteen were classified differently by the two methods, and in not a single instance was the difference greater than one. Of these sixteen barrios, thirteen were classified lower and three higher. The reason for this deviation, generally, was the tendency for a few extremes to differentially weight the RS rankings of the Cali Municipal Planning Office. In a few cases the difference was a result of different time periods; the Municipal Planning Office data were gathered several years prior to the field survey.

In the field survey, it should be noted that the general housing characteristics used to classify the barrios according to socioeconomic status were supported by much informal data on such things as education, occupation, and

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2 It should be noted that not all of the one hundred and thirty-one barrios had been classified by the Municipal Planning Office. Data were unavailable for eight of these barrios.
income obtained through informal chats with *barrio* residents. This should give additional validity to the six-fold classification of *barrios* by socioeconomic status based on the general criterion of housing.

A question of somewhat greater importance is whether the use of housing is valid as a measure of socioeconomic status, or, put another way, whether one can discriminate among socioeconomic status levels on the basis of external housing appearances.

Caplow, in his study of the ecology of Guatemala City, discussed this as an important factor, and did not feel housing could be used in this way.

While location near the center remained an important element of status, it is striking that the use of housing itself as a form of conspicuous display or as a means of social mobility was inhibited by a number of characteristics in the Spanish colonial housing pattern. Both the climate and the culture helped to maintain the interior privacy of the dwelling which turned a blank wall or barred windows toward the street. This, added to the one-story limitation, accounts for the curious fact that even today it is sometimes impossible to distinguish between the four-room marginal slum dwelling in a built-up area and the twenty-room palace which may be next to it, by their external appearance (Caplow, 1949: 130).

Perhaps Guatemala City is different from the rest of Latin America, though this seems highly doubtful. Excepting this possibility, one wonders how a trained observer with much experience in Latin America could arrive at Caplow's conclusion. Richard Morse, one of the outstanding experts on the city in Latin America, and especially the colonial Latin American city, holds views diametrically opposed to
those of Caplow. In one of his brilliant reviews of recent research on Latin American urbanization, Morse talks of Latin America as an area "where conspicuous consumption motivates the upper class" (Morse, 1969: 498), where "For many observers urban shanty towns are the most spectacular visible hallmark of the social composition of a Latin American city (though the mansions of the rich run them a close second)" (Morse, 1969: 488). Whiteford, in talking about the upper class in Querétaro, Mexico, noted that "A large house was one of the most important symbols of social position" (Whiteford, 1964: 69-70). In Popayán, Colombia, Whiteford implied that external appearance also distinguished lower class homes.

In Popayán, as in Querétaro, they [the lower classes] lived in crowded, inadequate, unsanitary rooms scattered throughout the city, or were concentrated in various undesirable areas on its peripheries. In the Barrio Alfonso López Viejo . . . houses were small, poorly built, and almost totally without utilities. Most of them were built of unplastered, unpainted adobe blocks and, of 240 houses, 116 had only one window, and 65 had no windows at all; 134 had no running water, 188 had no toilets, and 191 consisted of three small rooms or less (Whiteford, as quoted in Smith, 1967: 367).

In the Dotsons' study of Guadalajara, Mexico, which was commented on previously in this study, they came to the "conviction that five types of housing, sufficiently distinct to be differentiated quickly by external appearance, exist in this city" (Dotson and Dotson, 1954: 369).

Faris, in reviewing the work of urban ecologists in the United States, noted that
... a strong connection exists between urban ecological research and the study of socio-economic differentiation which has been in so great vogue in recent years. The schematic zones of the city do describe variations of social class levels almost as well as any other factor, except perhaps for the variable of education. Some scales devised to measure social differentiation in fact employ area of residence as one of the variables (Faris, 1967: 63).

In sum, the position taken by Caplow seems to have little support. The preponderant weight of evidence seems to be that housing is a reflection of socioeconomic status. Thus the socioeconomic status of city areas (e.g., barrios) can be delineated on the basis of the external appearance of housing.

Housing having been justified as a valid indicator of socioeconomic status, our attention turns to a consideration of the indicators used to measure family status. Shevky and Bell used four types of sample statistics to measure the urbanization (family status) construct: age and sex, owner or tenant, house structure, and persons in household (Shevky and Bell, 1961: 228). These broke down to a fertility score, a women-in-the-labor-force score, and a single-family-detached-dwelling-units score (Shevky and Bell, 1961: 231-232).

Fertility data and women-in-the-labor-force data, by barrio, are not available for the city of Cali. However, data pertaining to the number of family members, by barrio, are available. These data, though not the functional equivalent of fertility, should also measure "differentiation of function," one of the key postulates concerning industrial
society posited by Shevky and Bell (1961: 228). In addition, data giving number of family units per housing unit by barrio are available; these data are similar to Shevky and Bell's single-family-detached-dwelling-units score.

All data for the indicators used to measure family status were obtained from the Cali Municipal Planning Office and are based on the 1964 Colombian census results (Oficina de Planeación Municipal, "Distribución de la Población . . ." n.d.). Data are available for all of the one hundred and thirty-one barrios included in the study of the residential ecology of Cali.

Lack of data measuring the participation of women in the labor force, a basic aspect of the Shevky-Bell urbanization (family status) construct for which data are not available, may not be serious. This is because, first, the participation of women in the labor force is generally not a highly significant factor until a city reaches some advanced stage of industrial maturity, which Cali has not yet reached, and second, Latin America has a very low level of labor force participation by women. As Abu-Lughod points out in her examination of the theory of social area analysis, "The proportion of females in the labor force does not relate closely to variations in family types in those societies where the over-all proportion is either very high or very low" (Abu-Lughod, 1969: 202). She suggests the use of substitute measures in cross-cultural applications of social area analysis. One of these measures is average family size,
which we are using in this study (number of family members) (Abu-Lughod, 1969: 202-203).

Data relating to the growth of the barrios and their density are used to support the discussions of socioeconomic status and family status. These data, obtained from the Cali Municipal Planning Office, are based on the 1951 and the 1964 Colombian censuses (Oficina de Planeación Municipal, "Comparativo Por Sectores . . ."). Also supporting the discussion of socioeconomic status and family status are data relating to the distribution of various land uses in the city of Cali. These data were obtained through the field survey.

Finally, information concerning major arterial streets will be offered, on the assumption that residential location in Latin American cities is and has been determined, at least in part, on the basis of the accessibility of transportation. Smith and McMahan make this explicit.

One who has visited South American cities can hardly have failed to notice that the worst slums frequently are on the very outskirts of the communities and that Rio de Janeiro's favelas, the miserable quarters in which a large share of the Negroes live, are spread over the hills which overlook the city. Such observations suggest that the availability and cost of transportation are basic factors in determining the ecological pattern of any city.

The abundance of rapid, cheap, and convenient transportation, and especially the automobile, seems largely responsible for the fact that in [North] American cities generally the most undesirable residential districts are those nearest the center, whereas the most desirable are at the greatest distance from the downtown areas. On the other hand, in Buenos Aires, Santiago de Chile, Lima, and other such cities, where the automobile is still a luxury, residences of the least privileged classes are
relegated to the more remote sections (Smith and McMahan, as quoted in Schnore, 1965: 381).

Presentation and Interpretation of the Data

This study is essentially descriptive. Data pertaining to density, growth, land use, socioeconomic status, and family status are mapped. Mapping has been chosen as the method of data presentation because it seems the most comprehensive and the easiest to understand. Tables are used as a supplementary method of data presentation whenever they seem appropriate.

Several approaches are used in interpreting the results. The first, and most important, is a "common sense" approach, whereby the various maps are examined carefully to see if any obvious patterns or configurations appear.

The second approach is inspired by that used by Anderson and Egeland (1961) in their study of the spatial aspects of social area analysis. Barrios of the city are marked off, ranging from the center to the periphery, and are examined for differences in family status. Details of the procedure are presented when it is utilized.

The third and final approach is to determine if barrios of high socioeconomic status show a greater relation to major arterial streets than do barrios of low socioeconomic status. The procedure adopted here, to be explained when it is used, is inspired by the Peñalosa study (1967).
This study makes no claims to methodological innovation, and indeed does not wish to do so. In an area of the world where patterns of residential differentiation, other than "traditional" patterns, are essentially unknown, it seems wise to use methodological tools that have already been used in other areas, such as the United States, if we are going to have much hope of comparing our results to those studies. Further, studies which are "one-of-a-kind" usually add very little to the generation of basic theory, which ought to be part of the long-range hope of most research. In sum, in this study we do not wish to confuse findings of content with findings of method.

Before we can meaningfully present the findings of content, a comprehensive picture of the city with which we are working must be drawn. It is to this task that we turn in the next chapter.
Chapter IV

CALI: FROM COLONIAL TOWN TO INDUSTRIAL CITY

Shortly after the conquest of Peru, one of Pizarro's lieutenants, Don Sebastián de Belalcázar, marched north from Peru to explore what is today Ecuador and southern Colombia. He established cities as he went, and upon his arrival in the Cauca Valley in Colombia in 1536 founded the city of Cali.

At this time the broad Cauca Valley was heavily populated with Indian villages. Because of the fierce nature of these Indians, they fought the Spanish, and through war and subsequent famine were virtually exterminated (Cieza de León, 1864: 93-97). This explains why Cali, virtually from its inception, had so few Indians. Yet the city was apparently named after these Indians, as Smith notes that "the Indians of the Cauca Valley were the Lili or Cali" (Smith, 1970: 67).

The Spaniards who first settled in Cali appear to have been Castilians (Smith, 1970: 70). Bringing with them a Spanish culture which had been involved with "appropriating lands reconquered from Islam" (Morse, 1969: 475), they
divided the lands and devoted themselves to cattle raising rather than to intensive tillage of the soil. "Less than a generation sufficed for the Spaniards to convert the once intensively tilled bottom lands [of Indian times] into . . . pastures" (Smith, 1967: 66).

Unlike many of today's largest Latin American cities, which early acquired political importance, Cali was completely overshadowed by Popayán, about seventy miles to the south, and it long remained a minor town in the social, economic, and political sense. Cali did not emerge as a major Latin American city until the twentieth century. During the colonial period, all of the important affairs were handled by Popayán. It was Popayán which became "the capital of an intendencia which stretched from Ecuador to the Caribbean . . ." (Whiteford, 1964: 9), and it was Popayán which was granted a charter and a coat of arms, and became "the seat of a university, and an important center in the hierarchy of the church" (Whiteford, 1964: 10).

Throughout the colonial period, Cali was of very secondary importance to Popayán, and was not much more "important" than several other small towns in the Cauca Valley, such as Buga, Cartago, Anserma, and Tuluá. Indeed, much of the colonial history of Cali is replete with the economic and political marginality of the town, with references to commercial decline (ca. 1580) (Arboleda, I, 1956: 92), economic prostration (ca. 1618) (Arboleda, I, 1956: 167), litigation over boundaries with neighboring towns,
such as Buga (ca. 1668-1680) (Arboleda, I, 1956: 283, 304), the economic difficulty of the city because of "la decadencia de la ganadería" (ca. 1690) (Arboleda, I, 1956: 317), which was a repeated theme (ca. 1753) (Arboleda, II, 1956: 82-83), "La ganadería iba siempre en desmedro," (ca. 1754) (Arboleda, II, 1956: 265), restriction of municipal autonomy (ca. 1739) (Arboleda, II, 1956: 113-114), prohibition of foreign commerce (ca. 1745) (Arboleda, II, 1956: 121), economic depression (ca. 1770) (Arboleda, II, 1956: 360), the prohibition against sending cattle beyond municipal boundaries (ca. 1788) (Arboleda, III, 1956: 66-67), and a boundary dispute with Cartage (ca. 1791) (Arboleda, III, 1956: 109). Taken together, these references give a picture of a colonial town that was important only in its local area, and not in the wider region. Concern was devoted almost exclusively to local matters, and it was not until the 1800's, with the outbreak of the cry for independence, that Cali began to assume some regional importance, when the city demanded the division of the province dominated by Popayán, and hosted a meeting of representatives from cities in the area for this purpose (Arboleda, III, 1956: 285-310). Cali early rebelled against the Spanish, while Popayán was a Spanish stronghold. "On the outbreak of the independence war Buga, Cartago, Caloto, Toro, and Anserma were all quick to join Cali in a 6-city federation to challenge the power of absentee Spanish landlords" (Friedel and Jimenez, 1971: 67).
While it is clearly impossible to ascribe the transformation from a town to a large city to a single factor, or a single set of factors, it does appear that the regional leadership exercised by Cali during the Independence period, along with its support for the lessening of Popayán's sphere of influence, led to Cali's clear emergence, in the early 1800's, as a "first among equals" of the cities in the Cauca Valley region. This was a formative period in Colombia's history as a nation, for "the warfare that characterized the Spanish American Independence movements was of such intensity and duration (1810-28) that it could not help but affect the societies of the nations involved" (Maingot, 1969: 297). At the same time that Cali was achieving this local predominance, Popayán was in decline, a decline that took place throughout the nineteenth century, though it was perhaps most pronounced in the middle of the century, when Popayán's vast territories were divided. As Whiteford notes,

As Popayán . . . was divested of its richer lands, which became part of the wealth of new or neighboring states, its fortunes declined drastically. Its rich and fertile valleys became the state of Valle del Cauca, its mines, which once supported the aristocracy in a life of royal wealth, passed to the states of Nariño and Antioquia, and even its mountainous southerly regions of unexplored but potential riches were turned over to the state of Huila. Popayán was left to rule a decimated state, small in size, and composed principally of rolling hills and unexplored mountains. The shock of loss, the feeling of impoverishment . . . led to a paralysis, an inactivity, which deterred and impeded the full and active exploitation and development of those resources and potentialities which did remain. The result was stagnation. . . . Increasingly, [Popayán] became isolated . . . , and traffic with the outside world
dwindled at the very time when other cities were expanding their commerce and increasing their relationships with other regions and other nations. Popayán was superseded by Cali as the principal city of southern Colombia . . . (Whiteford, 1964: 11-12).

Colombia is a country of extreme regionalism, and each of the main regions seems to focus on an important urban center.

Today at least four principal regions are significant in terms of population and resources. Each also has a major urban center. These regions are: the eastern cordillera, centered on Bogotá; the department of Antioquia and its southern extension, Caldas, centered on Medellín; the Valle del Cauca in southwestern Colombia, formerly focused on Popayán, now on the economically and demographically burgeoning Cali; and the Atlantic coastal region, once with Cartagena as its principal city, but with Barranquilla now dominant (Dix, 1967: 21).

Thus Popayán's decline left a socioeconomic void in southern Colombia, a void that Cali began to fill.

Yet regional leadership alone cannot account for Cali's development as an industrial city. Other factors, such as a rich agricultural hinterland, la violencia, which drove many southern Colombians from their rural homes to the safety of the cities, the port of Buenaventura and the development of Cali as a transportation nucleus, and foreign investment must surely have been important. Another factor contributing to Cali's eventual rapid urbanization is that "Valle was more 'urbanized' and unified than most regions because many of its 16th-century village nuclei had survived . . ." (Friedel and Jimenez, 1971: 67). One factor that has probably not been important in Cali's rise to prominence is the Catholic Church. Unlike many large Latin
American cities, Cali was not a religious center of importance, and only in 1964 was it made an archdiocese.

**The Growth of the City**

The reconstruction of the demographic history of Cali is difficult. There are no census figures for the first two hundred and fifty years of its existence, and figures for all except the 1938, 1951, and 1964 censuses leave much to be desired. Of course, even the 1938, 1951, and 1964 censuses have shortcomings, though they become progressively better. Those figures that are available are given in Table 2.

