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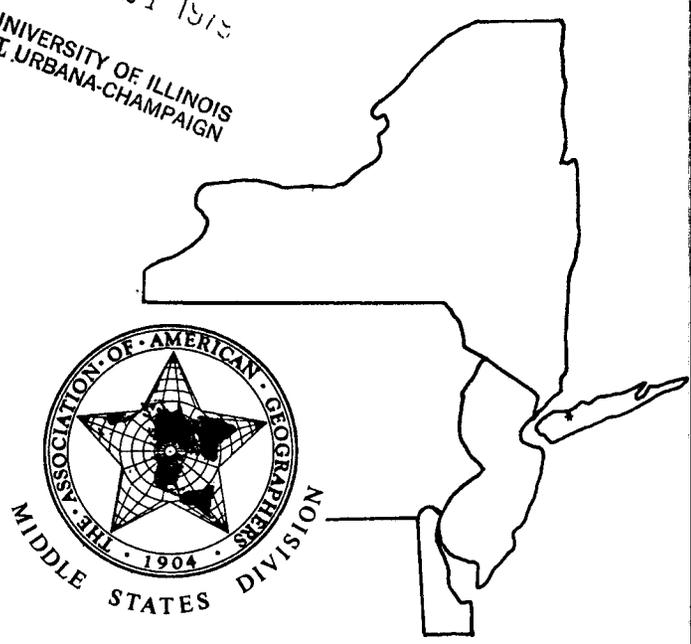
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Association of American Geographers

VOLUME XI , 1977

C.W. Post College of Long Island University  
Greenvale , New York

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A note on the preparation of manuscripts for submission to the Proceedings appears on pages 114 and 115.

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PROCEEDINGS  
OF THE  
MIDDLE STATES DIVISION  
ASSOCIATION OF AMERICAN GEOGRAPHERS

VOLUME XI, 1977

C.W. POST COLLEGE OF LONG ISLAND UNIVERSITY  
GREENVALE, NEW YORK  
OCTOBER 21-22, 1977

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|  |                     |    |
|--|---------------------|----|
| The Boundary Effect and the Niagara Frontier.....  | Gregory P. Stein    | 74 |
| Decentralizing Police Services: A Feasibility Study of Syracuse,<br>New York.....  | Ralph A. Sanders    | 77 |
| The Schoharie County Cooperative Program: A Case Study in Applied<br>Geography.....  | Paul R. Baumann     | 81 |
| Implications of Applying Geography.....  | John W. Frazier     | 85 |
| Student Use of Statistical Mapping Under Time Sharing..  | Alex Rees Clark     | 89 |
| A Role For Geography in Continuing Education.....  | Robert C. Ziegenfus | 93 |
| Widowhood, Marriage Migration and Marriage Partner Preferences in<br>Colonial Tlazazalca (Michoacan, Mexico): 1750-1800..... | Leon I. Yacher      | 97 |

ABSTRACTS

|   |  |     |
|---|--|-----|
| Ethnic Considerations in Urban Ecological Form: The Example of<br>Hispanic-Americans in the Metropolitan Southwest.....   | Lawrence A. Herzog                       | 102 |
| The Effect of Large-Scale Housing Developments on Abandonment: The<br>Case of Starrett City....                           | Ralph L. Urrico and Michael P. Marchioni | 102 |
| Mining and Migration.....   | Rolf Sternberg                           | 102 |
| Social and Spatial Dimensions of Abortion in a Cleveland, Ohio Sample.<br>.....   | Norah F. Henry                           | 103 |
| Where We Are From or An Overview of the Origin of PH. D's in<br>Geography.....  | Jerry D. Gerlach                         | 104 |
| Walking Tours and Streetmarker Systems: A Demonstration Project in<br>Neighborhood Geography and Community Education..... | John C. Muir                             | 104 |
| Wine and the World: A Stimulus to Geographic Understanding.....   | Edmund B. Woods                          | 104 |
| The Japanese Golf Boom.....   | Charles A. Heatwole                      | 105 |
| Snowmobile Activity: Historical Trends and Spatial Distributions.....   | Malcolm Fairweather                      | 105 |

SPECIAL SESSIONS

The Water Resources of Long Island: A Classic Case of Geographic  
Limits..... *Chair:* Leonard Zobler 106

Issues in Geographic Education..... *Chair:* Arlene Rengert 112

Applied Geography: Some Examples and Implications.....  
..... *Chair:* Martha L. Corry 113

\*\*\*\*

Instructions for Papers Presented at Annual Meeting of Middle States  
Division, AAG..... 114

# THE USE OF LUNR IN AGRICULTURAL LAND USE RESEARCH

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LUNR is the acronym for the Land Use and Natural Resource Inventory developed by the Center for Aerial Photographic Studies at Cornell University for the New York State Office of Planning Coordination. It is a statewide, computer-based geographic information system that provides a detailed portrait of the State's land use and natural resources. (1) Basic data for LUNR were compiled from air photos (1:24,000) taken in April and May of 1968. This information was then transposed onto overlays for each 7-1/2 minute-USGS quadrangle (1:24,000) covering the State.

Unlike most previous inventories in which information was only mapped, LUNR data were fed into an information bank which incorporates a spatial referencing system based on the Universal Transverse Mercator (UTM) grid. The one square kilometer grid cell (100 hectares) is the basic reference unit; it is the key to all data handling, processing, storage, and display. Approximately 140,000 of these cells cover New York State. Data from each 7-1/2 minute map overlay are summarized for each square kilometer cell within the quadrangle as acres, hectares, and percentages in a certain land use (of which fifty types were classified), as miles of linear features, and as counts of various point items. The computer program for retrieving this data is known as DATALIST.

Although the LUNR Inventory was developed for long-range land use planning in New York State, and has been used mainly by regional and county planning agencies, (2) it is also a potentially valuable analytical tool in agricultural geography. This paper illustrates how the LUNR system was utilized in a study of the relationship between agricultural land use patterns and the physical environment in the two western New York counties of Erie and Niagara. (3) The focus of the paper is on the methodology employed to organize land use and physical environment data into a format suitable for quantitative analysis.

## ORGANIZATION OF LAND USE DATA

Land use information for each square kilometer grid cell in the study area was obtained through the LUNR User Service at Cornell University. Grid cell data retrieved by DATALIST included the number of hectares in each of the agricultural and forest land use types classified by LUNR: orchard, vineyard, horticulture and floriculture, high intensity cropland, extensive cropland, permanent pasture, inactive agricultural land, specialty farmlands, forest brushland, natural forest, and forest plantation (Fig. 1).