This table shows that, at the outbreak of the Wars of Independence in the early nineteenth century, Cali was still a relatively small city which grew very slowly for nearly a century. With the exception of the 1840s, when "Cali's growth spurt . . . seems explainable by an influx of freed slaves and the Cauca tobacco boom" (Friedel and Jimenez, 1971: 67), the average annual growth rate until 1893 was considerably less than one per cent. From 1893 to 1905, Cali grew rapidly, at an average growth rate of nearly seven per cent per year. Much of this growth is probably attributable to the coffee boom, for "it developed an internal market, creating a large class of small independent farmers in Antioquia, Caldas, and Valle . . . [and] brought prosperity to . . . most of the nation's cities" (Friedel and Jimenez, 1971: 72-73). From 1905 to 1912, the city's
# TABLE 2

GROWTH OF CALI FROM 1793 TO 1964

<table>
<thead>
<tr>
<th>Year</th>
<th>Inhabitants</th>
</tr>
</thead>
<tbody>
<tr>
<td>1793</td>
<td>6,548</td>
</tr>
<tr>
<td>1797</td>
<td>5,690</td>
</tr>
<tr>
<td>1807</td>
<td>7,192</td>
</tr>
<tr>
<td>1836</td>
<td>8,000</td>
</tr>
<tr>
<td>1851</td>
<td>11,848</td>
</tr>
<tr>
<td>1870</td>
<td>12,743</td>
</tr>
<tr>
<td>1893</td>
<td>14,000</td>
</tr>
<tr>
<td>1905</td>
<td>30,740</td>
</tr>
<tr>
<td>1912</td>
<td>27,747</td>
</tr>
<tr>
<td>1918</td>
<td>45,525</td>
</tr>
<tr>
<td>1928</td>
<td>122,847</td>
</tr>
<tr>
<td>1938</td>
<td>101,038</td>
</tr>
<tr>
<td>1951</td>
<td>284,186</td>
</tr>
<tr>
<td>1964</td>
<td>637,929</td>
</tr>
</tbody>
</table>


Source for other years: McGreevey, 1967(?). ("The data presented here are derived entirely from published sources available at the University of California Library at Berkeley.")
population declined, for unknown reasons. From 1912 on, the city entered into a period of growth that has not yet ceased. This growth stems from several important factors. In 1915, the Pacific Line railroad linked Cali with the port of Buenaventura, and, via the newly-opened Panama Canal, Europe and the eastern coast of the United States, and "soon these two cities were the major coffee shippers from Caldas, Valle, Tolima, and southern Antioquia" (Friedel and Jimenez, 1971: 74). The transportation link with the port of Buenaventura, the coffee boom, and the relatively large population base in the hinterland around Cali probably all played a role in the incipient industrialization that began in Cali around 1920. At the same time, Cali was becoming the commercial center of Valle, and this too contributed to its steady growth during the twentieth century.

Around 1950, another factor leading to great population growth added its force to the factors of burgeoning industrialization and commercial vigor that were already at work. This was la violencia, which was to be a significant factor in Cali's growth for the next fifteen years.

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1It is entirely possible that the census figures are in error, and that no decline took place. While the 1912 census figures appear to have some validity, there is a possibility that the 1905 figures may be inflated.

2While the figures in Table 2 show a population decline between 1928 and 1938, it is probable that there was a steady increase in the population between 1918 and 1938. The 1928 population total is almost certainly highly inflated, which would account for both a too-steep rise from 1918 to 1928 and a decline from 1928 to 1938.
"La violencia . . . is a general term which . . . [is] used to refer to banditry, kidnappings, and homicides, particularly in rural areas" (Payne, 1968: 91). Dix notes that "in the years between 1948 and 1964, la violencia took between 100,000 and 200,000 Colombian lives, perhaps more than in all of the country's nineteenth-century internal strife, and was responsible for an undetermined number of maimed and wounded" (Dix, 1967: 362). While few authorities agree on the exact number of lives lost in la violencia, the magnitude of the loss was certainly great enough to cause huge numbers of rural dwellers to flee to the sanctuary of the larger cities, which were relatively free of the violence. Cali received a large share of these migrants, because la violencia was especially pronounced in southern Colombia and the province of El Valle, in which Cali is located. The following account indicates the extent and impact of this violence:

Between March 19 and 22 [1955], in El Valle, two brothers were assassinated by pistol fire; a coffee-roaster was killed by stab wounds and his place of business sacked; a man was shot and killed by "long-range" fire; the body of another was found dead of bullet wounds on a lonely road; and a hacienda owner was killed by seven bullets fired at close range. Total in El Valle killed by persons unknown, seven. In these same days, many people fled for safety from the district of Monteloro (El Valle); a Cali newspaperman was threatened with death because of stories he had written about the violence; panic spread through the area (Fluharty, 1957: 271).

Clearly, migration from country to city in Colombia "is intensified by the violent fighting between Conservative and Liberal villages, which has scared thousands of country
people into the 'safety' of the city . . ." (Powelson, 1964: 30). La violencia, then, is one of the chief causes of recent migration to Cali. Another is the "city's rapid industrial growth [which] has given it a sort of El Dorado reputation that exerts a magnetic effect on peasants who are tired of the meager existence of the countryside" (Holt, 1964: 165). Yet one should probably not overestimate the magnitude of the industrial pull on these rural peoples, for the land-tenure system and the agrarian reform laws have undoubtedly had a strong influence in "pushing" many rural dwellers out of the countryside. As Smith notes, other forces leading to migration are also at work, such as more modern transportation and communication, educational improvements and aspirations, social legislation, and social ferment among the masses (Smith, 1970: 109). In fact, the causes of migration are complex and intertwined, and specific causes for individual migrants often cannot be ascertained.

What can be ascertained, at least for the recent period of Cali's history, is the effect of migration on the city's growth. The Cali Oficina de Planeación Municipal estimated that approximately 43 per cent of Cali's growth during the 1951-1964 period was attributable to migration, while a report prepared for CELADE assumes "that 62.3 per cent of Cali's urban growth was derived from in-migration in recent years" (McGreevey, 1965: 6). Probably the most accurate estimates of migration to Cali are those based on
sex and age distributions made by McGreevey. He found that 101,132 migrants came to Cali in the 1938-1951 period, and constituted 67 per cent of the adult population in 1951; and that 210,232 migrants came to Cali in the 1951-1964 period, and constituted 58.9 per cent of the adult population in 1964 (McGreevey, 1965: 14). Most of the migrants "were of working age on arrival and the majority (53.9 per cent in the first period, 54.3 per cent in the second) were female" (McGreevey, 1965: 16); "census figures in Colombia . . . indicate that older people tend to stay in the rural areas" (Beyer, 1967: 207). McGreevey's figures, cited above, indicate that while the total numbers of migrants were increasing, the percentage of the total population of the city that was of migrant origin was decreasing. Given the size of the city, which in the early 1970s has reached perhaps one million people, this is almost inevitable. Increasingly, natural increase (the importance of which has tended to be underestimated by social scientists) should account for the largest part of the city's growth. Further, la violencia has ceased to be a major cause of migration from rural areas, although sporadic violent incidents still occur. In fact, it is probable that la violencia seriously depopulated some rural areas in Colombia, so that the ultimate rural source of migrants is not nearly as fertile as it was in the past few decades.

While the origins of the migrant stream to Cali were in the rural areas, evidence from recent Latin American
migrant studies (Browning and Feindt, 1971; Leeds and Leeds, 1967; Morse, 1971b; Beyer, 1967) indicates that rural dwellers migrate to small towns, and their offspring then go on to the larger urban areas. Thus migrants to urban areas are considerably more "urbanized" than had at first been realized. There is some evidence that this may be the case with Cali (though the extreme migration induced by la violencia may have altered "normal" patterns of migration). McGreevey notes that migrants to the city have a lower rate of unemployment than do native-born Caleños. While native-born Caleños made up less than 20 per cent of the labor force, they contributed 25 per cent of the unemployed population. . . . there can be little doubt that the migrants contribute more to production than they use up in consumption, at least as compared to the native-born population (McGreevey, 1965: 12).

Whatever the role of the migrant in an economic sense, there can be no doubt that migration in a demographic sense has made Cali one of the largest cities in Colombia and Latin America. This demographic growth is one of the key determinants of change in physical pattern . . . Moreover, the "components" of population growth (for example, net migration versus natural increase) may exert an influence on spatial patterns; in general, growth via migration will probably be more conducive to change (Schnore, 1965: 381-382).

Cities in Colombia and Latin America

Table 3 shows the population of the Cali municipio for the years 1905, 1918, 1951, and 1964 in relation to the other ten largest municipios in Colombia on these dates. From this table, it is evident that Cali in 1964
<table>
<thead>
<tr>
<th>Municipio</th>
<th>1905</th>
<th>1918</th>
<th>1938</th>
<th>1951</th>
<th>1964</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bogotá</td>
<td>100,000</td>
<td>143,994</td>
<td>330,312</td>
<td>648,324</td>
<td>1,697,311</td>
</tr>
<tr>
<td>Medellín</td>
<td>54,916</td>
<td>79,146</td>
<td>168,266</td>
<td>358,189</td>
<td>772,887</td>
</tr>
<tr>
<td>Cali</td>
<td>30,740</td>
<td>45,525</td>
<td>101,038</td>
<td>284,186</td>
<td>637,929</td>
</tr>
<tr>
<td>Barranquilla</td>
<td>40,115</td>
<td>64,543</td>
<td>152,348</td>
<td>279,627</td>
<td>498,301</td>
</tr>
<tr>
<td>Cartagena</td>
<td>9,681</td>
<td>51,382</td>
<td>84,937</td>
<td>128,877</td>
<td>242,085</td>
</tr>
<tr>
<td>Bucaramanga</td>
<td>20,314</td>
<td>24,919</td>
<td>51,283</td>
<td>112,252</td>
<td>229,748</td>
</tr>
<tr>
<td>Manizales</td>
<td>24,656</td>
<td>43,203</td>
<td>86,027</td>
<td>126,201</td>
<td>221,916</td>
</tr>
<tr>
<td>Pereira</td>
<td>19,036</td>
<td>24,735</td>
<td>60,492</td>
<td>115,342</td>
<td>188,365</td>
</tr>
<tr>
<td>Cúcuta</td>
<td>15,312</td>
<td>29,400</td>
<td>57,248</td>
<td>95,150</td>
<td>175,336</td>
</tr>
<tr>
<td>Ibagué</td>
<td>24,566</td>
<td>30,255</td>
<td>61,447</td>
<td>98,695</td>
<td>163,661</td>
</tr>
<tr>
<td>Palmira</td>
<td>26,406</td>
<td>27,032</td>
<td>44,788</td>
<td>80,957</td>
<td>140,889</td>
</tr>
</tbody>
</table>

Source: McGreevey, 1967(?): Table I.
has clearly become the third largest city in Colombia.

While Cali grew at an annual average rate of 8.3 per cent between 1938 and 1951, and 6.3 per cent between 1951 and 1964, Colombia grew at an annual average rate of 2.1 per cent for the 1938-1951 period, and 3.3 per cent for the 1951-1964 period. No other major Colombian city grew as fast as Cali in the 1938-1951 period, and only Bogotá among the major cities exceeded Cali's rate of growth in the 1951-1964 period.

During the recent period of rapid growth (1938-1964), Cali has steadily increased its share of the total national population from 1.2 per cent in 1938 to 3.6 per cent in 1964, as can be seen in Table 4.

**TABLE 4**

GROWTH OF CALI IN RELATION TO THE GROWTH OF COLOMBIA: 1938-1951, 1951-1964

<table>
<thead>
<tr>
<th>Year</th>
<th>Cali</th>
<th>Colombia</th>
<th>Percentage of Colombia's Population in Cali</th>
</tr>
</thead>
<tbody>
<tr>
<td>1938</td>
<td>101,038</td>
<td>8,701,816</td>
<td>1.2</td>
</tr>
<tr>
<td>1951</td>
<td>284,186</td>
<td>11,548,172</td>
<td>2.5</td>
</tr>
<tr>
<td>1964</td>
<td>637,929</td>
<td>17,484,508</td>
<td>3.6</td>
</tr>
</tbody>
</table>


While some, such as Schnore, have contended that the population growth of the city is closely connected to the population growth of the national population (Schnore, 1971: 38),
it is apparent that Cali's growth has run well ahead of national population growth during this period. This seems due to the pronounced effect of migration on Cali's growth. As migration declines in importance as a factor in Cali's growth, as it now seems to be doing, and natural increase becomes a more predominant factor, it might be expected that the rate of Cali's growth will conform more closely to that of Colombia.

National urban structure is usually examined either by the concept of urban primacy or by the concept of a "normal" urban hierarchy, often termed the "rank-size rule." Both of these are useful in exploring the structure of cities in Colombia, and each will be examined in turn.

Morse summarizes the ways in which urban primacy is usually conceived:

Urban primacy has various definitions. Some refer to national pyramids of cities, ranked by population size, culminating in a primate city which is by one or another criterion abnormally large. Looser definitions emphasize concentrations of functions and services. Interest attaches to the phenomenon because of the suspicion that primate cities may be dysfunctional, parasitic, and symptomatic of underdevelopment (Morse, 1971b: 36).

One of the most cited studies of urban primacy is that of Mehta (1964). In this study his measure of primacy is "the percentage of the population of the four largest cities residing in the largest city of the country" (Mehta, 1964: 141). The study, using circa 1955 data, ranked 87 countries in terms of the primacy of their urban structure. Twenty-one of these countries were in Latin America. Of these 21
countries, Colombia was ranked 21; it had the lowest level of primacy of all the Latin American countries listed (all of the countries in South America were listed, except Guyana, which was not an independent country in 1955). Of the 87 countries included on the total list, Colombia was ranked 80 (Mehta, 1964: 141). Clearly, Colombia is not dominated by one large city, as are so many of the Latin American countries.

Yet Colombia is highly regionalized, and it may be that there is a tendency for regional primacy to exist. Although there are few studies of regional primacy, it seems reasonable that one could combine the already-tested measure of primacy used by Mehta with a recent unpublished regionalization of Colombia (Hollingsworth and Webber, 1968). However, the regionalization devised by Hollingsworth and Webber must be modified to fit the purposes of this study. Their scheme delineated twelve sociocultural regions in Colombia (Costa Atlántica, Los Santanderes, Cundinamarca-Boyacá, Medio Magdalena, Grupo Paisa, Costa Pacífica, Valle, Alto Magdalena, Cauca, Nariño, Llanos, Otros). However, for this study, three of the regions (Medio Magdalena, Costa Pacífica, and Llanos) can be eliminated, because they do not contain one of the largest cities in the country, which are the cities for which adequate data are available. The nine remaining regions are combined into four larger regions, which I term southern Colombia (including Valle, Alto Magdalena, Cauca, and Nariño), the "Paisa" group (including
only the Grupo Paisa), highland Colombia (including Los Santanderes, Cundinamarca-Boyacá, and Otros), and the Atlantic Coast (including only the Costa Atlántica). It should be noted that two of these new regions are the same as the Hollingsworth-Webber regions, and the other two regions appear to have some basis in fact—all of the parts of the southern Colombia region (Valle, Alto Magdalena, Cauca, and Nariño) send sizable numbers of migrants to Cali, while all of the parts of the highland Colombia region (Los Santanderes, Cundinamarca-Boyacá, and Otros) send sizable numbers of migrants to Bogotá. The four largest cities in each of these regions are listed in Table 5. The measure of primacy used in this table is the percentage of the population of the four largest cities residing in the largest city of the region.

The results of Table 5 are somewhat surprising. While the mean level of primacy for the 87 countries in the Mehta study was 59.8, the mean level of primacy for the four "regional cities" in Colombia was 62.0. If the median rather than the mean is used, then the median level of primacy for the 87 countries in the Mehta study was 60.0, while the median level of primacy for the four "regional cities" in Colombia was 59.5. Thus there does not appear to be a high level of regional primacy in Colombia, contrary to what has been suggested: "Colombia is highly regionalized; a city like Medellín might be said to have primacy at the departmental level" (Morse, 1969: 486 [footnote 43]).
TABLE 5
PRIMACY OF URBAN STRUCTURE: FOUR REGIONS
OF COLOMBIA, 1964

<table>
<thead>
<tr>
<th>Region</th>
<th>Four Largest Cities in the Region</th>
<th>Population of Each of the Largest Cities in the Region</th>
<th>Measure of Primacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern Colombia</td>
<td>Cali, Ibagué, Palmira, Pasto</td>
<td>637,929, 163,661, 140,889, 112,876</td>
<td>60.5</td>
</tr>
<tr>
<td>&quot;Paisa&quot; Group</td>
<td>Medellín, Manizales, Pereira, Armenia</td>
<td>772,887, 221,916, 188,365, 137,222</td>
<td>58.5</td>
</tr>
<tr>
<td>Highland Colombia</td>
<td>Bogotá, Bucaramanga, Cúcuta, Barrancabermeja</td>
<td>1,697,311, 229,748, 175,336, 71,096</td>
<td>78.1</td>
</tr>
<tr>
<td>Atlantic Coast</td>
<td>Barranquilla, Cartagena, Montería, Ciénaga</td>
<td>498,301, 242,085, 126,329, 113,143</td>
<td>50.9</td>
</tr>
</tbody>
</table>

* It is interesting that all of the fifteen largest cities in the country are included in this list; Barrancabermeja ranks 27 in size among Colombian cities.

Source: Departamento Administrativo Nacional de Estadística, 1967: Table 6.

Another way to examine national urban structure is by means of the "rank-size rule." This is a theoretical model of the distribution of cities by size, where "the population of each city tends to be in inverse proportion to its rank by order of size . . . the second, third, and fourth largest city might be expected to have one-half, one-third, and one-quarter the population of the largest
city, and so forth" (United Nations Commission for Latin America, 1969: 194). If the actual population of the largest cities in Colombia and the "expected" population of these cities (based on one-half, one-third, one-quarter, etc., the population of the largest city) are compared, as is done in Table 6, it is found that there is a rather good "fit" between the actual and the "expected" population. Thus Colombia conforms rather well to the idea of an urban hierarchy, theoretically indicating that there is a rather well-balanced structure of cities in Colombia, without an

<table>
<thead>
<tr>
<th>City</th>
<th>Actual Population</th>
<th>&quot;Expected&quot; Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bogotá</td>
<td>1,697,311</td>
<td>1,697,311</td>
</tr>
<tr>
<td>Medellín</td>
<td>772,887</td>
<td>848,655</td>
</tr>
<tr>
<td>Cali</td>
<td>637,929</td>
<td>565,770</td>
</tr>
<tr>
<td>Barranquilla</td>
<td>498,301</td>
<td>424,328</td>
</tr>
<tr>
<td>Cartagena</td>
<td>242,085</td>
<td>339,462</td>
</tr>
<tr>
<td>Bucaramanga</td>
<td>229,748</td>
<td>282,885</td>
</tr>
<tr>
<td>Manizales</td>
<td>221,916</td>
<td>242,473</td>
</tr>
<tr>
<td>Pereira</td>
<td>188,365</td>
<td>212,164</td>
</tr>
<tr>
<td>Cúcuta</td>
<td>175,336</td>
<td>188,590</td>
</tr>
<tr>
<td>Ibagué</td>
<td>163,661</td>
<td>169,731</td>
</tr>
</tbody>
</table>

Source: Departamento Administrativo Nacional de Estadística, 1967: Table 6.
overwhelming predominance of just one or two cities, as is so often the case in Latin America.

An interesting theoretical discussion of the rank-size distribution of cities is provided by Vapñarsky, when he examines regions in Argentina for both primacy and rank-size distribution (Vapñarsky, 1969). In this study he insists that regions must be drawn not on the basis of geographic or political boundaries, but on the basis of ecological systems. This has been the intent of the Colombian regionalization presented above. Vapñarsky also observes that "primacy and rank-size rule are not mutually exclusive models" (Vapñarsky, 1969: 584). Thus, as Morse notes, "primacy depends on the level of closure or self-containment of an area (i.e., proportion of interactions beginning and terminating within the system) and rank-size distribution upon the level of internal interdependence or interaction of an area" (Morse, 1971b: 43). Since the rank-size rule appears to apply to all cities in Colombia, while there is a very low level of primacy, the Vapñarsky model would lead us to expect both a high level of closure and high interdependence. Colombia, with its extreme regionalization, undoubtedly does have a high level of closure, whereby most interactions beginning within the region terminate within that region. Interdependence is the interaction that takes place among the units in a region, so that "low interdependence means relative isolation of the units from each other in the area" (Vapñasky, 1969: 585).
While this is not the place to test the level of interaction within the various regions of Colombia, it does appear that there is a high level of regional interaction, at least within the southern Colombia region, with which the author is most familiar. Therefore, Colombia appears to "fit" the Vapăarsky model, to have both high closure and high interdependence, with a rank-size distribution which generally applies to all the cities.

Turning from the structure of cities in Colombia to the level of urbanization, the facts show that Colombia has become an urban rather than a rural nation. In 1938, the first year for which urban-rural data were available, 30.9 per cent of the Colombian population was urban; this rose to 38.9 per cent of the population being classed as urban in 1951. By 1964, the date of the most recent census, 52.8 per cent of the Colombian people were urban, which means that these Colombians were living in places of 1,500 or more inhabitants (Webber, 1973: Table 1).

In Table 7, Colombia is compared with other Latin American nations in terms of per cent urban. As can be seen in the table, Colombia is one of a growing number of Latin American countries which have crossed the threshold from a predominantly rural to a predominantly urban population.


### TABLE 7

**URBANIZATION OF THE LATIN AMERICAN POPULATION**

<table>
<thead>
<tr>
<th>Country</th>
<th>Date of Data</th>
<th>Per Cent Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uruguay</td>
<td>1963</td>
<td>80.8</td>
</tr>
<tr>
<td>Chile</td>
<td>1970</td>
<td>76.0</td>
</tr>
<tr>
<td>Venezuela</td>
<td>1970 (E)</td>
<td>75.7</td>
</tr>
<tr>
<td>Argentina</td>
<td>1970 (E)</td>
<td>74.3</td>
</tr>
<tr>
<td>Cuba</td>
<td>1971 (E)</td>
<td>60.5</td>
</tr>
<tr>
<td>Mexico</td>
<td>1970</td>
<td>58.7</td>
</tr>
<tr>
<td>Brazil</td>
<td>1970</td>
<td>55.9</td>
</tr>
<tr>
<td>Peru</td>
<td>1971 (E)</td>
<td>53.2</td>
</tr>
<tr>
<td>Colombia</td>
<td>1964</td>
<td>52.8</td>
</tr>
<tr>
<td>Panama</td>
<td>1970</td>
<td>47.6</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>1968 (E?)</td>
<td>44.7</td>
</tr>
<tr>
<td>Dominican Republic</td>
<td>1970</td>
<td>39.8</td>
</tr>
<tr>
<td>El Salvador</td>
<td>1971</td>
<td>39.4</td>
</tr>
<tr>
<td>Ecuador</td>
<td>1970 (E?)</td>
<td>38.3</td>
</tr>
<tr>
<td>Paraguay</td>
<td>1970 (E?)</td>
<td>35.7</td>
</tr>
<tr>
<td>Bolivia</td>
<td>1970 (E)</td>
<td>35.0</td>
</tr>
<tr>
<td>Costa Rica</td>
<td>1963</td>
<td>34.5</td>
</tr>
<tr>
<td>Guatemala</td>
<td>1964</td>
<td>33.6</td>
</tr>
<tr>
<td>Honduras</td>
<td>1969 (E?)</td>
<td>32.2</td>
</tr>
<tr>
<td>Guyana</td>
<td>1970 (E)</td>
<td>29.5</td>
</tr>
<tr>
<td>Haiti</td>
<td>1970 (E)</td>
<td>16.2</td>
</tr>
<tr>
<td>Trinidad and Tobago</td>
<td>1970</td>
<td>12.4</td>
</tr>
</tbody>
</table>

_E_ = estimate  
_E?_ = estimate of questionable reliability

Source for all except Argentina, Bolivia, Haiti: United Nations, 1972: Table 5.  

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**Growing Industrialism -- The Economic Base of the City**

Prior to the twentieth century Cali was a small, rather plebeian town whose economy was based almost entirely upon agriculture, and especially upon the raising of cattle. Other activities which were beginning to center in Cali were
the tobacco and sugar interests. Tobacco made its presence felt in the city before the middle of the nineteenth century, and the sugar industry began shortly thereafter.

In 1864 . . . the first major enterprise in commercial agriculture was initiated in Valle: the planting of a relatively large hacienda in sugar cane and the installation of steam-powered sugar mill by a Russian-American immigrant to Colombia, James Eder. His successful example was followed by the Caicedo sugar mill in the early 1900's, and later by others (Posada and Posada, 1966: 52).

There were also a few other small commercial ventures which dealt with the Cauca Valley area, as the smaller cities in the region were beginning to look to Cali for commercial leadership.

In 1915, the city of Cali was linked with the Pacific port of Buenaventura by the railroad. With the opening of the Panama Canal at nearly the same time, the city had an outlet to the rest of the world. Suddenly there was a market for the produce of the Cauca Valley, and as the transportation network in the Cauca Valley steadily improved, Cali became the hub for the accumulation and shipment of this produce, and the center for the concentration of the wealth that was derived from these activities. This stimulated the beginnings of industrial expansion, from about 1925 to 1930. While the worldwide depression subsequently slowed industrial growth, after 1930 "several types of government investment took place, especially in transportation, communications, and electric energy facilities, which generated industrial activity" (Dow, 1971: 32-33).
At the same time in the early 1930s, "because of protection to agriculture . . ., agricultural production gained impetus" (Posada and Posada, 1966: 52).

The Second World War and its aftermath led to a boom in manufacturing production, and "For the first time large industrial establishments and the consequent large-scale production started to replace the smaller establishments" (Dow, 1971: 33). Foreign capital, which had flowed into Colombia during the 1925-1930 period, but had been severely curtailed during the depression (Lipman, 1969: 26), again began to pour into Colombia.

In the most recent decades, agriculture in the Cauca Valley region has advanced rapidly. One of the world's most efficient and modern sugar factories, La Manuelita, is located in the municipio of Palmira, near Cali. The widespread use of tractors is most prevalent in the department of El Valle del Cauca, whose rich, productive and level lands, after 400 years of use in a very rudimentary pastoral culture, rapidly are being transformed into sugar-cane, rice, and cotton plantations. . . . it is here that the mechanized system of agriculture is making the most headway (Smith, 1967: 233).

Thus the years after World War II in Colombia were marked by both industrial growth and the rapid expansion of large-scale commercial agriculture in the Valle region. It is the growth in both of these vital sectors of the economy that made the rapid growth of the city of Cali possible. Yet at the same time this agricultural "modernization"
hardly touched a large part of the agricultural potential, so that much of the rural area is still rather backward.

The result is that agriculture in the Cauca Valley today is unevenly developed, and the contrasts are stark. It is highly mechanized and productive for a small group of large owner-operator and tenant-operator wealthy farmers; it is extremely backward, even primitive for the vast majority of the owners of small and medium-sized farms, located especially in the hills (Posada and Posada, 1966: 52).

One of the most important factors that is presently at work in the Cauca Valley stimulating agricultural development and also greatly aiding industrial growth is the Autonomous Regional Corporation of the Cauca Valley (CVC). Rather like the Tennessee Valley Authority (TVA) in the United States, this decentralized, administratively autonomous agency was established in 1954 "for the purpose of promoting the unified development of the natural resources of the Upper Cauca River Valley in Colombia" (Posada and Posada, 1966: 11). The specific goals of the CVC are to render "a series of public services, such as generation, transmission, and distribution of electric power; the promotion of agricultural and industrial enterprise; and cooperation in the development of programs in education, public health, and community action" (Posada and Posada, 1966: 63). By the late 1960s, the CVC had had success with three programs: "(a) Supplying electric power for the entire region, as a result of which its industrial development has obviously increased; (b) land reclamation (flood control, irrigation, and drainage), and (c) raising the standard of
living of the rural population by disseminating modern and improved methods of production" (Posada and Posada, 1966: 97).

Perhaps the most crucial project for the growth of industry in Cali is the supply of energy. Indeed, one of the most useful indicators of modernization is per-capita energy consumption. "Even though the surprising industrial development of Valle during the past two decades [1945-1965] cannot be attributed to electricity alone, it is evident that the supply of a greater volume of electric power has been an element basic to this development" (Posada and Posada, 1966: 106). One study noted that between 1956 and 1958 electrical production increased from 77,569,000 to 83,157,000 kilowatt hours (Pendleton, 1965: 44). Another study reported that

the electric power potential of Valle is excellent and relatively easy to harness. The total installed capacity of the Cauca Valley region in 1955 was 75,000 kilowatts, of which 49,200 was from hydro sources and 25,900 thermal. But the rapid expansion of population and industrialization led to an estimate made in 1955 of an increase in demand for power of 150,000 kilowatts by 1965. However, these estimates of demand have been periodically revised upward as the progressively increasing population growth rate invalidates previous estimates in demand (Posada and Posada, 1966: 46).

While more recent estimates of energy demand are not available, it is apparent that the demand has been rapidly growing. Now under construction in the Valle region by a Mexican construction company is "one of the largest dams in South America. When it's finished, it will supply power for the 900,000 residents of Cali, and most of the other people

The industrial establishments that already exist in Cali are impressive, giving credence to Cali's claim to being an "industrializing" city. One mid-1960s study claims that there are in Cali "80 large factories ranging in production from textiles to cement. . . . [and] approximately 32 per cent of the working population . . . [is] engaged in production" (Pendleton, 1965: 44). Yet much of this industrial establishment is controlled by outsiders. In 1956 Hagen found that of 44 large industrial firms in Valle, 17 were founded by Antioqueños, 9 by persons of foreign origin, 8 by Vallecaucanos, 7 as branches of foreign firms, and the remainder by other Colombians (Hagen, 1962: 64).

Foreign control of manufacturing, especially North American, is large. A leading figure associated with the local association of manufacturers estimates that 40 per cent of local manufacturing is foreign-owned, and even this estimate may be low. Among the companies represented are: Alcan, Colgate-Palmolive, Gillette, Goodyear, Grace, Home Products, Quaker Oats and Squibb. The French, Germans, Swiss and Swedes have also made investments in Cali. The Lebanese have been active in the textile industry and some have remained as permanent residents. Since World War II, there also has been a large immigration of Central Europeans, particularly Germans, into small business, including trade, optics, baking, hotels, and other services (Blasier, 1966: 397).