Agricultural land use patterns in parts of the study area are affected by urban sprawl, especially around the Buffalo Urbanized Area, and by various forms of rural, non-farm development. An attempt was made to minimize the impact of these factors in the analysis by excluding the following grid cells from the study:

1. Cells with less than 85 hectares in the LUNR agricultural and forest land use types.
2. Cells within the corporate boundaries of a city or village.
3. Cells bordering a city corporate boundary.
4. Cells within the Buffalo and Niagara Falls suburbanizing

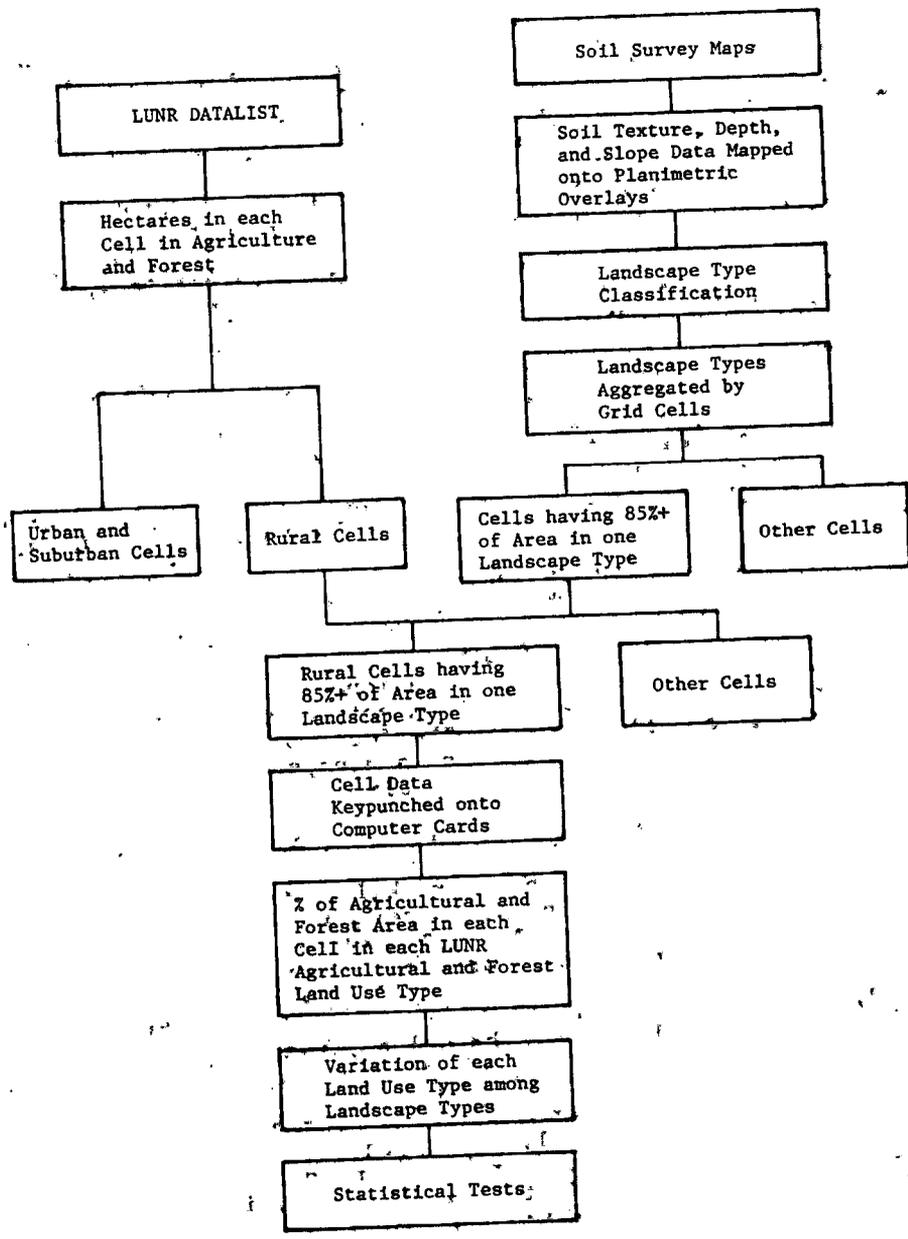


FIGURE 1. Organization of Data.

zone. (4)

Over 1,800 of the approximately 4,200 grid cells covering the study area fell into one or more of these categories. The remaining cells, of which there were 2,372, were designated as "rural". Not all of the rural cells were incorporated into the analysis, however. They had to satisfy one other criterion, to be discussed below.

#### ORGANIZATION OF PHYSICAL ENVIRONMENT DATA -

The physical environment factor was operationally defined in terms of soil texture-soil depth-slope complexes, henceforth called landscape types. Data were derived from post-1960 soil survey manuscript maps on an airphoto base (1:15,840) and accompanying soil descriptions provided by the Soil Conservation Service. Information on the geomorphic origin and texture of the soil parent material, on depth to bedrock, and on slope characteristics was transposed from the soil survey maps to transparent overlays of 7-1/2 minute New York State planimetric maps (1:24,000) (Fig. 1). The various categories exhibited by these factors were then generalized into a classification of landscape types, viz.: Level Sand, Level Clay, Level Till, Level Till over Bedrock, Level Sand over Clay, Level Clay over Sand, Sloping Till, Sloping Till over Bedrock, Sloping Sand, and Sloping Clay.

The landscape types were then aggregated by square kilometer grid cell. The first step in this procedure was to connect the tick marks spaced one kilometer apart on the margins of the planimetric maps, thereby forming a square kilometer UTM grid pattern on each map. By observing the soil texture, depth, and slope data on the transparent overlay sheets in relation to the grid cells, it became apparent which cells were occupied by which landscape type(s). Only those cells having 85 percent or more of their area in one landscape type were eligible for incorporation into the analysis.

#### INTEGRATION OF LAND USE AND PHYSICAL ENVIRONMENT DATA

A total of 739 grid cells met all of the criteria for incorporation into the analysis; i.e., they were classified as rural cells having 85 percent or more of their area given over to one landscape type. Data coded from each of these cells were recorded on computer punch cards. They included the UTM grid coordinate number of the cell, the landscape type designation, and the number of hectares in each LUNR agricultural and forest land use type. The total number of hectares in these land use types was then divided into the number of hectares in each of the respective land use types multiplied by 100, so that land use type data for each cell were expressed as a percentage of agricultural and forest area.

#### THE DATA ANALYSIS

With the data organized into the above format, the relationship between land use types and landscape types could be analyzed. The first step in the analysis consisted of determining the mean percentage of the agricultural and forest area of the grid cells comprising each landscape type given over to a specified land use type. An example of the output resulting from this computation is illustrated for orchard land use on the Outer Ontario Plain, i.e., the area within eight kilometers of the Lake Ontario shoreline. (Table 1).

TABLE 1

## PERCENTAGE OF AREA OF OUTER ONTARIO PLAIN LANDSCAPE TYPES IN ORCHARD

| Landscape Type | Orchard as % of Agricultural and Forest Area |
|----------------|--|
| Level Sand     | 59.8   |
| Level Clay     | 12.8   |
| Level Till     | 4.2  |

SOURCE: Computed by author

In the course of testing hypothesized land use/landscape type relationships, it was sometimes necessary to determine whether the mean percentage of the area of a certain landscape type given over to a specified land use was significantly greater than those of other landscape types. In the case of orchard land use (Table 1), for example, is the Level Sand mean percentage significantly greater than that of Level Clay and of Level Till? Analysis of variance could not be used as an initial test for significant differences among these mean percentages because their variances were heterogeneous. An alternative test developed by Welch (5) to overcome this type of problem was therefore applied to the orchard data. It indicated that significant differences existed within the data set at the 0.005 level of probability.

It still remained to be determined which mean percentages were significantly different from one another. Scheffe's (6) test was employed for this purpose. It indicated that the Level Sand value was significantly greater than that of either the Level Clay or the Level Till at the 0.005 level of probability. Thus, it seems quite certain that landscape type exercises a significant influence on the distribution of orchard land use within the Outer Ontario Plain. Level Sand sites within this region, compared with other site types, are preferentially devoted to orchards.

#### CONCLUSION

The employment of the LUNR Inventory as a data base in land use environment research overcomes major methodological problems encountered in previous studies. For example, spatial covariation between environmental conditions and land use was usually determined by the visual comparison of maps. LUNR permits a more sophisticated analysis because information from other sources (such as soil survey maps) can be coded to the UTM square kilometer grid, stored in numerical form in the computer, and subsequently combined or quantitatively manipulated with the land use data.

Those few studies that have in the past attempted to assess quantitatively the degree of association between land use and physical environmental conditions were constrained by data aggregated at relatively large units of observation (viz. townships or counties), thereby obscuring important variation in these conditions. The aggregation of data at the square kilometer level provides for a fine grid mesh, thus minimizing the loss of land use and environmental detail. In conclusion, the LUNR Inventory can serve as a valuable analytical tool for refining the empirical techniques necessary to assess the importance of the physical

environment in the spatial organization of agriculture.

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## CORN FARMING FOR THE FUTURE

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Corn (ZEA MAYS) is at present one of the most productive crops that has ever existed. Its modern productivity is not so much dependent on fertile soil, where fertility is kept up by careful farm management, as it is on putting chemicals into the soil. The chemicals come from mines, which means that modern agriculture has become largely dependent on resources which cannot be replaced.

In 1840, Justus von Liebig published a book in which he proposed that adding appropriate chemicals to the soil would enable plants to grow more quickly. His idea has been adopted to such an extent that modern agriculture is now largely dependent on such added chemicals. Phosphates come largely from mines in Florida and Morocco, potash from deep mines in Saskatchewan and nitrates from natural gas via the Haber process. Pesticides and herbicides are made from petroleum which is also becoming scarce. The crisis in modern agriculture and the need to design new possible futures is not caused solely by minerals which are becoming scarce. The few countries which now possess large reserves of essential minerals have suddenly realized that deriving any large monetary or developmental benefit from these resources must be done now, before the resources are all gone. Cartels to raise prices give all countries an incentive to switch over to permanently viable methods of food production while some mined resources are still available.

Using corn as an example it can be pointed out that super-productive hybrid corn has been developed because chemical fertilizers are so commonly used. Old fashioned varieties of corn, which are still grown in some parts of the world cannot make efficient use of heavy doses of nitrates, phosphates and potash. Hybrid varieties of corn have been bred to have much greater growth potential and can produce up to 200 bushels of corn per acre. Hybrid corn has also been designed to be dependent on chemical insecticides and weedicides; since new wonder chemicals are available it has not been necessary for corn breeders to worry about developing resistance to insects or competition with weeds. Because much of the corn grown at present has been bred to be dependent on chemicals which are derived from non-replaceable sources it is going to be quite difficult to design other types of corn farming, and perhaps even more difficult to persuade modern farmers with large acreages that change is possible and essential.

Richard Merrill, in an excellent chapter of a book called Radical Agriculture, which he edited, points out that about .2 percent of the organic solid waste produced each year in the United States is returned to the soil. Sewage sludge is dumped in rivers, lakes, oceans, or old mines while manure from feed-lot cattle and pigs has also become a waste disposal problem instead of a source of nutrients.(1) It seems almost incredible that much dried sewage sludge has been incinerated using natural gas, in effect using one valuable natural resource to destroy another.

It seems fairly clear that ways can be worked out to develop a type of agriculture which depends on renewable resources, but the free interplay of economic forces may not allow this to happen for some time. As fertilizers, insecticides, herbicides, gasoline and machinery increase in cost the amount of investment and working capital needed to produce a crop

on a large modern farm will continue to increase. This is one of the main reasons why banks and big corporations are taking over ownership and management of more and more farms. If high costs of operation have increased the concentration of farm ownership by agri-business, as opposed to family ownership, then it stands to reason that still higher costs will lead to still greater concentration of the agricultural industry in the hands of big business.

Bigness is not necessarily bad, but big farms, heavily dependent on gasoline, petroleum derived chemicals, natural gas, phosphates and potash are not the type of agriculture which has a very long future. The great tragedy of the coming century may be that the enormous human population which has grown up, based on nutrients taken from reserves deep in the ground, cannot be supported during the period of change over to dependence on soil fertility, recycled nutrients and small intensively worked farms.

Small farmers are often more efficient than big farmers. It is not widely realized that the efficiency of modern machine-chemical agriculture depends very largely on special definitions of the word efficient. The cost of supporting people who have been driven from the land as small farms give way to big farms is not counted when the "efficiency" of modern agriculture is measured. The extra yield produced when two or more crops are grown together in one field is not counted because the majority of modern agricultural experts have decided to measure the yield of only one crop per field. The greatest total yield is however obtained when two or more crops are grown together in a field.

To quote from an agricultural experiment at Pantnagar, India, "the total yield by monetary value of moth soybeans and corn is greater when there are two crops in the field instead of one, when little or no nitrogen fertilizer is used." (2) When no nitrogen was added the corn grown alone yielded 2,100 kg/hectare, worth 1,344 rupees. When two rows of corn were alternated with one row of soybeans the total yield was 4,088 kg/ha of corn plus 217 kg/ha of soybeans, giving a total monetary yield of 3,006 rupees. The addition of nitrogen fertilizer prevented the soybeans from fixing atmospheric nitrogen so that the addition of 150 kg/ha of nitrogen lowered soybean yields and increased corn yields to a level where corn grown alone was about equal in value to the corn-soybean mixture. It will be seen that assessing the aid which legumes can give to other crops is difficult when nitrogen fertilizer is added as a matter of course in many agricultural experiments. In the Pantnagar experiment, however, the value of legumes nitrogen fixation was compared with the addition of nitrate fertilizer, with the conclusion that one row of soybeans per two rows of corn was about equal to adding 75 kg/ha of nitrogen fertilizer. This is a very valuable conclusion for future farming. In Tanganyika varying densities of peanut plants per acre were intercropped with varying densities of maize. (3) One intercropped acre produced on the average as much as 1.54 acres of crops grown alone. Two half acres of pure stands of corn and peanuts at medium population density produced 837 pounds of corn and 299 pounds of peanuts whereas one acre of corn and peanut plants alternating within each row produced 1,218 pounds of corn plus 329 pounds of peanuts. Where corn and peanuts were planted in alternate rows the yields were 1,085 pounds of corn plus 255 pounds of peanuts per acre. These figures show how modern mechanized monocropped agriculture has reduced total yields.

An experiment in Virginia from 1951 to 1954 showed that corn plants yielded 30 percent more when corn and soybeans were planted in alternating double rows. (4) An experiment in the Punjab, India to see what could be

grown in the relatively wide spaces between the newly introduced hybrid corn plants showed that corn and soybeans together yielded an average 2,900 kg/hectare total in 1965 and 1966 as against 2,440 kg/hectare for corn grown alone. (5)

Corn is a crop which grows relatively quickly so there are perhaps two ways to consider getting extra crops from corn fields. One method would be to grow small quick growing crops between the corn plants and harvest them before the corn grow to full size. The other method, which would be used in the tropics or areas with a long growing season would be to grow crops which grow more slowly than corn and which could take over the field after the corn has been harvested.

An experiment with alternating rows of corn and sesame in central India (Madhya Pradesh) gave a 33 percent increase in monetary yield in 1969 and 47 percent increase in 1977 compared to maize grown alone. (6) In western India it was found that black gram, which is a small legume, was the best intercrop with maize. (7) Black gram increased the protein content of the maize grain, increased the yield of corn, gave a small additional crop of black gram seeds and improved the nitrogen content of the soil so much that a following crop of linseed always yielded more in a field where black gram, green gram or cowpeas had been grown than when linseed was the following crop in a field where corn had been grown alone. In tropical areas where nitrogen is quickly leached from the ground or rendered chemically inert it is more important to rely on intercropping than on crop rotation. The native peoples of tropical countries practice intercropping for this reason.