Within Colombia, Cali ranks third as an industrial center behind Bogotá and Medellín. A departmental breakdown in 1959 showed that Cundinamarca (and principally the city of Bogotá) had 28.9 per cent of the total factory employment in Colombia, Antioquia (and principally the city of Medellín)
had 24.9 per cent, Valle del Cauca (and principally the city of Cali) had 16.1 per cent, Atlántico (and principally the city of Barranquilla) had 10.0 per cent, and all other departments had 20.1 per cent of the total factory employment in Colombia (Dix, 1967: 23). By 1964, there is some evidence that Cali's industrialization had grown in relation to Bogotá and Medellín. Table 8 shows this evidence, in the form of the economically active population by departments engaged in industrial activity (Industrias de Transformación). Though they are not precisely comparable, if one compares the Dix figures for 1959 with the 1964 census figures (column d), it appears that Cali's industrial establishment is increasing with respect to the industrial establishments of Bogotá and Medellín. Thus Cali is clearly an industrial city, and is assuming greater importance as an industrial center in Colombia. Surely the ecology of the city will be affected by the importance of this activity.

Topography and Transportation

Colombia is divided by the western, central, and eastern ranges of the Andes Mountains. Between the western and the central ranges is the Cauca River Valley, and

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3Unfortunately departmental rather than city data must be used; city data are not available.

4These figures must be used with caution, as Industrias de Transformación may include people employed in home craft shops, as well as factories.
### Table 8

**Economically Active Population Engaged in Industrial Activity, by Departments, 1964**

<table>
<thead>
<tr>
<th>Department</th>
<th>Economically Active Population (a)</th>
<th>Economically Active Population Engaged in Industrial Activity (b)</th>
<th>Per Cent of (b) in (a) (c)</th>
<th>(b) as a Per Cent of the Colombia Total of (b) (d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bogotá, D.E. and Cundinamarca*</td>
<td>910,068</td>
<td>154,344</td>
<td>17.0</td>
<td>23.5</td>
</tr>
<tr>
<td>Antioquia</td>
<td>658,845</td>
<td>100,789</td>
<td>15.3</td>
<td>15.4</td>
</tr>
<tr>
<td>Valle del Cauca</td>
<td>529,544</td>
<td>100,336</td>
<td>18.9</td>
<td>15.3</td>
</tr>
<tr>
<td>Atlántico</td>
<td>193,287</td>
<td>45,818</td>
<td>23.7</td>
<td>7.0</td>
</tr>
<tr>
<td>Rest of Colombia</td>
<td>2,842,381</td>
<td>254,674</td>
<td>9.0</td>
<td>38.8</td>
</tr>
<tr>
<td>Colombia Total</td>
<td>5,134,125</td>
<td>655,961</td>
<td>12.8</td>
<td>(100.0)</td>
</tr>
</tbody>
</table>

*These two are combined so that they will be comparable to the Dix figures presented above.

Source: Departamento Administrativo Nacional de Estadística, 1967: Table 34.

between the central and eastern ranges lies the Magdalena River Valley. Cali is located at the bottom of the eastern slope of the western range of the Andes at an elevation of 3,200 feet, and just three degrees north of the Equator. To the north, east, and south of Cali is the broad and extremely fertile Cauca River Valley. Because its flat valley plain is so big, stretching for more than a hundred miles, and with a breadth at times reaching twenty miles, it
is capable of supporting a very large population, much larger than the 82 inhabitants per square kilometer who inhabited the department of Valle del Cauca in 1964.

Most of the city lies on the flat plain of the Cauca Valley, though some barrios climb into the foothills, and are located on steep terrain. In the field survey of Cali barrios, it was found that 78 per cent of the barrios were located on level terrain, 8 per cent were on gently sloping terrain, and 14 per cent were on steep slopes, ridges, or hilly terrain. Recent growth has generally extended the city further outward into the valley, rather than higher up the mountainsides. The Cali River flows through the city roughly from west to east, and is perhaps the most dominant line of demarcation within the city, often serving as a dividing line between "better" and "poorer" residential areas before it joins the Cauca River at the edge of the city. Except for the barrios rising into the foothills, the topography generally is not a constraining factor on the areal distribution of activities in Cali.

The bus is the primary method of transportation for the vast majority of the people, except for the more affluent Caleños who possess automobiles or make extensive use of taxis. Busses run into virtually all areas of the city, except for a few of the barrios rising up steep hillsides, and are a relatively cheap method of transportation. As in most growing cities, the busses are generally extremely crowded, though somehow they manage to accommodate those who must use them.
The street system of Cali has lagged considerably behind the rapid population growth of the city. While the main streets in all areas are generally paved, and most streets in the older areas of the city are paved, the field survey shows that fully two-thirds of all the barrios in the city have mostly dirt streets. These streets are terribly dusty during dry seasons, in places become impassable during wet seasons, and are a source of great annoyance and despair to the housewives in these areas.

Connecting the city with the outside world is a new and spacious jet airport, and a modern railway station. The road south from Cali to Popayán is new and modern, cutting what used to be an arduous trip to a mere few hours. The highway north from Cali linking it with Palmira, Buga, Cartago, Tuluá and other towns in the Cauca Valley is good. Beyond the Cauca Valley the highway system is not nearly as good, because the rugged mountainous terrain makes road construction a monumental task. The road from Cali to Bogotá is still difficult, and the 88-mile road from Cali to the Pacific port of Buenaventura, while filled with spectacular vistas and passages through several small waterfalls, is fairly rugged. Yet this all-weather road to Buenaventura does handle the constant stream of trucks that link Cali to the Pacific Ocean. Aside from these main roads, paved highways are virtually absent.
Class Structure

Examining the stratification system in Cali is at best a difficult task, because "comparatively little is known about the social stratification and class structure of Colombian society" (Smith, 1967: 328). The procedure which is adopted here is to show the percentage of the population of Cali which resides in the various classifications of the barrios delineated by socioeconomic status. As explained in the previous chapter, "one" designated a barrio as upper class, "two" as middle class, "three" as lower middle class, "four" as working class, "five" as working lower class, and "six" as impoverished lower class. A class breakdown given in this manner is not without precedent, as a recent study of the middle class in Cali employed an areal definition of the middle class "because residence is generally closely associated with ecological position as well as general social characteristics" (Pendleton, 1965: 47). Yet an areal breakdown of class is somewhat misleading, because even though the barrios are relatively homogeneous in their social characteristics, it is nonetheless clear that there are varieties of social position within each barrio that cannot be accounted for with this approach. To be sure, many of these differences will cancel each other out, but one cannot know to what extent this "cancelling out" will occur. Another well-taken objection to such a procedure is raised by Smith, who states that "the Colombians I know who
reside in what would be judged to be middle-class residential districts, in homes that our sociological scales would identify as dwellings of those of the middle class, are the descendants of those who were unchallenged members of the upper class" (Smith, 1967: 342). Bearing these objections in mind, Table 9, which shows an areal breakdown of social class in Cali in 1964, is presented. This table shows that only about two per cent of the population of Cali belonged to the upper class in 1964, and about fifteen per cent belonged to the middle classes. The remainder were either working class or lower class. This preponderance of the people in the lower classes is not

TABLE 9
SOCIAL STRATIFICATION IN CALI, 1964

<table>
<thead>
<tr>
<th>Barrio</th>
<th>Class</th>
<th>Per Cent of Cali Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Upper</td>
<td>2.1</td>
</tr>
<tr>
<td>2</td>
<td>Middle</td>
<td>6.5</td>
</tr>
<tr>
<td>3</td>
<td>Lower Middle</td>
<td>8.6</td>
</tr>
<tr>
<td>4</td>
<td>Working</td>
<td>14.8</td>
</tr>
<tr>
<td>5</td>
<td>Working Lower</td>
<td>53.0</td>
</tr>
<tr>
<td>6</td>
<td>Impoverished Lower</td>
<td>13.1</td>
</tr>
<tr>
<td>Other*</td>
<td>---</td>
<td>1.2</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Other barrios refer to rural agricultural barrios and specialized barrios, which often contain institutional groups, such as the jail, mental hospital, military barracks, etc.

unusual for a city in Latin America, especially a city which has had so much of its population growth recently. Whether the middle classes are growing cannot be ascertained by this table, although at least one observer believes these classes are growing in Cali. "The growth of trade and commerce, the construction of new public and parochial schools, and expanding public employment have contributed to a sharp increase in the ranks of the middle class" (Blasier, 1966: 395).

One important component of social class position is income. A recent study examined the income distribution in Cali in 1965, and found that only ten per cent of Cali's employed workers received 54.8 per cent of individual income, while the lowest eighty per cent of the employed workers received only 32.5 per cent of individual income (Nelson, Schultz, and Slighton, 1971: 143). Because the per capita income for Colombia in 1970 was only about three hundred dollars, it is clear that the working and lower classes have meager financial resources. While these income data are not directly comparable with the data presented in Table 9 above, it is readily apparent that there is a large proportion of the population in the lower classes, and a relatively small proportion of the population in the middle and upper classes. By all indicators, Cali is a city of predominantly lower and working-class people.
The Image of the City

While it is undoubtedly important to examine various social indicators, such as population growth, class structure, economic data, and historical precedents to begin to understand the dynamics of the city, it is also useful to try to understand how the city's inhabitants feel about their city, and the impressions they hold. The sum total of these various impressions is referred to as the "image" of the city. This image can be ascertained by having a respondent draw maps of the city, or describe the most important or memorable parts of the city, or asking him to make value judgments about key aspects of the city.

Armando Velasco, a faculty member at Cali's Universidad del Valle, has over a period of several years had his architecture students interview nearly two hundred fairly-well-educated Cali residents. These residents were asked to give either a brief description or a sketch of the city of Cali indicating those things that, in their opinion, stood out most clearly for a person not very familiar with the city. The three most important aspects that were indicated by these residents were the bull ring, the Plaza Caicedo (the main plaza, the center of the city), and the "Olympic Village" (a sports complex containing the soccer stadium, a coliseum, and a huge swimming pool). These predominant images confirm that Cali is a city of great sports enthusiasts, supporting two professional soccer teams, Cali
and América, both of which generally field strong teams challenging for the Colombian championship. Other aspects of the city which the respondents felt were important were "La Ermita" church, Avenida Colombia, the railroad station, the Cali River, the hill with three crosses overlooking the city, the hill with a huge cement statue of Christ overlooking the city, and the park surrounding the water reservoir (Velasco, 1967: 51-54). The city is, for the residents, a mosaic of elements which are not clearly tied together.  

In his review of studies of the spatial structure of Latin American cities, Schnore notes that vital information concerning population growth rates, topography, transportation, class structure, and the economic base of the city is often missing (Schnore, 1965: 362-364). In this chapter, information pertaining to these subjects has been presented at some length, in the hope that this information will enlighten the examination of the ecological structure of the city of Cali which follows in the next chapter.

5"Es decir, la ciudad no es para ellos un conjunto articulado de edificios, barrios, vías, áreas industriales y límites naturales, sino un mosaico de elementos sin vinculaciones muy claras entre sí" (Velasco, 1967: 53).
Chapter V

THE ECOLOGY OF CALI

In this chapter, the structure of the city of Cali is examined, using the areal unit of the barrio as the basic unit of analysis. The intent of this examination is not to describe the interaction of individuals within neighborhoods, or barrios, but to describe the way these barrios, as larger indicators of individual differences, comprise the structure of the city of Cali. The independent variables that will be assessed to determine the effect that they have on the structure of the city are land use, recent growth, population density, socioeconomic status, and transportation.

Land Use

The field survey of Cali ascertained the percentage of developed land in each of the barrios devoted to residential, commercial, and industrial functions. Specialized and rural-agricultural barrios were not included in this percentage breakdown, but are presented as separate categories. During the field survey, the assignment of percentages of land use for each function (residential,
commercial, industrial) in the barrio was made on the basis of field observation and subsequent estimates by the author. While the field schedule for each barrio listed percentage categories for each function (50-100%, 10-50%, 2-10%, Very Slight), the author has written in specific estimated percentages (5%, 10%, 15%, 20%, 25%, 30%, 40%, 50%, etc.) wherever the barrio had more than the residential function; i.e., wherever there was commercial and/or industrial activity, as well as residential. (See chapter 3 for an examination of the field schedule.)

Figure 1 shows the barrios of the city of Cali. In this figure, and future figures, the barrios are numbered, with the numbers denoting the same barrio in all figures. In the discussion of the material presented in the figures, barrios are referred to by number rather than by name, for the sake of simplicity of discussion and clarity of figure presentation. The names of the numbered barrios (some of the barrios have several names and some share the same name) are listed in Table 11, near the end of the land-use section of this chapter. In figure 1, the solid heavy lines denote major arterial highways, and the Cali River, which is designated (Rio Cali) in the figure. These highways and the river are included in all the figures, as an aid to understanding.

Figures 2 and 3 show the land usage of Cali barrios. Two figures of land usage have been prepared because "industrial" barrios generally contain some commercial
SEE TABLE 2 FOR THE NAMES OF THE NUMBERED BARRIOS ON THIS AND SUBSEQUENT MAPS
functions, and the use of a single figure would have made it difficult to portray the complexity of these relationships. In addition, the use of a second land-use figure permits greater detail through the presentation of various levels of commercial activity.

Figure 2 shows rural-agricultural, specialized, commercial, and residential barrios; and industrial barrios, divided into those barrios with more than forty per cent of their developed land devoted to industry, and those barrios with ten to twenty per cent of their developed land devoted to industry. (None of the barrios was rated as having thirty per cent of its developed land devoted to industry.) Residential barrios are those which have seventy per cent or more of their developed land devoted to residents, either single-family or multiple-family dwelling units, and do not contain ten per cent or more industrial activity. However, it is critical to note that in the discussion of variables other than land usage in subsequent sections of this chapter (recent growth, density, socioeconomic status, family status, and transportation), all barrios will be treated as "residential," because in all of the one hundred and thirty-one barrios studied (all barrios except rural-agricultural and specialized barrios) there was a substantial residential population.

Figure 3 shows the level of commercial land usage in Cali barrios in 1968. In figure 3 and most subsequent figures rural-agricultural and specialized barrios are not
COMMERCIAL LAND USE IN CALI BARRIOS - 1968

FIGURE 3

COMMERCIAL ACTIVITY
- NEGLIGIBLE
- 5% - 15%
- 20%
- 30%
- 40% OR MORE
- UNACCOUNTED AREA
discussed; only the remaining one hundred and thirty-one residential barrios are examined.

Examination of figure 2 shows that rural-agricultural barrios tend to be near the periphery, and are clustered primarily in the southern and western parts of the city. It is apparent, however, that residential barrios do not always grow outward from the center of the city (which in this study is defined as the geographical center of barrio 8), filling up vacant (i.e., generally "rural-agricultural") land as they spread. Rather these residential barrios often jump over rural-agricultural land, and develop areas somewhat detached from the built-up portions of the city. Thus city barrios are often surrounded by vacant land waiting to be filled in by future growth. Rural-agricultural barrios are prime candidates for this future growth, and recent discussions by the author with several students who have visited Cali in 1973 indicate that at least nine of the fourteen rural-agricultural barrios (44, 61, 76, 90, 93, 100, 128, 131, 156) have experienced substantial residential development within the past few years. Those five rural-agricultural barrios (119, 126, 127, 133, 140) which do not appear to have experienced substantial recent growth are all on the western (mountainous) edge of the city, giving support to the contention in the previous chapter that most of the city's growth was outward on the flat plains of the Cauca River Valley rather than climbing up the steep mountainside on the western edge of the city.
Specialized barrios, as might be expected, do not exhibit any particular pattern, being scattered throughout the city. There is, however, a notable absence of specialized barrios within the main commercial area and the industrial area of the city. Although land value data are not available, this undoubtedly reflects the relatively high cost of location within the industrial and commercial areas, and the relatively extensive amounts of land required by most of the specialized barrios, such as the air base, the water works, the army base, the municipal park, the horse-racing track, and the country club.