An experiment in southern India (Tamil Nadu) tested eight quick growing crops as possible useful intercrops with hybrid maize. (8) None of the vegetable (okra, radish, cowpea, cluster beans, lab lab, beet root, carrots or knol) had an effect on maize yield so the value of the vegetables can all be considered as extra yield. Okra was the most satisfactory crop since it gave an average additional 934 rupees/hectare in the summer seasons and 2,632 rupees/hectare for two monsoon seasons.

Pigeon peas are a longer lived crop than corn, ready for harvesting eight weeks after the corn harvest. An experiment in Trinidad in 1972 comparing pigeon peas and corn mixed within each row, against planting in alternate rows showed that by the date of corn harvesting (16 weeks after both were planted) pigeon peas had absorbed only 6.5 percent and 11.2 percent of the total pigeon pea potassium uptake, for mixed stand and alternate rows respectively. (9) The pigeon peas started flowering after the maize harvest; the period of maximum growth and maximum demand for nutrients did not take place at the same time, as happens when two corn plants are grown together. Total grain yields in kg/ha were 3,130 for maize alone, 1,871 for pigeon peas alone, 3,735 for mixed stand of the two crops and 4,460 for alternate rows.

The conclusion of this study of corn yields is that there are better methods of farming than "modern" farming. The decline of large scale farming as resources of petroleum, natural gas and mineral fertilizers are used up need not be a tragedy. Small scale farming where many more people work on the land and are involved in proprietary decision making will produce a society in which more people have a stake in making society work. Soil fertility can be maintained along with adequate yields as society learns to recycle nutrients and use age-old intercropping and crop rotation methods with new disease resistant hybrids. A great deal of scholarly and practical work will be needed to develop types of agriculture dependent only on resources which can be perennially renewed, but the work can be done.

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## THE GREAT AMERICAN DESERT AND NEBRASKA SETTLEMENT

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The Great American Desert concept has been discussed for decades by historians and historical geographers. Acceptance was challenged by Martyn Bowden who expressed the belief that, "The Myth of the Great American Desert as a popular image of the Western Interior before the Civil War is itself a myth." (1) This paper is an attempt to consider the desert concept's role in the settlement of a part of the Great American Desert, Nebraska.

Nebraska was known to Americans before settlement was allowed by the Kansas-Nebraska Act (1854). The Mormon and Oregon trails and the transcontinental connection by railroad were chosen by thousands of immigrants but surprisingly few people selected Nebraska for settlement. Few seemed to hold that Nebraska was a new land, a place not necessarily completely unoccupied but land suited for development and attractive as a place for a fresh start offering a chance for success.

Twenty-eight years after the Kansas-Nebraska Act, Robert Porter stated that based on the Tenth Federal Census, 1880: (2)

Consider that four-fifths of the present population of Nebraska is sparsely scattered over about one-fifth of its entire area along its eastern border. All its cities of five thousand inhabitants and upwards, and ninety-five percent of all its manufacturing interests, lie within these narrow limits; while more than four-fifths of its agricultural products have been gathered from a cultivated area, less than one-fifth of this fraction of the state, or, say, from one-twenty-fifth of the whole.

Census figures indicated that in 1880 there was a total population in Nebraska of 452,402 and a total of 63,387 farms were present. No county had more than 80 percent of its area in farms, and only four counties had more than 75 percent of their area in farms. In 1880 Nebraska remained an area available for settlement and the next five years, 1880-1885, represent the main period of the boom decade that Sheldon described as being the time of: (3)

...the largest addition to our population; the greatest increase in our production; the furthest extension of railroad mileage; the greatest change in the physical aspects of our state. More land was taken by settlers in this period, more livestock added, larger increase in crops of all kinds, more new towns were founded, more post offices were established, more...

Land availability was not enough to attract settlers. An important element in the settlement process was the area's reputation as projected to the nation and especially to potential settlers. It was the belief among settlers of either the positive or the negative publicity that served to influence the rate and direction of settlement into Nebraska. The spectacular agricultural growth of Nebraska was based on the multiple

combinations of factors that included above normal precipitation (1878-1886) accompanied by the widely publicized Aughey-Wilbur comments (1880) on climatic change. These factors came into play at a time when thousands of immigrants were seeking free and cheap land - a commodity Nebraska still contained in quantity. In the 1880's Nebraska became a popular new land and its population increased to 1,062,656 and its numbers of farms increased to 113,608 by 1890.

Early American experiences with the Great Plains region resulted in the formulation of the Great American Desert concept. Noted explorers and military men, such as Long and Pike espoused the view that the region was inhospitable, without agricultural capabilities, and even a barrier to settlement.

The detrimental effect of the desert concept on Nebraska's settlement was expressed in the 1871 Annual Report of the State Board of Agriculture: (4)

The present fertile State of Nebraska, was known only a few score of years ago, and mapped out as a portion of the Great American Desert. A decade and a half has changed all this, most marvelously, and the "American Desert" has vanished into thin air and Nebraska stands characterized for fifty millions of acres more than ordinary fertile lands.

Similarly, nearly a decade later, the first issue of the Rural Nebraska reported: (5)

An impression prevails to some extent in the Eastern States, growing out of the theory of the earlier geographers of the existence of a Great American Desert, that Nebraska is deficient in water supply and subject to frequent drought. This impression is entirely erroneous. No section of the west is more abundantly watered with streams, both large and small.

Many said that Nebraska was too dry for agriculture, others denied it, while a third group began to emphasize climatic change as a valued characteristic. The Nebraska farmer was aware of the variable nature of precipitation, seasonably and spatially. The newspapers of the period include numerous references to prospects for good crops due to good rains while the opposite was reported from another nearby place. Extremes in precipitation were also expressed when references were made to the torrential thunder storms or to the localized droughts. Dr. Childs of Platts-mouth emphasized that seasonality was important when he advised residents to remember that, "...the largest portion of our rainfall occurs during the growing season of vegetable just when it is most desirable." (6)

The thinking of many was greatly influenced by cliches such as "tillage produces rain" or "rain follows the plow." Others believed that observations, experimentation, and scientific authority did indeed prove that the climate of the plains was getting more moist on a permanent basis. Whatever the reasoning, it was based on optimism and positive thinking based on limited experience, with little use of the available data as supportive evidence.

The most prominent advocates of increasing precipitation were Professors Samuel Aughey and D.C. Wilber of the University of Nebraska, who promoted the idea that increasing precipitation could be attributed

to the environmental changes which accompanied cultivation. Aughey estimated that cultivated land could absorb three times the moisture of prairie sod; therefore, more moisture would be available for evaporation; and this moisture in turn would become the source of the atmospheric water needed to increase precipitation.

Rather than statistical evidence, Aughey relied on empirical evidence such as the replacement of vegetational forms associated with aridity by those native to moist areas, the appearance of springs in new areas, and the resumption of stream flowage in formerly dry drainage beds.

Another voice, prominent in the dispute, was the group that preferred to emphasize that trees were responsible for the increasing precipitation. Settlers brought "tree planting" to an area where Indians had used fire as a hunting tool. It was this cultural reason, rather than an environmental one, that was used to explain the grasslands, and the lower precipitation levels. A Dr. Miller at West Point, Nebraska, was quoted in the Nebraska Farmer as saying:(7)

It is largely due to the growth of young and the protection of old forests in western Iowa and eastern Nebraska in the last thirty years, that we have seen the gradual measure of rainfall in this region, and the same influence has extended the rainbelt a long reach to the westward.

Two issues earlier, the Nebraska Farmer added a third variable to explain increased precipitation:(8)

The tread and tramp of millions of livestock now herding on our western borders are contributing to future supply in that region, by bringing to the surface now dormant subterranean currents or deposits.

The optimism of the early 1880's was substantiated by the above normal precipitation recorded and published during the years from 1875 through 1886. Unfortunately, little analysis of the data sources and applications were made until after 1890. The Nebraska State Board of Agriculture published data in 1879 that were designed to give people the opportunity to compare records on rainfall in other states with that of Nebraska. (Table 1)

It is understandable how many could believe that if agriculture was possible in these eastern cities with less than fifteen inches of precipitation during the growing season, agriculture could be successful in Nebraska too--especially if precipitation was increasing. Largely ignored was the presumable fact that the record for Plattsmouth was short-term and for a period of above average precipitation, furthermore, Plattsmouth may not be representative of the entire state as it is in far southeastern Nebraska. Also forgotten were the dry years of the early 1870's.

The importance of precipitation in the minds of Nebraskans during the early 1880's is evidenced by the upheaval caused by Major Powell's report, Lands of the Arid Region published in 1879, which designated the land west of the 100th meridian as land unfit for agriculture due to the marginal character of the precipitation. This was the most recent official report that put Nebraska in an unfavorable light. The report caused an uproar in Nebraska, including a resolution adopted by the State Board of

Agriculture on January 22, 1880 stating:(9)

Resolved, that this society characterize said report as untrue, as regards the State of Nebraska, and most injurious, and made without due or competent evidence.

Resolved that we repudiate the verdict of said commission by carefully prepared statistics and proofs of the agricultural ability and fitness of farming in Nebraska west of the 100ths meridian.

Later the same year Leavitt Burnlum, Land Commissioner, took issue with the Omaha Herald for condemning all land west of Kearney to grazing and advocating legislation prohibiting occupation for other uses. The editor said:(10)

Nebraska, west of the 100th meridian, is a purely pastoral region. Agriculture can gain at best, only a precarious footing and maintain only an unsatisfactory and unprofitable existence anywhere west of Kearney Junction...All western Nebraska, all Nebraska west of the 100th meridian should be legally, as it is naturally, an infant school for beef. Eastern Nebraska will develop the animals and graduate them from corn cribs as first class meat.

In response, through his letter to the editor, Burnlum said:(11)

...as a matter of fact, the present season, one of the driest in twenty years, has shown as satisfactory results fifty and seventy-five miles west of Kearney, as the same distance east, where equally intelligent treatment of soil was bestowed.

Three years later, 1883, the Plum Creek Pioneer, as quoted in the Nebraska Farmer, proclaimed:(12)

Less than twenty years ago it was generally supposed that only those counties bordering on the Missouri in the east part of Nebraska, were fit for agricultural purposes, and those of earlier settlers who took land and opened out farms west of these counties were regarded as fool-hardy and unsure men... As the sturdy farmer takes possession of and cultivates the soil, the Great American Desert moves still further west, and soon we may look for it to entirely disappear...

Local reports from varying sources indicate that the Great American Desert concept was known in Nebraska and circulated in Nebraska's agricultural literature. Citizens of prominence clearly sought to discredit the idea. Evidence continued to mount that the concept's validity was being disproven with greater regularity. Climatic data gathered from increasing numbers of stations confirmed that great amounts of precipitation were falling. The possibility of short term abundance was not emphasized.

Prominent individuals such as Orange Judd, editor of the Prairie Farmer (Chicago) reinforced the change. He reminisced in 1885 at the Nebraska State Fair about a stop at Hastings, Nebraska, in 1879:(13)

On going out of the station I ascended the ladder

against a new frame building going up, to take a look off upon the "Great American Desert!" Why, as far as the eye could reach were golden fields, covered with thickly-standing, vigorous wheat stocks.--

This was the past. In the same address Judd continued about the future:

Today, in the cultivated counties of this state, the cornfield is greater and more frequent than it was when they were first settled. As this goes on towards your western boundaries the whole state will be in a new condition as to its rainfall and fertility.

Perception of climatic conditions in Nebraska included in acceptance that precipitation was increasing--the real concern seemed to be the acceptance of a plausible explanation that was directed towards plowing and forestation. Largely ignored as a concern was the spatial variance in precipitation and the plausibility that increases were part of a cyclical condition. Unthinkable in the early 1880's was the return of drought conditions--a part of reality that in fact returned in the early 1890's. Instead, how easy it was to believe Aughey and Wilbur when they said: (14)

...climates of the west are welcoming moisture; that rainfall is increasing steadily. The increase must extend until the plains east of Denver and Laramie receive sufficient rainfall to produce farm products without irrigation...

...evidence of present dryness, where dryness exists, is evidence only for the present, and should not be used to cover these areas with the undeserved reproach or the curse of desert lands.

For Nebraskans in the 1880's, the image of Nebraska as part of the Great American Desert had been adequately disproven, only to be largely replaced by an areal image that included increasing precipitation that accompanied the state's increasing settlement - an image that proved to be erroneous in the drought years of the 1890's.

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TABLE 1

GROWING SEASON RAINFALL  
(April to August)

| Station           | April | May  | June | July | August | Total |
|-------------------|-------|------|------|------|--------|-------|
| Plattsmouth, Neb. | 4.50  | 5.45 | 6.87 | 5.92 | 4.01   | 26.75 |
| Rochester, N.Y.   | 1.97  | 3.04 | 3.25 | 3.01 | 2.60   | 13.87 |
| Milwaukee, Wisc.  | 2.40  | 2.50 | 4.00 | 3.00 | 2.80   | 14.70 |
| Pittsburgh, Pa.   | 3.10  | 3.58 | 3.56 | 2.97 | 3.34   | 16.45 |
| Cambridge, Mass.  | 3.64  | 3.74 | 3.13 | 2.57 | 5.47   | 18.55 |

Source: Nebraska State Board of Agriculture, Annual Report 1879, p. 107.

# SPATIAL VARIATION OF COMMERCIAL BANK CAPITAL FLOWS: THE EXAMPLE OF ETHIOPIA

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John Friedmann has noted that published studies of interregional investment flows within less developed countries (LDC's) do not exist. (1) This is in sharp contrast to a number of studies examining intranational migration, interregional trade flows, the marketing systems, and the general organization of spatial economic systems within LDC's. The lack of published research that examines the spatial allocation of bank capital in less developed countries limits our understanding of an important process: capital accumulation and dispersion. The purpose of this study is to isolate several factors important in the spatial variation of commercial bank capital flows.

## THE STUDY AREA

The country chosen for this study is the East African country of Ethiopia during the period from 1964-1973. Although there were three private banks operating within the country prior to February, 1975, when all banks were nationalized, one of these, the Commercial Bank of Ethiopia handled 85 per cent of the country's banking. (2) In addition, by 1973 the Commercial Bank of Ethiopia had eighty-four branch offices, so that as an institution it was spatially distributed throughout the country. Friedmann notes that for countries in the rudimentary stage of industrialization, centripetal economic forces make it extremely difficult for investments to flow into the peripheral regions. (3) Therefore, it is hypothesized that the Commercial Bank of Ethiopia was able to acquire capital funds in the form of deposits from rural regions and then invested much of this capital in the major urban centers. If this hypothesis is correct, the rural periphery financed most of the core-area urban development in Ethiopia.