Industrial barrios occupy a very distinct area, spreading out east of the commercial center of the city. With only one exception (barrio 36), all of the barrios with ten per cent or more of their developed land devoted to industry are in this area. Separating this industrial activity from the middle-class and upper-class residential areas to the north is the Cali River. While this river is neither wide nor navigable, it does form a distinct line of demarcation. The industrial area, while containing substantial residential areas interspersed throughout it, stretches to the open lands near the eastern boundary of the city, where some future industrial development will undoubtedly occur. Bifurcating the southeastern part of the industrial area is the air base. While industrial activity is beginning to grow around this large specialized activity, the author heard persistent rumors from local residents
during the field survey that the base would eventually be closed and the land turned over to industrial activity. It proved impossible to confirm these rumors. The southern edge of the industrial area has no obvious line of demarcation; it blends into the working-class residential barrios which are prevalent in that part of the city. Just outside the boundaries of Cali, in the municipio of Yumbo, northeast of the center of the city, is another cluster of industrial activity. While this area is not included in the study of the ecology of Cali, it is interesting that this industrial area developed in a location that makes it almost an extension of the industrial area of Cali. Informants during the field survey claimed that industry developed in this area out of a desire for the lower tax rates of Yumbo.

The one "industrial" barrio (barrio 36) which is outside the industrial area is located north of the commercial center of the city, in an upper-class residential area. The industries in this area are in modern, aesthetically-pleasing buildings, and are extensively landscaped. There are no heavy industries, although there is an electric-generating plant. The main plants are Coca-Cola of Colombia, Carvajal and Company (a large printing and office-supply concern), Editorial Norma (a printing concern), and several pharmaceutical companies, such as Merck, Sharp, and Dohme. None of these industries requires substantial numbers of blue-collar workers.
Table 10 lists the percentage of developed land for each of the industrial barrios estimated in the field survey to be devoted to industrial activity. Interestingly, the two barrios which the field survey determined had the highest level of industrial activity are two of the three barrios which are named "industrial." Barrio 62 is called "Industrial" and barrio 46 is called "Zona Industrial." One other barrio, barrio 60, also used the word industrial, being called either "Flora Industrial" or "Calima."

**TABLE 10**

**INDUSTRIAL BARRIOS IN CALI, 1968**

<table>
<thead>
<tr>
<th>Barrio</th>
<th>Per Cent Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>80</td>
</tr>
<tr>
<td>46</td>
<td>70</td>
</tr>
<tr>
<td>45</td>
<td>60</td>
</tr>
<tr>
<td>48, 54, 60</td>
<td>50</td>
</tr>
<tr>
<td>49, 51</td>
<td>40</td>
</tr>
<tr>
<td>50, 52, 55, 59, 63, 74, 83</td>
<td>20</td>
</tr>
<tr>
<td>15, 16, 17, 22, 36, 57</td>
<td>10</td>
</tr>
</tbody>
</table>

The other land uses shown in figure 2 are residence and commerce. Residence will be discussed in subsequent sections of this chapter, and will not be treated here. Commerce will be discussed through an assessment of figure 3.

Turning to figure 3 one finds that the areal distribution of commercial activity presents a more complex pattern than does industrial activity. The highest mapped level of commercial activity, forty per cent or more, is found in the heart of the city. This activity is centered
in barrio 8, which comprises what the residents of the city would call the "downtown" area. This "downtown" area surrounds the Plaza de Cayzedo, which is the original central plaza of the colonial city of Cali. This plaza is one of the key elements in the residents' image of the city. A high level of commercial activity lies to the east of barrio 8, in barrios 13 and 14. These barrios form a link between the central commercial area and the industrial area and have a good deal of industry-supporting commerce. To the south of barrio 8, in barrios 9, 10, 11, and 12 is the remainder of the area of intensive commercial activity of Cali. This is an old part of the city, and the commercial uses of the area are as varied as the imagination can conceive, though there are few "upper-class" commercial activities, such as fine shops, in this area. Generally, this is the commercial area that supports the working-class people of Cali.

Separating the commercial center of the city from the upper-class and middle-class barrios which lie to the north is the Cali River. That commerce which has crossed the river from the commercial center to these well-to-do areas is generally geared to more affluent patrons. Here, in barrios 34, 35, 36 and 37, one finds many of the finer shops in the city, and the newer and more modern commercial ventures, such as a small shopping center that is built around a Sears department store in barrio 37. Also in barrio 37 is the social security hospital, and there are several good private clinics in this and surrounding barrios.
To the east of the commercial center of the city, roughly equalling the industrial area, is a wide dispersion of commercial activities. Many of these activities are geared to the support of industry and of the workers who must pass through the area during their journeys to and from work. This area is also somewhat older than the extensive working-class areas to the south, which have perhaps not yet been in existence for a sufficient length of time for significant levels of commerce to have developed.

To the west of the city center is some commerce which stretches from the commercial center along several of the main streets, especially Calle Quince and Avenida Roosevelt. This commerce is geared to the support of the middle-class and lower-middle-class barrios in the area. Many private schools and other facilities, such as the university hospital, the Universidad del Valle, and the "Olympic Village" sports complex are located in this part of the city. (After the field survey was completed, some of the Universidad del Valle was moved to a new location in barrio 131 in the southern part of the city, where there was more room for expansion.)

Two areas which are not explained by any of the above discussions of commercial activity are barrio 81 on the southeastern edge of the city and barrios 134, 136, and 138 on the western edge of the city. All of these barrios have several things in common--they are small barrios which are somewhat older than the huge lower-class and working-class
barrios which are next to them, and they are located at some distance from the center of the city. Because of large population concentrations (more than thirty thousand people in the immediate vicinity of both barrio 81 and barrios 134, 136, and 138) and distance from central city commerce, it is apparent that some commerce has developed to service the day-to-day needs of these people. More specialized needs are still filled in the commercial center. Indeed, it is somewhat surprising that more extensive commercial activities have not yet developed in these areas. Perhaps the recency of so much of the growth has not allowed for commercial development and thus the smaller, somewhat older barrios have supplied what commercial activity can be found in the area. If this is the case, then we may be seeing the beginning of two new commercial centers of activity. Yet, for all the population growth in these areas, commercial activity remains low.

An assessment of commercial activity throughout the city shows that, in relation to population growth, most commercial expansion appears to have taken place in middle-class and upper-class residential areas, such as those to the north of the commercial center, and along main traffic arteries to the west of the center. Relatively little commercial expansion seems to have occurred within the burgeoning lower-class and working-class residential areas. This finding is in accord with Amato's study of elite residential barrios of Bogotá, where he showed that "new
commercial area construction is observed to have moved in the direction of the higher and middle socioeconomic group" (Amato, 1968: 217). Cali conforms to this pattern.

One of the most difficult aspects of the examination of land-use patterns in a city is the attempt to determine the proportion of the city occupied by each activity. This is very useful knowledge, because it can be used to compare the city in question with other cities for which data are available and thus help to determine the levels of city development and functional specialization.

Very little is known about proportions of various land uses in Latin American cities, although there is a good deal of information about cities in the United States (Niedercorn and Hearle, 1964: 105-110), which can be used for comparison with Cali. In this study a procedure has been devised which will allow the estimation of the proportion of the developed land of Cali devoted to commercial, industrial, residential, and public activities. It should be stressed that these are probably somewhat crude estimates. For each barrio, the percentage of land devoted to specific activities was estimated during the field survey. These estimates are presented in Table 11, where R refers to residential activity, C to commercial activity, RA to a rural-agricultural barrio, I to industrial activity, and S to a specialized barrio. A letter followed by a number refers to the percentage of the developed land in the barrio devoted to that activity. (Thus R90 C10 means that ninety
per cent of the barrio is residential while ten per cent is commercial.) If a letter is given without a following number, this means that one hundred per cent of the developed land in the barrio is devoted to that activity. The percentage for each activity for each barrio is then multiplied by the amount of developed land in the barrio to determine the developed land devoted to each activity. The land devoted to each activity in all the barrios is then totaled, and divided by the total developed land in the city to determine the percentage of developed land devoted to each activity. For public activity, land devoted to specialized barrios will be used. However, it is recognized that some land in other-than-specialized barrios is devoted to public use, for such purposes as schools, public buildings, and plazas. Based on the observations made during the field survey, it is estimated that five per cent of the total developed land area of Cali is devoted to these purposes. One additional public use, roads and highways, accounts for a significant proportion of the developed land in a city. For Cali, it is estimated that twenty per cent of the developed land of the city is devoted to such purposes. Land data are taken from a mimeographed compilation of the Cali Municipal Planning Office, "Distribución de la Población Por Barrios, Areas y Densidades - N° Edificios y Manzanas - 1964" (no date). In a few instances, missing data were estimated by the author. Names and numbers of the barrios are given, as well as the socioeconomic classifications
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<td>1</td>
</tr>
<tr>
<td>144 San Fernando Viejo</td>
<td>R90 C10</td>
<td>2</td>
</tr>
<tr>
<td>145 Miraflores</td>
<td>R90 C10</td>
<td>2</td>
</tr>
<tr>
<td>146 San Fernando Nuevo</td>
<td>R90 C10</td>
<td>2</td>
</tr>
<tr>
<td>147 3 de Julio</td>
<td>R80 C20</td>
<td>3</td>
</tr>
<tr>
<td>148 El Cedro</td>
<td>R80 C20</td>
<td>3</td>
</tr>
<tr>
<td>149 Champagnat</td>
<td>R90 C10</td>
<td>3</td>
</tr>
<tr>
<td>150 Hipódromo</td>
<td>S</td>
<td>-</td>
</tr>
<tr>
<td>151 Eucarístico</td>
<td>R</td>
<td>3</td>
</tr>
<tr>
<td>152 Colseguros</td>
<td>R90 C10</td>
<td>3</td>
</tr>
<tr>
<td>153 El Lido</td>
<td>R</td>
<td>2</td>
</tr>
<tr>
<td>154 Nueva Granada</td>
<td>R</td>
<td>3</td>
</tr>
<tr>
<td>155 Tequendama</td>
<td>R</td>
<td>2</td>
</tr>
<tr>
<td>156 Sin Urbanizar</td>
<td>RA</td>
<td>-</td>
</tr>
<tr>
<td>157 Unidad Venezolana</td>
<td>R</td>
<td>4</td>
</tr>
</tbody>
</table>

of the barrios, based on the field survey of housing, under the heading SES. These data, which will be examined later in this chapter, are included here in the interest of parsimony of data presentation.

The percentage of developed land devoted to each activity is presented in Table 12.

TABLE 12

PERCENTAGE OF DEVELOPED LAND DEVOTED TO VARIOUS USES, CALI, 1968

<table>
<thead>
<tr>
<th>Type of Use</th>
<th>Percentage of Developed Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial</td>
<td>6.2</td>
</tr>
<tr>
<td>Commercial</td>
<td>6.1</td>
</tr>
<tr>
<td>Public (Specialized Barrios)</td>
<td>16.4</td>
</tr>
<tr>
<td>Other Public</td>
<td>5.0</td>
</tr>
<tr>
<td>Roads and Highways</td>
<td>20.0</td>
</tr>
<tr>
<td>Residential</td>
<td>46.3</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Comparison of these data with land-use data for large cities in the United States gives interesting results. In a study of land-use trends in forty-eight large United States cities, (thirty-five of the forty largest cities in the United States were included in this study), it was found that 39.0 per cent of the developed land was devoted to residential activity, 10.9 per cent to industrial activity, 4.8 per cent to commercial activity, 25.7 per cent to roads and highways, and 19.7 per cent to other public activities (Niedercorn and Hearle, 1964: 106). In industrial activity, Cali clearly has not yet reached an industrial level obtained by the average large United States city. Yet Cali has reached sixty per cent of that level, and these land-use data thus appear to confirm the thesis that Cali is well on the way to becoming an industrial city. In comparing levels of commercial activity, cities in the United States have less developed land (4.8 per cent) devoted to that activity than does Cali (6.1 per cent). This is apparently due to the large-scale consolidation of much commercial activity in the United States, with relatively few small family businesses. In Cali, on the other hand, there is a very large number of small neighborhood establishments, leading one to suspect that the higher amount of developed land devoted to commercial activity in Cali is a result of the less-intensive nature of the commercial process. As industrialization proceeds to consume a larger share of the developed land of the city, land devoted to commercial activity is likely to
decline, because an increasing percentage of the commercial goods will be mass-produced and sold in larger, more intensive retail establishments, and a decreasing proportion of the goods will be produced and retailed by small "home" establishments -- i.e., one "bread factory" can probably supply more households with bread than perhaps a hundred home bakeries.

If the public land in specialized barrios in Cali is combined with the "other public" category, Cali has 21.4 per cent of its developed land in public activity. This is nearly the same as the 19.7 per cent in public activities in cities in the United States. These cities in the United States have 25.7 per cent of their developed land in roads and highways, while Cali is estimated by the author to have 20.0 per cent of its developed lands in roads and highways. The remainder of the developed land in Cali, 46.3 per cent, is devoted to residential purposes. For the cities in the United States, 39.0 per cent of the developed land was devoted to this activity. The difference may be attributable to the large proportion of suburban residences in the United States. Virtually all the people in Cali live within the city boundaries; there is almost no suburbanization of residences.

To summarize the discussion of land-use patterns in Cali, it is clear that there is a good deal of functional specialization in land use. Witness the clear and distinct central commercial area, and the rather clearly-defined
industrial area. Obviously there is not a "low incidence of functional differentiation" in land-use patterns, as Sjoberg, has posited for the preindustrial city (Sjoberg, 1960: 96). At the same time, we see in Cali some very modern commercial functions, such as small shopping centers and such large retailers as Sears, alongside much more traditional commercial ventures, such as sidewalk vendors and retail activities in the front room of a family's residence. In commercial activities in Cali, we see "the transition between the most primitive form of marketing and the most modern" (Hoyt, 1963: 451). Overall, Cali appears to have passed well beyond the land-use level of a preindustrial city, and to be approaching land-use levels of industrial cities.

**Barrio Development: The Physical Growth of the City**

The growth of the barrios of Cali is shown in figure 4. In 1797, the city consisted of just four barrios in the area that today is the commercial center of the city (Arboleda, III, 1956: 154). By 1880, the slow rate of population growth had brought settlement to parts of just four more barrios, and by 1930 there was settlement in fourteen additional barrios. Data for 1880 and 1930 were taken from maps in the Cali Municipal Planning Office. By 1951, the city evidenced substantial growth, with forty-five new barrios having been added since 1930. Data for the 1930-1951 period were taken from an undated mimeographed
THE GROWTH OF THE BARRIOS OF CALI

FIGURE 4
compilation of the Cali Municipal Planning Office, "Comparativo Por Sectores de Población, Areas y Densidades, Cali, Años 1951-1964." By the time of the field survey in 1968, the number of barrios had grown to one hundred and fifty-seven.

Until 1951 growth appears to have occurred in a rather compact manner. In each of the time periods prior to this date, growth remained concentrated in the area surrounding the existing city, and virtually circled this older area. Growth roughly resembled a series of concentric rings, and development by and large did not leave open, undeveloped areas scattered throughout the area of development. This "ordered" pattern of growth broke down in the 1951-1968 period, perhaps because of the enormous pressure of burgeoning population increase, and barrios were settled in areas that were not contiguous to previous development, so there came to be undeveloped, open-land areas interspersed throughout the areas of recent development. As the pressures toward city migration induced by la violencia cease to be a major factor, as has been the case in the last few years, and the rate of growth of Cali becomes somewhat more normal (i.e., four to five per cent per year rather than more than eight per cent per year), one might expect that the next decade or two will see a return to a more ordered pattern of growth that would include a "filling in" of those areas that were bypassed in the desperate rush for a place to live in the 1951-1968 period.
This desperate rush for a place to live was most typified by the squatter settlements which became a pronounced aspect of the growth of most large Latin American cities. In few cities was the impact of these squatters as overwhelming as in Cali, for the enormous migration induced by \( \text{la violencia} \) brought large waves of migrants to the city. The ordered processes of city growth were unable to cope with these migrants insofar as finding adequate housing was concerned.

Squatter settlements usually take the form of illegal land invasions, in which a group of people, sometimes numbering in the hundreds and occasionally in the thousands, move onto land at some agreed-upon time and immediately construct shacks with whatever material is available. Where it is possible, these squatters try to settle on public land, land that is owned by the government. These invasions are generally well-organized, and contrary to common mythology, are not necessarily communist-inspired. Indeed, evidence shows that these squatters are far from the dregs of society, being better educated, more urbanized, and less given to criminal activity than most reports would have us believe (Mangin, 1967: 21-29).

Indeed, research involving squatter settlements indicates that, far from being the "cancerous sores" that many claim should be bulldozed into oblivion, with their inhabitants removed to "modern" housing, these settlements are perhaps the most viable, economic, and psychologically-
appealing ways of housing poor but hopeful residents that Latin American cities such as Cali have (Turner, 1968: 44-45). The author first became acquainted with research undertaken by John Turner of the Harvard-M.I.T. Joint Center for Urban Studies during his field work in Cali in 1967-1968, and feels that this research, along with the work by William Mangin of Cornell University, has been among the most important of all recent urban research in Latin America. As research with hope for human betterment it is unparalleled. At last poor urban dwellers have research that takes their own hopes and aspirations into account, and builds solutions based on this enormous pool of desire for self-improvement.

Briefly, Turner argues that rather than destroying squatter settlements, governments should support them. This support should take the form of paved streets, water, sewers, electricity, schools, and health centers. Housing, which is by far the most expensive aspect of dealing with poor urban dwellers, should be left to the devices of the dwellers themselves. That these dwellers can provide their own housing has been amply demonstrated time and again throughout Latin America, and in Cali. Further, the governments of most Latin American nations, Colombia included, simply do not have the financial resources to provide housing (Turner, 1968: 44-45). As an extension of Turner's argument, it seems plausible that as the government provides these environmental supports, and leaves housing to the residents, the environmental support projects could employ
many of the squatter settlement residents, and serve as job-apprentice programs. Thus not only would the government be providing support services, but some of the cost of building these projects would be returned to the squatter settlement residents themselves, perhaps to be used in improving their housing, and the residents would at the same time have acquired some job skills.

Field observation in Cali overwhelmingly demonstrates that literally thousands, perhaps tens of thousands, of poor squatter families have dramatically improved their housing over the years through their own devices. The author has visited countless such homes, and perhaps a short account of one such visit in El Rodeo (barrio 114) will convey some of the processes involved. The family came to El Rodeo as part of a squatter invasion in 1962, and immediately put up a one-room shack made with a few bamboo poles, cardboard, and a sheet of corrugated steel on the roof. Within a few months the family had converted this shack into a two-room bamboo wattle-and-daub home, and had begun plans for improvements. Over the next five years brick walls and a cement roof for an eventual second floor were added, and the home was expanded to four rooms. In the few months before my visit, the family had added two glass windows to the front, and a cement patio and patio wall with an iron gate. Flowers bloomed in profusion from empty-can pots on the patio, and the home was now a far cry from a squatter shack. It had become a solid working-class home,
and represented a considerable investment by the family. They were very proud of what they had achieved, but were sad that the city had been so slow in providing needed services. The street in front of the house was still not paved in 1968, and the dust and mud that this brought into the home was of great concern to the señora.

In Cali the poor people know that they must rely on their own devices for any basic improvement in their living conditions. While there is much that the government can and must do to help, it would be a great tragedy if this desire for self-improvement were extinguished. The squatter settlements, which make up a large part of the recent growth of the city, must be looked upon with hope and with support, rather than as blights to be eradicated.

Ascertaining precisely what proportion of recent city growth is attributable to squatter settlements is an impossible task, given the data available. However, some rough estimates can be made, though one of the difficulties in estimating the proportion of the city's population that is made up of squatters is that original squatter invasions may later be recognized by the city and made legal, and then many other residents may move into the barrio. Thus the process in a sense becomes routinized and legitimized.

Among the barrios of Cali, at least twelve (barrios 25, 52, 63, 77, 78, 82, 83, 114, 137, 139) have been documented as having their origins in squatter invasions (Campbell, 1966?: 1-3). In 1964, these barrios made up
sixteen per cent of the city's population. However, there are parts of other non-squatter-established barrios that have been invaded by squatters, and other squatter barrios that were not documented by Campbell. The field survey indicated that thirty-five barrios, in addition to those listed by Campbell, have inhabitants who probably squatted in the barrio. These barrios comprise an additional twenty-four per cent of the population of Cali. However, it was apparent during the field survey that only a portion of the dwellers in these barrios were squatters. If one used a rough estimate that fifty per cent of the people in these barrios were squatters, this would mean twelve per cent of the total population of the city. This twelve per cent, plus the sixteen per cent of the population in the Campbell barrios, brings the total of squatters in Cali to twenty-eight per cent. While this is admittedly a rough estimate, it is in accord with an estimate for Cali made by Charles Abrams, who stated that Cali "has a squatter population that makes up about 30 per cent of the total figure" (Abrams, 1964: 13).

If we accept roughly thirty per cent as the squatter population of Cali in the 1960's, it can be shown that squatters made up a substantial portion of the 1951-1964 population increase in Cali. In 1951, Cali had 284,000 people. By 1964, 354,000 additional people had been added, to reach a population of 638,000. This 1964 population includes 191,000 squatters, thirty per cent of the total population. If one assumes that ninety per cent of these
squatters were residing in barrios established after 1951 (the two barrios that are major exceptions to this are 25 and 56), then 172,000 squatters were in these newly-established barrios. These people comprise half of the people added to Cali's population in the 1951-1964 period. While this, again, is a rough estimate, it is readily apparent that barrios inhabited by squatters made up a substantial portion, perhaps half, of the 1951-1964 growth of the city.

In addition to squatter settlements, there are other groups which have contributed to the recent tremendous growth in the number of barrios in Cali. Of the ninety barrios which were added to Cali in the 1951-1964 period, thirteen were lower-middle-class or middle-class barrios, indicating rather substantial growth among the middle classes during this period of Cali's history. There were only sixteen lower-middle-class or middle-class barrios in Cali existing in 1951, and only three additional upper-class barrios were added by 1964. Thus, in terms of barrio growth, the lower working-class people added the greatest number of barrios, both absolutely and relatively, followed by the barrios added by lower-middle-class and middle-class people. Upper-class barrios grew the slowest, both absolutely and relatively. Thus Cali had a greater proportion of lower and working-class barrios in 1964 than had been the case in 1951.

Among the lower-class and working-class people of Cali, squatter settlements were not the only means of obtaining a home site. Some new immigrants managed, one way or another, to legally purchase plots for a home. Others
banded together in associations which had as their objective eventual home ownerships.

An example of such an association in Cali is the Central Pro-Vivienda de Colombia, a virtually spontaneous organization of 3,850 lower-class family heads who each pay about twenty cents a week to a common fund for acquiring residential land and urban services. The Central is governed by its own general assembly, board of directors and governing committee. Its objectives include: legal acquisition of land for individual home ownership; assistance in home construction; studies to determine the greatest needs of the poor classes and the ability of each family to pay for its land; solidarity of homeless persons without attention to political, religious or racial considerations; exertion of pressure to bring down land prices near the city; encouragement of cooperation and self-help among the poor and defense of the nuclear family; resistance to the creation of new slums and the "invasion" of private lands (Morse, 1962: 490).

Obviously, there are many ways in which barrio development can occur. The growth of the number of barrios in Cali between 1951 and 1964 was based on many of these. Yet, the existence of a barrio does not mean it is fully populated. This dimension, the dimension of population density, also is a factor affecting the structure of the city, and it is to this factor of density that we turn now.

Density of the Barrios

Figure 5 shows the density of the residential barrios of Cali in 1964, in terms of inhabitants per hectare (one hectare equals approximately 2.47 acres). Data for this figure were derived from a mimeographed compilation by the Cali Municipal Planning Office, "Comparativo por Sectores de Población Areas y Densidades, Cali, Años 1951-1964" (no date).
DENSITY OF RESIDENTIAL BARRIOS, CALI - 1964

FIGURE 5

UNACCOUNTED AREA

INHABITANTS PER HECTARE

1 - 99
100 - 199
200 - 299
300 - 399
400+

SCALE IN MILES

0 5 1 2
Close inspection of figure 5 reveals that, in very general terms, densities decline as one moves from the center of the city (defined as barrio 8) to the periphery. There are, however, many barrios, and several areas, that are exceptions. To the west of the center of the city, on the periphery, barrios 136, 137, and 138 show high densities. Barrio 91, southwest of the center of the city, has relatively high density. Barrio 25, northwest of the city center and on the periphery of the city, has relatively high density, as does barrio 82, on the periphery southeast of the city center.

Strikingly, the center of the city and the areas immediately surrounding it do not have the highest densities, except for barrios 3 and 6. To the south and east of the center of the city, roughly approximating a good portion of the working-lower-class and industrial areas, are the parts of the city with the largest areas of high density.

Other parts of the city conform to the generalization that densities are lower the further one goes from the center of the city. The southwest area of the city, which is the part of the city furthest from the center, has almost uniformly low densities. The barrios to the northeast of the city center that lie at the greatest distance generally have low densities. But these conformities to the generalization of density declining with distance from city center do not mask the clear picture conveyed by figure 5: distance from city center is secondary in importance to some other factor in the determination of density. This finding
is amply demonstrated when one examines the relationship between density and the socioeconomic status of the barrio. Table 13 shows this relationship.

TABLE 13
DENSITY OF BARRIOS BY SOCIOECONOMIC STATUS,
CALI, 1964

<table>
<thead>
<tr>
<th>Socioeconomic Status of Barrios</th>
<th>Density (Inhabitants/Hectare)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Upper</td>
<td>12</td>
</tr>
<tr>
<td>2 Middle</td>
<td>74</td>
</tr>
<tr>
<td>3 Lower Middle</td>
<td>125</td>
</tr>
<tr>
<td>4 Working</td>
<td>133</td>
</tr>
<tr>
<td>5 Working Lower</td>
<td>215</td>
</tr>
<tr>
<td>6 Lower</td>
<td>225</td>
</tr>
</tbody>
</table>

This table demonstrates the consistent inverse relationship between density and socioeconomic status. The lower the socioeconomic level of the barrio, the higher the density. When figure 5 is examined from the standpoint of socioeconomic status, it is clear that this is the factor that often (but not always) overrides the factor of distance from city center. The conclusion arising from the examination of the spatial distribution of barrios by density is that two main factors exert an influence, socioeconomic status and distance from city center. The influence of the former (socioeconomic status) seems to predominate in those barrios that are fully settled, while the influence of the latter (distance from city center) seems to predominate in those areas that are in the process of settlement, and are not yet fully inhabited. This means that, for the developed
city, socioeconomic status predominates over distance from the city center in the determination of density.

These findings pose some interesting contrasts with other research. Berry reports that

the negative exponential decline of phenomena with increasing distance from the city center is nowhere more apparent than in urban population densities. Regardless of time or place, this is the pattern to be found; in some four hundred cases examined so far there are no exceptions (Berry, 1965: 419).

Given the nature of the data reported above, this statement seems somewhat overemphatic. Yet Berry did include studies from both the Western and the non-Western world, and in another study pointed out that "in the West central densities rise, then fall; in non-Western cities they register a continual increase" (Berry, Simmons, and Tennant, 1963: 401).

If Cali is a non-Western city, then this statement would not apply. If the central part of the city is defined as those 22 barrios which existed in 1930, then density figures show that only nine of these barrios registered increases in population density in the 1951-1964 period. If the four barrios (7, 8, 13, and 15) which comprised the original colonial city are considered the central area, then the figures show that three of these barrios experienced declines in population in the 1951-1964 period, and the other barrio maintained the same density. In this respect Cali seems to conform more closely to the pattern posited for Western cities, where central densities first rose and then fell.
Perhaps these studies by Berry (cited above), by dealing exclusively with the factors of density and distance, have not uncovered the effect of other factors upon urban population densities, such as socioeconomic status. In this respect, although it is true that in a very general sense densities decline with distance from city center in Cali, this finding by itself would overlook the influence of other factors, and is thus only part of the reality. Or, perhaps, the finding reported in this study is a phenomenon that has only become noticeable within the past decade, after the period about which Berry reported.

There is evidence, however, that the findings reported in this study are not isolated ones. Breese, in examining urbanization in developing areas, commented that one of the most noticeable features of large Indian cities is their combination of very high population density in relatively small areas and relatively low population density over other large areas. . . . In addition to the small area-high density, low density-large area contrast, these same large Indian urban areas are also marked by burgeoning areas of temporary settlement, usually either in or near the Old City, or at the periphery of the urban area (Breese, 1966: 56).

Cali seems to conform to some degree to this pattern. There is high population density in some small, often peripheral areas, while there are large areas with low population densities. Unlike these Indian cities, however, Cali has few areas of temporary settlement; the squatter areas, with the exception of those few from which squatters were forcibly evicted, are very clearly intended by their residents as areas of permanent settlement.
In his study of Latin American cities, Harris supported the findings concerning density reported in this study, noting that "in Latin American cities the areas with the highest population densities are often found on the peripheries of the urban centers rather than in the traditional central core of the city" (Harris, 1971: 38).

The most closely-related study is Amato's examination of population densities and socioeconomic class in Bogotá. His population density data clearly indicate that the "elites" live in areas of least population concentration and that the middle socioeconomic groups live in areas of maximum concentration. The lower income groups on the other hand, live in areas of middle-range population densities (Amato, 1969: 67).

It is curious that Cali and Bogotá, within the same country, exhibit different density patterns, although there seems a probable explanation for this phenomenon. In Cali, there is a great deal of level land available for the expansion of the city, so that urban land values are not greatly affected by the growing population. This is not the case in Bogotá; land there is somewhat scarcer. As a result, in Amato's study, "if density scores are standardized in terms of distance from the center city, the socioeconomic groups arrange themselves on a seven-class scale from upper income groups to lower groups, strictly according to class rank, indicating the relative economic advantage of each class for obtaining low-density living at varying distances from the center city" (Amato, 1969: 73). Thus in Bogotá, as in Cali, when
distance is standardized, there is an inverse relationship
between socioeconomic status and population density.

In terms of population density, Cali assumes a
stance somewhere between the Western and non-Western cities
reported in the literature. Central city density changes
over time seem similar to those of Western cities, while
high peripheral densities in some parts of the city are more
similar to those of non-Western than Western cities. The
inverse relationship between population density and socio-
economic status is a phenomenon common to both Western and
non-Western cities.