A second hypothesis is that the distance from either the primary core city of Addis Ababa, or the secondary and often competing core city of Asmara, to each of the branch offices of the Commercial Bank of Ethiopia will have a negative effect on the volume of loans. It is expected that the distance of a branch bank from the nearest of these two urban core cities is important for several reasons. First, because of primacy within the urban system and the economies of scale and agglomeration, loans are likely to be made to firms either in or very near these two cities. Second, information levels concerning investment opportunities tend to be highest in core cities where an interactive environment facilitates information flows. Information flows from the most highly developed urban areas exhibit some distance decay as they move downward through the urban system in a highly developed economy such as Sweden's. (4) In a much more poorly developed system of communication and information transfer such as the one encountered in Ethiopia, it is anticipated that information levels concerning investment opportunities will generally decrease quite rapidly with distances from these two core cities. As a result, the volume of loans reaching the periphery will be relatively small.

The third hypothesis is based on the pattern of sectoral investments made by the Commercial Bank of Ethiopia. (5) The bank's decision to extend credit primarily to industrial and commercial borrowers has a spatial dimension. It is hypothesized that most of the loans will have been made

by the commercial banking system in those towns having a sizable percentage of the labor force employed in secondary and tertiary activities. Lacking data on the value of investments in the nonagricultural sectors, the labor figures from these sectors will be used to examine the spatial expression of the bank's sectoral priorities. (6)

#### THE ANALYSIS

The loan-deposits ratio of each branch bank is used as a local index of capital allocation and will be represented as the dependent variable in a multiple regression model formulation. The loan-deposit ratio is equal to the annual dollar value of funds loaned from a branch bank divided by the annual dollar value of funds deposited in that bank. The data supplied by the Commercial Bank of Ethiopia represent only domestic capital market transactions; therefore, influxes of foreign capital did not bias the flow pattern. (7)

The first independent variable in the analysis is the population of a given town. As noted before, the regional economic development literature suggests that investments in LDC's are attracted to the largest population centers. The second independent variable is the distance from the primary core city of Addis Ababa, or the secondary core city of Asmara, to each of the branch offices of the Commercial Bank of Ethiopia. The third independent variable in the model is the percentage of a town's population employed in nonagricultural activities. A preliminary analysis of these variables indicated a skewed, log-normal distribution. To satisfy the assumption of normally distributed data required for a linear regression model, a logarithmic transformation was performed on each variable. The resultant regression equation is of the form:

$$\log L_i = \log a + b_1 \log P_i + b_2 \log D_i A + b_3 \log E_i + e \quad (\text{Eq. 1})$$

where:  $L_i$  = the loan-deposit ratio from the branch office in the  $i$ th center;  
 $P_i$  = population of the  $i$ th urban center;  
 $D_i A$  = distance from the  $i$ th urban center to the Addis Ababa or Asmara core region;  
 $E_i$  = percentage of population in  $i$ th urban center employed in nonagricultural activities.

An examination of the residuals from the regression equation indicated a consistent overestimation of the loan-deposit ratio in towns north of Addis Ababa and underestimated in towns south of Addis Ababa. This north-south difference in economic development confirms a pattern observed by other writers. (8) To test the significance of the north-south difference in economic development a dummy variable was added to the regression equation. This nominal variable (N) indicates if a town is located north or south of Addis Ababa. The modified model is of the form:

$$\log L_i = \log a + b_1 \log P_i + b_2 \log D_i A + b_3 \log E_i + b_4 N + e \quad (\text{Eq. 2})$$

The results of the analysis using the second equation are presented in Table 1 for the years: 1964, 1970, 1973.

Several important observations can be made concerning the results of the model. According to the standardized partial regression coefficients, all four independent variables make statistically significant contributions to the overall explained variance. In addition, an examination of the signs associated with each  $\beta$  value indicates that each of the independent vari-

ables is related to the dependent variable in the hypothesized direction.

TABLE 1.  
RESULTS OF THE REGRESSION MODEL

| Variables<br>(1964) | Standard Partial<br>Regression<br>Coefficient ( $\beta$ ) | Standard Error<br>of Regression<br>Coefficient | Multiple Coef-<br>ficient of Deter-<br>mination (R <sup>2</sup> ) |
|---------------------|---|--|---|
| P                   | .5961*  | .0543  | .6323   |
| D <sub>A</sub>      | -.4278  | .0479  | .6686   |
| E                   | .3216   | .0771  | .7210   |
| N                   | .2948   | .0664  | .7946   |
| <hr/>               |   |  |   |
| Variables<br>(1970) |   |  |   |
| P                   | .5237   | .0473  | .6041   |
| D <sub>A</sub>      | -.6189  | .0418  | .6923   |
| E                   | .3780   | .0627  | .8050   |
| N                   | .3960   | .0762  | .8486   |
| <hr/>               |   |  |   |
| Variables<br>(1973) |   |  |   |
| P                   | .3513   | .0434  | .5791   |
| D <sub>A</sub>      | -.5984  | .0561  | .6514   |
| E                   | .4318   | .0383  | .8386   |
| N                   | .4829   | .0719  | .8890   |

\*All values significant at the .01 level.

SOURCE: Computed by author.

The values for the multiple coefficient of determination (R<sup>2</sup>) illustrate that population of a town was the single most important variable in explaining the magnitude of the loan-deposit ratio. However, the importance of population to the model decreased throughout the period under study as the Commercial Bank of Ethiopia opened more branch offices in smaller towns. Also, the amount of overall explanation that the level of nonagricultural employment contributes to the model increases through time.(9)

#### CONCLUSIONS

The multiple regression model supports the three hypotheses concerning the variables important in determining the size of the loan-deposit ratio of a given branch bank. Population and distance of a branch bank from either Addis Ababa or Asmara are important in accounting for variance

in the loan-deposit ratio, a confirmation of the first two hypotheses. In addition, the third hypothesis that the amount the bank loans with respect to deposits in a given town will be positively correlated with the level of nonagricultural employment in the town was confirmed. Finally, the inclusion of a dummy variable to indicate the regional difference in levels of development between northern and southern towns increases the overall performance of the model. Today the splintering in Ethiopia by various groups in the periphery appear related to past political and economic centralization policies of the Haile Selassie government.

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## MIGRANT WORKERS IN WESTERN EUROPE: CHANGED PERSPECTIVES

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The migrant worker, or *Gastarbeiter* (guest worker), boom in Northwestern Europe in the late 1950's, accelerated in the 1960's, and peaked in the early 1970's. This paper analyzes the current status of the migrant worker phenomenon, some of its principal effects on the host countries, and the changing attitudes and policies of these countries regarding foreign workers.

The importance of foreign workers in the industrialized European Community (EC) is often not appreciated. First, in the labor-short years of rapid economic expansion they provided a vital, cheap, flexible supplement to the work force. Second, they take low-pay and often unpleasant jobs which host country nationals have become increasingly loathe to accept. Finally, their large numbers and relative permanence insure that they are a minority which cannot be overlooked. West Germany and France today each have about two million foreign workers who constitute 8% and 9% respectively of their total work force. The EC as a whole has in 1977 some 6,000,000 immigrant workers plus an estimated 600,000 illegal migrant workers.

Changing economic conditions since the early 1970's and their attendant social concerns focus attention on three recent trends. Foremost among these has been the stemming of new immigration and, indeed, a considerable repatriation of resident foreign workers from northwestern Europe. Though there is free migration of labor within the nine-member EC now, immigration from third countries has been essentially halted. France and West Germany, for instance, have had their borders closed to third-country immigrants since 1973. West Germany's peak migrant worker population of 2,600,000 in the latter year has dwindled by nearly 25% to about 2,000,000 in 1977. The International Labor Organization (1) estimates that 2,000,000 migrant workers in northwestern Europe have lost their old jobs since late 1973 and that most of them have gone home. This repatriation poses a major problem for Yugoslavia, Turkey, Spain, Portugal and Italy, all with serious unemployment themselves.

In more recent years a second trend is discernible in the slower turnover within the migrant worker population. Fewer workers have come for one- or two-year stints. A related aspect is the larger number of family members, i.e. non-workers, residing in the host countries. Thus the migrant worker population has become more permanent and characterized by a larger number of dependents. In West Germany in 1974 nearly two-thirds of the foreign workers had spouses with them. In the EC in 1973 the total migrant population of roughly 10,000,000 included more than 2,000,000 children.

A final trend, evidenced over a somewhat longer period, concerns the changing and increasingly varied ethnic make-up of migrant workers in northwestern Europe. As the tide of labor migration, especially that directed toward the EC, rose, the areas of origin shifted and widened. As late as 1959, three-fourths of all migrant workers in the EC of six came from member states of the Community, largely from Italy. By 1973, the proportions had been reversed. Three-fourths of the alien workers in the newly expanded Community of nine came from non-member states. The number of intra-Community migrants had not decreased, however. The proportionate

ethnic shift simply reflected the rapid increase in the total alien work force and implied insufficient availability of migrant workers from within the EC.

As the total of non-EC workers grew, a number of spatial and political factors influenced the migratory stream between donor and host countries. Italy, for example, most proximate to the industrialized north of Europe, was initially the outstanding donor. In the early 1960's Spain and Yugoslavia, and then later Greece and Portugal, contributed ever larger numbers of migrants. In the late 60's and early 70's workers were drawn from still more distant places: Turkey, North Africa, and even some from sub-Saharan Africa and East Asia. So long as the economies of northwestern Europe expanded, the migratory volume expanded with it. Although the number of Italian migrants did not diminish, their relative proportion declined.

These migratory streams developed along spatially distinct channels. As the migratory volume expanded and diversified, the distance between donor and host countries, as well as the political and/or cultural connections between them began to play an increasingly significant role. Table 1 makes clear that West Germany and France, the recipients of about two-thirds of all EC immigrant workers, draw their foreign work force from quite different labor-surplus regions:

TABLE 1

|                     | Turkey   | Yugoslavia | Italy   | Greece  | Spain   | Other   |
|---------------------|----------|------------|---------|---------|---------|---------|
| West Germany (1976) | 560,000  | 420,000    | 280,000 | 200,000 | 120,000 | 450,000 |
|                     | Portugal | Algeria    | Spain   | Italy   | Morocco | Other   |
| France (1975)       | 430,000  | 400,000    | 270,000 | 200,000 | 170,000 | 430,000 |

The importance of Turks, Yugoslavs, and Greeks has been primarily to West Germany, whereas France has relied mainly on Portugal, Algeria and Spain for workers. This difference is accounted for in large measure by the relative spatial proximity between donor and host countries. In addition, historic and present political connections as well as cultural affinity continue to play a major role in the development of migration flows. France's former political hegemony over and continuing cultural and linguistic influence on the Maghreb have certainly contributed powerfully to the preponderance of that region's workers in France. And the presence of one-half million Irish workers in the United Kingdom further attests to the effect of spatial proximity on these migration patterns.

The impact of foreign workers underwent a dramatic shift, from a highly positive phenomenon to a serious liability in the early 1970's. This shift was occasioned by the worldwide recession and the recognition that the temporary migratory movement had in many instances become a permanent resettlement.

Particularly worrisome, as recession drags into a slow and hesitant recovery plagued by "stagflation", is the stubbornly persistent high rate of unemployment. The seemingly intractable nature of this problem is now

admitted, as is evidenced by the increasing tendency to describe unemployment in the rich countries as "structural", i.e. permanent, or at least long range, rather than "cyclical" or temporary.

The unemployment rate in European countries which are members of the Organization for Economic Co-operation and Development (OECD) is expected to climb, in fact, from 4.25% in 1976 to 4.75% in 1977. The burden falls especially hard on the young, poor and minority groups, which already have higher crime rates and politically troublesome histories. One-third of the 5,500,000 unemployed in the EC in January, 1977 were under 25, a rate twice as high as for the work force as a whole. Data from the United Kingdom indicates that the rise in unemployment between 1973 and 1975 was more than two times as steep for the foreign workers as for the total labor force. It is no wonder then that government policies are geared today toward repatriation of migrant workers.

A second problem, related to the high unemployment rates, is the increasing size and permanence of minority groups. In recent years, latent racial and class prejudices have surfaced and complicated societal harmony and stability. In Switzerland three referenda in as many years have tackled the issue of limiting the resident foreign population. The extensive problems associated with the repatriation, integration or assimilation of foreign workers and their families have only lately been given the attention they deserve.

The large and highly concentrated foreign populations have had an especially harsh impact on already crowded large urban areas. The concentration of these minorities in bidon-villes and ghettos has led to many very serious social and physical conflicts. The permanent migrant and his family place a greater demand on the host societies' social capital than did the single, temporary migrant of a decade earlier. The need for more and better housing, health, educational and social welfare services is now thought to entail costs greater than the benefits supplied by foreign manpower.

Moreover, the concentration of population and industrial activity has led to an even greater regional imbalance in the host countries. To satisfy the needs of an ever larger population in already developed regions these countries have had to siphon development funds away from their underdeveloped areas. Meanwhile, the peripheral zones of donor countries have suffered the loss of their most dynamic population. As a result, the poorer regions of both host and donor countries have indirectly subsidized the richer, already developed regions.

A number of EC policies are attempting to deal positively with the above-mentioned problems. Foremost is the nearly total ban on further immigration, mentioned earlier. Secondly, also previously cited, repatriation has been encouraged, and the reverse flow has already been sizable. France is currently offering a \$2,000 bonus to workers who agree to return to their home countries permanently. Also in the past few months a serious effort has been initiated to curb illegal immigration. Furthermore, a policy aimed at attacking the root causes of emigration is being generally followed through various EC economic and trade agreements and concessions, aid programs and the like, mostly with Mediterranean countries which have been the chief donors of labor.

In all fairness, it must be stated that EC governments have instituted many-faceted programs aimed at helping semi-permanent and permanent foreign workers improve their economic and social conditions and even, more recently, political rights. These are generally in a framework directed

toward greater assimilation within the host country's society, and in many cases they have attained a substantial measure of success. (2)

In conclusion, we should like to emphasize two points regarding the industrialized northwestern European countries: 1) the importance and complexity of the migrant worker problems and 2) the difficulty, but urgency of addressing their repercussions effectively with practical, high priority programs. Obviously, this is a subject which merits further investigation. Moreover, the related issues, largely ignored here, of the effects of emigration and repatriation on the donor countries and on the individual migrants themselves--especially the non-monetary ones--need elaboration. These interesting aspects of the European migrant worker phenomenon will be examined in a follow-up study by the authors.