The Spatial Distribution of
Socioeconomic Status

The close association between socioeconomic status
and density reported in the previous section of this chapter
leads us to a consideration of socioeconomic status. Socio-
economic status in this study has been determined through a
field study of housing in all the 131 residential barrios
of the city. Each of the barrios was classed on a scale
ranging from one to six, as reported in the third chapter
of this study. "One" designated a barrio as upper class,
"two" as middle class, "three" as lower middle class, "four"
as working class, "five" as working lower class, and "six"
as impoverished lower class. Figure 6 shows the spatial
distribution of barrios by socioeconomic status.
THE DISTRIBUTION OF RESIDENTIAL BARRIOS
BY SOCIOECONOMIC STATUS, CALI - 1968

FIGURE 6

SCALE IN MILES

LOWER CLASS
WORKING LOWER CLASS
WORKING CLASS
LOWER MIDDLE CLASS
MIDDLE CLASS
UPPER CLASS
UNACCOUNTED AREA
Examination of the areas occupied by barrios in each of the socioeconomic levels indicates that the city of Cali is characterized by a clear pattern of socioeconomic organization. All of the older (pre-1951) upper-class areas of Cali are north of the Cali River, lying between the Cali River and the mountains. Of the new (post-1951) upper-class barrios, barrio 143 is to the west of the city center, and is probably best considered as an extension of the upper-class areas to the north. Barrios 130 and 132 are spacious, very low-density areas far from the city center in the most southern part of the city, near the Cali-Popayán highway. North Americans would probably refer to these areas as suburbs, although they are officially parts of the city. Indeed, some of the people living in these two barrios are North Americans. The most southern part of barrio 120 has some upper-class homes, although the barrio as a whole is rated middle class, and barrios 119 and 140, though still essentially devoted to agriculture, do have a few scattered upper-class homes.

Outside the city, higher up the mountains, there are scattered settlements of homes of the well-to-do. By and large, however, these are not suburbs, nor are they "primary" residential areas. Rather they are vacation or "summer" homes of the well-to-do, and most of these families have their main residences within the city of Cali.

Indeed, in Cali all socioeconomic levels reside within the boundaries of the city. There is not yet any
evidence of the suburbanization that is so common in the United States, and as long as a good deal of city land remains vacant, it does not appear that any substantial suburbanization will take place in the near future. In fact, a good share of barrio 131 is still operated as a sugar plantation, with extensive cane fields within city boundaries.

In general, the upper-class areas occupy two parts of the city. One forms a sector north of the center of the city, and the other is on the southern "end" of the city. Future upper-class development likely will take place in areas adjoining these sectors, or in the foothill areas lying between them. Thus even future upper-class development is likely to be within a "band" of the city running along the foothills. In no case does there appear to be any evidence of upper-class barrios developing on the flat lands of the Cauca River Valley.

The spatial organization of middle-class barrios is similar to that of upper-class barrios. Of the fourteen middle-class barrios, seven are clustered in a band northeast of the center of the city, between the Cali River and the foothills, and seven are southwest of the center of the city, again on or near the sloping land of the foothills. No middle-class barrios are located in the extensive and heavily-populated areas east and southeast of the center of the city.

Lower-middle-class barrios are clustered south and west of the center of the city, and are near the center.
The two exceptions are barrio 26, to the northwest of the center of the city, and barrio 39, to the north.

Taken together, upper-class, middle-class, and lower-middle-class barrios occupy a wide band of the city, stretching from northeast to southwest. In the northeast, the Cali River separates this land from the working-class and lower-class barrios to the south and east. Of the seventeen residential barrios in Cali north of the Cali River, only two are working-class or lower-class barrios, barrios 25 and 157. In the southwest, the upper-class, middle-class, and lower-middle-class barrios occupy a fairly large area relatively near the center of the city which is not demarcated by any natural boundaries, although the area is surrounded by some vacant land, which is, in all probability, the area of the city where future middle-class and lower-middle-class expansion will occur.

The working-class barrios of the city, except for the four barrios which comprise the "working class" commercial area of the city (barrios 3, 4, 11, and 12), are scattered to the south and east of the center of the city. The only exception is barrio 157 (mentioned above), which is a large public housing project in the midst of a middle-class area of the city. It is not readily apparent why these barrios are so scattered, although perhaps this is due to a factor of time--most of the working-class barrios are somewhat older than the lower-working-class barrios which
surround them, and thus their residents have had more time to improve their homes and their socioeconomic status.

The lower-working-class barrios are by far the most prevalent in the city, including fifty-nine of the one hundred and thirty-one residential barrios of the city and over half the city's population. Most of these barrios (all but eight) are located in a wide "wedge" of the city stretching east and south of the center, on the flat land of the Cauca River Valley. The eight other barrios lie south and west of the center of the city. Two of these (barrios 6 and 30) bifurcate the upper-class and middle-class band of barrios, three others (barrios 134, 136, and 138) are adjacent to the largest mountainside slum area in the city (barrios 137 and 139), and the other three are along the Cali-Popayán highway to the southwest of the center of the city. These latter three barrios may well be more a reflection of rural than urban socioeconomic organization, as most of this area of the city is still in the beginning stages of development and reflects more of a rural than an urban way of life.

The lower-class areas often referred to as tugurios in Colombia are widely scattered, although twelve of the fifteen barrios are located in the working-class and lower-working-class "wedge" to the east and south of the center of the city. There are two general groupings of lower-class barrios within this wedge. Five barrios are just south of the Cali River, across from middle-class barrios, and either
within or adjacent to the industrial area of the city. The other seven barrios within this "wedge" area are all near or on the periphery of the city.

The other three lower-class barrios are on the steep slopes or ridges of the mountains, barrios 25, 137, and 139. Barrio 25 is relatively old (pre-1951), in rough terrain, and quite difficult to reach, which may explain its lack of attraction for more affluent Caleños. Barrios 137 and 139, the largest lower-class area in the city in terms of population, developed essentially at the end of the band of upper-class, middle-class, and lower-middle-class barrios.

In general terms, the spatial organization of socioeconomic status shows a clear pattern. Running from southwest to northeast near the mountains are the upper-class, middle-class, and lower-middle-class barrios. Running south and east of the center of the city is a large "wedge" of working-class, lower-working-class, and lower-class barrios. Although some barrios are exceptions, this pattern is rather distinct. To the southwest of the city center, in the "arm" of the city roughly bordering the Cali-Popayán highway, the low level of development has not yet allowed any clear patterns of socioeconomic organization, although it is apparent that a new upper-class area is developing at the tip of this "arm."
The Spatial Distribution of Family Status

In the review of the literature, it was shown that the two factors that have been found to be most fundamental in the spatial distribution of social organization were socioeconomic status and family status. In the previous section of this chapter housing was used to portray socioeconomic status. In this section we shall examine two indicators of family status, number of family members and number of family units per housing unit. These two indicators are graphically portrayed in figures 7 and 8.

Figure 7 shows the mean number of family members for each of the residential barrios of Cali. The pattern which emerges is that those barrios with the fewest members per family are closest to the center of the city (barrio 8), while those barrios with the most members per family are farthest from the center of the city. Indeed, the pattern indicates that the more family members, the farther the barrio is from the center; this pattern holds for each of the five categories shown in the figure. Table 14 shows the relationship. In this table, the distance of each barrio from the city center (the geographical center of barrio 8) was measured by drawing circles on a map with radii at one mile intervals from the city center. If the geographical center of the barrio was within the circle with a radius of one mile from city center, the barrio was listed as being one mile from city center; if the geographical center of the
THE DISTRIBUTION OF RESIDENTIAL BARRIOS
BY FAMILY SIZE. CALI - 1964

FIGURE 7
THE DISTRIBUTION OF RESIDENTIAL BARRIOS
BY NUMBER OF FAMILIES PER HOUSING UNIT,
CALI - 1964

FIGURE 8
TABLE 14
MEAN DISTANCE OF BARRIOS FROM CITY CENTER, BY MEAN NUMBER OF FAMILY MEMBERS PER BARRIO

<table>
<thead>
<tr>
<th>Mean Number of Family Members per Barrio</th>
<th>Mean Distance of Barrios from City Center, in Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 4.4</td>
<td>1.77</td>
</tr>
<tr>
<td>4.5 - 4.9</td>
<td>2.11</td>
</tr>
<tr>
<td>5.0 - 5.4</td>
<td>2.43</td>
</tr>
<tr>
<td>5.5 - 5.9</td>
<td>2.49</td>
</tr>
<tr>
<td>6.0 +</td>
<td>2.67</td>
</tr>
</tbody>
</table>

barrio was outside the circle with a radius of one mile but inside a circle with a radius of two miles, then the barrio was listed as being two miles from city center; if the geographical center of the barrio was outside the circle with a radius of two miles but inside a circle with a radius of three miles, then the barrio was listed as being three miles from city center; etc. All of the barrios were so classified by distance from city center, with none of them lying within a circle with a radius of more than six miles from the center of the city. The distances from city center of all of the barrios in each category (of mean number of family members per barrio) were then averaged, to determine the mean distance from city center of each category of barrio. A clear concentric pattern emerged. The greater the mean number of family members per barrio, the greater the mean distance of barrios from city center.

Caution should be exercised in the use of these data on number of family members, because the definition of
family on the 1964 Colombian census form is quite broad. The form notes that all persons who spent the night before the date of the census in the dwelling should be counted. This includes the head of the family and his spouse, unmarried children (including the recently-born), married children and their families, other relatives, guests, boarders, servants, and others. The category of servants is the one which may differentially weight the members-per-family averages for the various socioeconomic levels; there are undoubtedly more servants per family in upper-class and middle-class barrios than there are in lower-working-class and lower-class barrios, but data are not available to determine the numbers involved. One might surmise, however, that servants do not constitute a large portion—even of the households of the middle and upper classes, if the pattern in Colombia is reasonably similar to the pattern in Brazil. For Brazil, Smith notes that "servants living in the homes are not particularly numerous, but because of their presence in the households of those of the upper and middle socioeconomic classes, their 'visibility' is especially great" (Smith, 1970: 193). Overall, 1.4 per cent of all Brazilian households headed by persons aged 30-39 is composed of employees (Smith, 1970: 195).

The members per family classified by socioeconomic levels of the barrios are shown in table 15. From this table it appears that the upper and middle-class families are slightly larger than families in the other socioeconomic
levels. However, servants undoubtedly add to the size of the upper and middle-class families, so apparently the average family size in Cali shows little variation by socio-economic level.

**TABLE 15**

MEMBERS PER FAMILY OF BARRIOS BY SOCIOECONOMIC STATUS, CALI, 1964

<table>
<thead>
<tr>
<th>Socioeconomic Status of Barrios</th>
<th>Members per Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Upper</td>
<td>5.7</td>
</tr>
<tr>
<td>2 Middle</td>
<td>5.7</td>
</tr>
<tr>
<td>3 Lower Middle</td>
<td>5.3</td>
</tr>
<tr>
<td>4 Working</td>
<td>5.5</td>
</tr>
<tr>
<td>5 Working Lower</td>
<td>5.3</td>
</tr>
<tr>
<td>6 Lower</td>
<td>5.3</td>
</tr>
</tbody>
</table>

Figure 8 shows the spatial distribution of residential barrios by number of family units per housing unit, which is the second of the two measures of family status utilized in this study. Again, as in the case of the number of members per family, there is a clear relation between the pattern of this indicator of family status and distance from the center of the city. Those barrios which have the fewest family units per housing unit tend to be furthest from the center of the city, and those barrios which have the most family units per housing unit tend to be nearest the center of the city. Table 16 shows this relationship. In this table, distance from city center was measured in the same manner as in table 14. Again, as in table 14, a clear
TABLE 16
MEAN DISTANCE OF BARRIOS FROM CITY CENTER,
BY MEAN FAMILY UNITS PER HOUSING UNIT

<table>
<thead>
<tr>
<th>Mean Family Units per Housing Unit</th>
<th>Mean Distance of Barrios from City Center, in Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 1.0</td>
<td>2.91</td>
</tr>
<tr>
<td>1.1 - 1.2</td>
<td>2.71</td>
</tr>
<tr>
<td>1.3 - 1.4</td>
<td>2.18</td>
</tr>
<tr>
<td>1.5 - 1.6</td>
<td>2.15</td>
</tr>
<tr>
<td>1.7 +</td>
<td>1.68</td>
</tr>
</tbody>
</table>

The concentric pattern is shown. The smaller the number of family units per housing unit, the greater the mean distance of barrios from city center.

There were few multi-family dwelling units to confuse the issue. There were only two large multi-family housing projects for the middle and lower classes, and these were in barrios 54 and 157. There were also a few residential hotels and apartments in middle and upper-class areas, such as barrios 28, 33, and 37. Of all the barrios in the city, only barrio 157 is not dominated by single-family dwellings; barrio 157 has four dwelling units for one hundred and sixty-two families.

The number of family units per housing unit in relation to the socioeconomic level of the barrios is shown in table 17. This table shows that, except for the lower class, the number of family units per housing unit increases as one goes from upper-class barrios to working-lower-class
### TABLE 17

**FAMILY UNITS PER HOUSING UNIT OF BARRIOS**

**BY SOCIOECONOMIC STATUS, CALI, 1964**

<table>
<thead>
<tr>
<th>Socioeconomic Status of Barrios</th>
<th>Family Units per Housing Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Upper</td>
<td>1.1</td>
</tr>
<tr>
<td>2 Middle</td>
<td>1.1</td>
</tr>
<tr>
<td>3 Lower Middle</td>
<td>1.3</td>
</tr>
<tr>
<td>4 Working</td>
<td>1.4</td>
</tr>
<tr>
<td>5 Working Lower</td>
<td>1.5</td>
</tr>
<tr>
<td>6 Lower</td>
<td>1.3</td>
</tr>
</tbody>
</table>

**barrios.** Lower-class **barrios** are an exception, probably because of the temporary nature of many of their dwellings, which are simply too small to hold another family. When another family arrives, it is more likely to put up its own temporary abode than it is to move into the dwelling of friends or relatives.

Now that the data have been presented, we can examine the structure of the city of Cali in a more comprehensive manner than has yet been done in this study. This is the subject of the concluding section of this chapter.

**The Structure of Cali**

The structure of a large city such as Cali is affected by numerous factors which have exerted their influence over a period of time. Thus time is itself a factor. In Cali, more than four hundred years have elapsed since the city was founded. During most of this considerable
period of time Cali remained a small town, and its structure, unaffected by rapid growth, probably changed very slowly. Only with rapid growth during the twentieth century did substantial change begin. One aspect of this change stands out. This is the change from a pattern where the rich and important people lived clustered around the central plaza to a very different pattern. It is the purpose of this study to describe this different pattern.

The scant literature describing the structure of the Latin American city, reviewed earlier in this study, shows that a plaza-centered pattern for the residences of the rich was virtually universal. Everywhere, however, this pattern appeared to be at one stage or another of breakdown. Here the literature becomes sketchy. In some cases, this breakdown is seen as a shift to the North American pattern, where the more well-to-do live on the periphery of the city and the poor live in the center. In other cases, this shift to a North American pattern is questioned but no clear alternative for an emerging "new" pattern is advanced. This, then, is the boundary of knowledge about the structure of the contemporary Latin American city. What are the characteristics of this new pattern (if indeed it can be called a pattern), and how is this pattern evolving?

One cannot generalize a specific case study, as is undertaken here for Cali, to all the cities in Latin America. Yet as a large, rapidly-industrializing, non-capital city in the second most populous Spanish-speaking country in South
America, Cali may be fairly typical of a growing number of cities, and the examination of its structure may provide clues for the examination of the structure of some other cities in Latin America.

The recency of much of the growth of Cali is of paramount importance for its structure. The rapidity of Cali's growth has led to a somewhat disorganized pattern in the peripheral parts of the city, and especially in the southern "arm." Yet, even with this complication, it is apparent that the growth has occurred within the framework of certain forces, for the city exhibits marked regularities in a number of respects. First, the growth has spread outwards from the center and, except for the most recent period, has filled in the areas closest to the center of the city before moving further outward; the growth has occurred all around the center, except for the mountainous areas on one side. This first force is the tendency to locate as close as possible to the center of the city. Unlike people in the United States, most Caleños do not have their own means of transportation, and must locate within the bounds of public transportation. The result is a relatively compact city, where the furthest part of the city is only about six miles from the center.

A second force affecting the pattern of city growth relates to the availability and advisability of locating in certain areas. While little understood, this force is apparently of some consequence in the spatial distribution
of various socioeconomic levels. Vacant land may be available in a number of areas on the edges of the settled parts of the city, but squatting in certain areas (i.e., near the well-to-do and powerful) is likely to be much more difficult than squatting near other squatter settlements. The force operating in this case is one of like socioeconomic levels being attracted, for a variety of reasons, to each other. Thus growth, in and of itself, can lead to socioeconomic "clustering" even without other factors.

But other factors are involved in the determination of the structure of the city, and one of these is land use. Of paramount importance in the examination of land use is the finding that in Cali there is a rather clear degree of functional differentiation. The industrial function occupies a quite distinct sector of the city, and the commercial function, while occurring in many areas of the city, is clearly concentrated in the central core. This finding contrasts sharply with one of the basic aspects of the pre-industrial city as characterized by Sjoberg, where there is a "low incidence of functional differentiation" in land-use patterns (Sjoberg, 1960: 96).

Another of the characteristics of Sjoberg's pre-industrial city is the existence of "certain finer spatial differences according to ethnic, occupational, and family ties" (Sjoberg, 1960: 95-96). Nowhere in Cali were such spatial differences observed. While color differences do exist in the racial composition of the populace of Cali,
(although data are not available to examine these differences), color generally manifests itself in socioeconomic rather than ethnic levels of organization. This is not to say that color differences have no effect; they do. Generally, however, the darker one's skin, the lower one's socioeconomic level. Thus the clustering that does occur is that of socioeconomic rather than ethnic differentiation. Occupational clustering is virtually non-existent in Cali, which sharply distinguishes Cali from cities such as Calcutta (Berry and Rees, 1969) and Cairo (Abu-Lughod, 1969).

The third basic contrast between preindustrial and industrial cities that was posited by Sjoberg was "the pre-eminence of the 'central' area over the periphery, especially as portrayed in the distribution of social classes" in the preindustrial city (Sjoberg, 1960: 95); and "the preindustrial city's central area is notable also as the chief residence of the elite" (Sjoberg, 1960: 97). In Cali, few members of the elite live in the central area of the city. The commercial function, however, is still dominant in the central area of the city, although there is some evidence that noncentral commercial nuclei are starting to develop. In this aspect of land use, Cali still carries, in its ecological organization, remnants of the patterns established there earlier in its history, when it had been a small preindustrial city. For Cali, the decentralization of the commercial function seems to be the last aspect of a preindustrial city to change. From the standpoint of the
dynamic processes involved in the change from a preindustrial to an industrial city, this is interesting, for little is known about the temporal sequences of the change.

In general, Cali does not conform to the three basic land use patterns posited by Sjoberg to characterize the preindustrial city. In the Sjoberg use of the term, Cali does not evidence preindustrial patterns of ecological organization.

Sjoberg also focuses on the industrial as well as the preindustrial city (Sjoberg, 1965). He notes that "industrial cities, in contrast to preindustrial ones, are more likely to revolve about a commercial and/or industrial focus than around a religious--governmental complex" (Sjoberg, 1965: 229). Cali certainly fulfills this criterion. Its religious importance is negligible, and while it is the capital of the department of El Valle del Cauca, it is not a governmental center of much importance. Important governmental matters are handled in Bogotá. The economic life of Cali is dominated by industry and commerce.

Sjoberg also characterizes the industrial city as exhibiting "a high degree of specialization in land use," (Sjoberg, 1965: 229) a characteristic to which Cali has already been shown to conform, and a tendency of the upper and middle socioeconomic groups "to reside beyond the city's core, leaving the central area to various low-status groups, and elements of the elite as well" (Sjoberg, 1965: 229-230).
Again, Cali conforms to this generalization. In sum, Cali appears in this context to be an industrial city.

While an examination of land use in Cali allowed a comparison with theoretical formulations of preindustrial and industrial cities, an examination of socioeconomic status and family status allows a comparison of Cali with Western and non-Western city structures, as derived through studies of social area analysis and factorial ecology. It is this latter task that the study now pursues.

Figure 6 showed that socioeconomic status varied sectorially. Each socioeconomic level occupied a distinct sector of the city, conforming to the city structure postulated by Homer Hoyt. Among socioeconomic levels, it was clear that the more advantaged lived at lower densities, and that there was an inverse relationship between density and socioeconomic status.

The sectorial distribution of socioeconomic status agrees with the findings of Berry and Rees (1969) and Anderson and Egeland (1961). In these studies, and in the study of Cairo by Abu-Lughod (1969), it appeared that Western cities would have more pronounced levels of differentiation than non-Western cities, so that the clear emergence of a sectorial distribution of socioeconomic status was a characteristic of Western cities. Cali in this respect is Western.

The dynamics by which such a sectorization develops are poorly understood. Amato, in analyzing elite residential
areas in Bogotá, discusses two factors causative to elite location, external environmental forces such as climate and topography, and the availability of services such as communication and transportation (Amato, 1968: 251). A third factor probably ought to be added, and that is the tendency for like groups to congregate, and unlike groups to remain separated. While data are not available to test such an assumption, this does appear to be a psychological factor of some importance in Cali.

In Cali, it appears that upper-class residents have consciously sought to locate in the higher part of the city, along the foothills. These locations are not subject to the flooding that periodically plagues the flatter areas of the city, and are slightly cooler, lying at a higher elevation. The steeper slopes, occupied by lower-class barrios 25, 137, and 139, are not desirable residential locations because of the steepness of the terrain, and the constant danger of landslides. Thus these locations are left to those of the lower class who are economically and politically unable to compete for the more desirable locations.

Unlike many of the large cities in Latin America, Cali is not severely limited in its supply of residential land. Except for the mountains along one side of the city, topography is not an influencing factor. Thus Cali, more than most other large cities in Latin America, shows what happens to the structure of the city when the normal forces of growth and development are allowed to run their course,
without the confounding factor of difficult topographical features. For many cities in Latin America this is not true; many of these "cities show in a striking manner the effect of topography on the form and direction of city growth" (Hoyt, 1963: 452).

The second factor involved in residential location is the availability of services, especially transportation. In Cali, transportation means cars, taxis, and busses for the more well-to-do; and busses for the poor. Roads therefore become the key transportation arteries.

In the literature it has been suggested that the "elites may be seen to have moved . . . in the direction of rapid transportation arteries" and to have "arranged themselves contiguous to these arteries or very close to them—generally in a sector pattern" (Amato, 1968: 253). Peñalosa suggests that arterial accessibility is a major determinant of ecological patterns in the transitional city (Peñalosa, 1967: 221-229). (The transitional city is at a stage between the preindustrial and the industrial.) In three small transitional Mexican cities, Peñalosa found that families of higher socioeconomic status are found primarily along arterials and importantly but to a somewhat lesser extent, in the vicinity of the plaza. The more industrialized the city, the more characteristic is this pattern. The more industrialized the city, the more dispersed are the residences of the rich and comfortable from the central plaza (Peñalosa, 1967: 226).

In Cali, a city that has been shown to be far more industrial than preindustrial, examination of the relationship between arterial highways (shown in figure 1 by heavy
black lines) and the socioeconomic level of the barrios indicates that the higher the socioeconomic level of the barrio, the greater is the likelihood that the barrio will be bordered by an arterial highway. Table 18 shows this relationship.

TABLE 18
BARRIOS BORDERED BY ARTERIAL HIGHWAYS,
BY SOCIOECONOMIC STATUS, CALI, 1968

<table>
<thead>
<tr>
<th>Socioeconomic Status of Barrios</th>
<th>Per Cent of Barrios Bordered by Arterial Highways</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Upper</td>
<td>100</td>
</tr>
<tr>
<td>2 Middle</td>
<td>93</td>
</tr>
<tr>
<td>3 Lower Middle</td>
<td>73</td>
</tr>
<tr>
<td>4 Working</td>
<td>61</td>
</tr>
<tr>
<td>5 Working Lower</td>
<td>44</td>
</tr>
<tr>
<td>6 Lower</td>
<td>27</td>
</tr>
</tbody>
</table>

Unlike the Mexican cities studied by Peñalosa, Cali no longer has any significant number of upper or middle-class families in the vicinity of the plaza. These families reside almost exclusively along arterial highways.

If the accessibility of transportation is a value sought by everyone, then it stands to reason that those areas of the city that provide the greatest accessibility will be most sought-after. The upper and middle classes, with their greater economic and political resources, would obtain the choicest areas, and the lower classes would be left with the least desirable areas. In this sense, the
sectorization of the city by socioeconomic levels may have been helped by development along transportation arterials, as suggested by Hoyt in his sector hypothesis. Thus arterial accessibility does appear to be a factor in the development of the socioeconomic structure of the city.

Family status is the second major influence in determining the structure of the city. In the review of the literature, family status was shown to vary concentrically for Western cities (Anderson and Egeland, 1961; Timms, 1971; Rees, 1972). For non-Western cities, and for cities somewhere in the transitional stage between preindustrial and industrial, it appeared that the family status factor had not yet clearly emerged as a separate dimension of urban differentiation, being intertwined with socioeconomic status, ethnic status, and other factors such as "life-style"; in such cities there appeared to be less-clearly delineated factors of intra-urban differentiation (Abu-Lughod, 1969; Berry and Rees, 1969).

In Cali, the two indicators of family status examined both revealed a rather clear concentric pattern. A comparison of the two indicators of family status with socioeconomic status revealed that there was a weak relationship between socioeconomic status and family units per housing unit, and no definite relationship between socioeconomic status and members per family. Thus, though there may be some small degree of relationship between socioeconomic status and family status, it is clear that these two factors are by no means intertwined; each of these factors explains
a separate dimension of urban differentiation. In this sense Cali is more Western than non-Western, and more industrial than preindustrial or transitional.

Cali in the late 1960s has passed through the transitional phase from preindustrial to industrial in terms of the structure of the city. The quiet, plaza-centered colonial town of yesterday is no more. A modern industrial city has grown rapidly from the colonial past, changing its structure to a form that would be almost unrecognizable by a Caleño of several decades ago.
Chapter VI

CONCLUSIONS

This study has described the patterns of land use, population density, socioeconomic status, and family status in Cali, Colombia. This description has utilized the areal unit of the barrio for the presentation of the data.

These data show that there is a substantial degree of functional specialization in land use in Cali, as evidenced by a clear and distinct central commercial area and a rather sharply-defined industrial area. At the same time, there are still a number of traditional commercial functions, such as sidewalk vendors, scattered throughout the city. While an assessment of land use showed Cali to be more an industrial than a preindustrial city, it was clear that the commercial function was still in the process of changing from a preindustrial to an industrial level of organization, allowing a glimpse of the dynamic processes involved in the transition from a preindustrial to an industrial ecological structure.

While the density of the population of Cali declined from the center of the city to the periphery, level of socioeconomic status appeared to have a greater influence on
density than distance from city center. As a result, some of the poorer peripheral areas of the city had higher densities than more central areas. In this respect Cali was more like non-Western cities such as Calcutta than Western cities. At the same time, central city densities in Cali are now declining, which is more characteristic of Western than of non-Western cities. Like the examination of land use, the examination of density afforded a glimpse of the city in the process of change in its ecological structure.

The analysis of the spatial distribution of socioeconomic status and family status showed that socioeconomic status varied sectorially and family status varied concentrically. This confirms the findings of previous studies in social area analysis, and adds a Latin American example to the widening body of research exploring the dimensions of urban social differentiation.

The clear sectorization of socioeconomic status and concentric distribution of family status in Cali, indicative of a rather pronounced level of urban differentiation, is more characteristic of industrial than it is of preindustrial cities. Thus, while land use and density data showed that Cali does not totally conform to the characteristics of industrial and Western cities, it is clear that Cali is much closer to these theoretical city types than it is to non-Western and preindustrial cities. If this were not the case,
then the differentiation of socioeconomic status and family status areas would have been much less clearly defined.

In theoretical terms, the shape of the city described in this study conforms much more closely to the sector hypothesis of Hoyt than it does to the concentric zone theory of Burgess or the multiple nuclei theory of Harris and Ullman. As Hoyt hypothesized, the city of Cali has upper-class neighborhoods that moved outward toward the periphery of the city in an axial fashion, and middle-class neighborhoods that developed beside them. These areas occupied high ground away from flood areas, and grew in the same direction for a long period of time. The Harris and Ullman theory, suggesting a group of nuclei rather than a central core, was not confirmed in Cali, nor was the Burgess theory, which suggested that each concentric zone of the city had certain characteristics distinguishing it from the other zones. Consequently those studies of the ecology of the Latin American city which have suggested that the peripheral zone of the city would eventually contain the rich and the center of the city the poor are not confirmed. The evidence does not show that Cali is moving in the direction of what often has been assumed to be the North American pattern of city structure.

But the evidence does confirm the theory of social area analysis, which holds that, for the industrial city, and to a lesser extent for the preindustrial city, three factors (socioeconomic status, family status, and ethnic
status) pretty well "explain" urban social differentiation. In Cali the factors of socioeconomic status and family status do describe the basic structure of the city, and allow an assessment of such intervening factors as topography and transportation accessibility.

Cali is essentially an industrial city. It does not "fit" the characteristics of the preindustrial city as posited by Sjoberg, and it conforms to the patterns of spatial organization found for Western industrial cities, where socioeconomic status is distributed sectorially and family status is distributed concentrically.

In comparing Cali with cities in other parts of the world one must exercise caution. In North America, for example, massive suburbanization accompanied by declining central city populations has altered the manner in which the ecological patterns developed, based as they were on the assumption of the growth of the city. Thus the focus in North America may come to be the metropolitan region rather than the city itself. In Cali massive suburbanization is still far in the future, if indeed, in the different sociocultural context, such trends ever do develop.

In several ways Cali is advantageous as an example of a city in Latin America. Cali is in Colombia, which "is almost as diverse socially and culturally as Brazil, and in many ways is more representative of Spanish America in general than is any other one of the eighteen nations in the group" (Smith, 1970: xvi). The topography in Cali, unlike
that in so many other Latin American cities, is not a particularly constraining factor, so the normal processes of structural development can occur in an unimpeded fashion. Finally, Cali is at a developmental stage that has just passed beyond the transitional to the industrial. We can still "see" some of the dynamic processes involved in this change, such as lower central densities along with still-high peripheral densities, and a centralized commercial area with the incipient development of additional commercial nuclei.

Whether Cali is typical or atypical of cities in Latin America remains to be determined. Only subsequent research can provide the comparisons that are now lacking. But it is apparent that the methodology utilized in this study is applicable in the Latin American context, and indeed describes urban social differentiation in Cali rather clearly.
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