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## FOREIGN OWNED MANUFACTURING ESTABLISHMENTS IN NEW YORK STATE

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In recent years, there has been considerable publicity about the flight of business from the northeastern United States, particularly New York State. There has been much less publicity about another flow that is occurring, namely the movement of foreign capital into the United States and the commencing of United States' operations by non-American owned enterprises. Although there are no precise records kept of the ownership of American establishments by foreign individuals or corporations, the United States Department of Commerce and the Conference Board, an independent research organization, attempt to keep track of the investments and ownership by foreigners in American business and probably achieve a high, if not perfect, level of accuracy. The data for this paper come from a recent publication of the Department of Commerce (1) and a survey of foreign ownership published by Arpen and Ricks in 1975(2), plus information culled from articles(3), newspapers, and other sources.

Studies of the location of manufacturing activity can generally be placed into one of two categories: the macro, or theoretical, approach, represented by the works of Weber, Losch, Isard, and others; and the micro, or empirical, approach taken by Hunker(4), Krumme(5), and others. Looking at the United States as a whole, the macro, or theoretical, approach will probably explain the location of foreign manufacturers in the country. The traditionally industrial northeastern area is the site of a large percentage of foreign owned operations, with New Jersey, New York, and Pennsylvania leading the nation in that order. In fact, the foreign entrepreneurs do not seem to be as discouraged with the northeastern United States as are American managers since, as late as 1976, New York State was the chosen location for more new direct investments than any other state. This may change in the future as the number of investments in the South and West seems to be increasing very rapidly. The southern states, in particular, are making every effort to create a favorable investment climate for foreign manufacturers.

On an intra-state level, however, the micro, or empirical method of study seems better able to explain the distribution of foreign owned manufacturing. One can at least hypothesize that foreign manufacturers have different location criteria for their establishments, simply because they are foreign. Not being an integral part of the American business community, their goals, and certainly their sources of information, may be quite different from the United States businessman. Thus, although one study(6) has determined that the order of major factors affecting the location decision of foreign manufacturers is: first, proximity to markets; second, transportation facilities; third, labor factors; and fourth, tax consideration, other studies(7) have found that inexpensive labor and state or local incentive packages rank the highest. Although these are not necessarily contradictory findings, they at least indicate the problem of trying to analyze the decision-making activities of persons who may not be thinking along the same lines that their American counterparts do.

The foreign manufacturer is, by definition, an outsider. Although he may be sought after and wooed by governments as a potential provider

of employment and tax revenues, he also faces not only the normal competitive forces that all American businessmen face, but some additional handicaps as well. The question of scale of operation, for instance, may be answered quite differently by a foreign manufacturer than by a domestic one. How large can a foreign manufacturing operation become before it begins to attract unfavorable attention from the somewhat nationalistic American population? This question, the answer to which is unknown, will certainly affect the consideration of economies of scale and agglomeration economies. On the one hand, increased size may lead to lower production costs, through economies of scale, but, on the other hand, large size could result in accusations of "draining profits from the country".

Does the foreign manufacturer want to enter fully into the rough and tumble life of the American business community, or would he rather stay off in the corner a little, "doing his own thing", but not actively participating in the business life of the country? It is interesting to note that the great majority of foreign organizations adopt a different corporate name for their United States operations. Perhaps this is just a matter of language; it may be easier for Americans to say "Auburn Steel Company" than "Kyoei Steel" or "Peter Cooper Corporation" than "Rousselot, S.A.", but it may also be a matter of attracting less attention with an "Americanized" name. This same attitude can possibly apply to location-- a marginal location, on the fringes of business activity, may be preferred over a central, but more visible, site.

Is there a desire on the part of foreign manufacturers to stay in an area with others of their own nationality? Americans are notorious for establishing "colonies" or outposts of America, in the countries in which they may be living. Do foreign businessmen, even if they do not constitute a large proportion of their enterprises' employment, have the same tendency?

These, and other, personal factors may well play a more important role in the decision as to where to locate a foreign owned manufacturing operation than the macro factors of markets, transportation, labor, etc. Obviously, the personal factor that Hunker and others have found to account for the greatest percentage of factory locations, "residence of the owner", does not apply to foreign entrepreneurs. But there may well be other influences, not felt by the American businessman, but which are unique to the foreign operator, that enter into his location decision making. In the remainder of this paper the distribution of foreign owned manufacturing establishments in New York State will be used to explore these questions.

Map 1 shows the distribution, by county, of the 334 foreign owned manufacturing establishments in New York State that have been found on one or more of the lists available. At first glance, it may not be too surprising--New York City metropolitan area has a large number of establishments, with New York and Nassau counties leading the list. Similarly, the Niagara Frontier, with Erie County in third rank in the state is not unexpected in its importance. But, on further examination, one notes the large number of foreign owned establishments in Niagara, Clinton, and Franklin counties, and a relatively low number in such industrialized counties as Monroe and Onondaga. If we convert these raw distribution figures into Location Quotients, by the following formula as found in Alexander (8):

$$\frac{\text{Number of foreign owned manufacturing establishments in a county}}{\text{Total manufacturing establishments in a county}}$$

$$\frac{\text{Total foreign owned manufacturing establishments in New York}}{\text{Total manufacturing establishments in New York State}}$$



and map the resulting values, we come up with Map 2. In this map, Clinton, Genesee, St. Lawrence, Niagara, Franklin, and Schuyler counties are the leaders, in that order. Although Nassau, Suffolk, and Westchester counties all have values above one, indicating that they have a higher concentration of foreign owned establishments than the state as a whole, their values are well below the previously listed counties. The inner part of metropolitan New York City, Kings, Queens, Bronx, and New York counties, all have values well below one.

From a perusal of Map 2, one could assume that foreign manufacturers, much more than their American associates, prefer more remote, out of the way locations. In addition to the six high ranking counties already mentioned, Orleans, Wyoming, Oswego, Jefferson, and Lewis all have values indicating a high concentration of foreign manufacturing within their boundaries. None of these counties would normally be thought of as being in the industrial heart of New York State.

Since Maps 1 and 2 deal with all foreign owned manufacturing establishments in New York State, and we earlier asked the question whether or not there is variation among the locations preferred by different national groups, let us turn to Map 3. We do not have maps showing the locations for every national group. Maps of British and Dutch locations would, however, show a fairly wide and even distribution across the state. In the case of West German locations, however, there is a decided concentration. Of the thirty-six West German owned manufacturing establishments in New York State, thirty-two are located in the greater New York City area. Only Monroe, Oswego, and Ulster counties are outliers from the concentration of German ownership in and around New York City. Nassau is the leading county, with twelve, or one third, of the German manufacturing plants. Map 3 raises more questions than it answers. What are the factors behind this great concentration of German manufacturing establishments in the southeastern part of the state, whereas British and Dutch ownership is much more widely distributed? Is this a case of "psychological agglomeration"? Blackburn quotes this as "de Smidt's term for the tendency for foreign companies to form national industrial 'ghettos' once the links with companies in the homeland are transferred to foreign subsidiaries." (9)

A major component in the distribution shown in Maps 1 and 2 can be seen by an examination of Map 4, the distribution of Canadian owned manufacturing establishments in New York. Canadian manufacturers are, of course, somewhat unique in the category of "foreign" owners, since they are the only ones that share a common boundary with New York State and the United States. Thus, although they are legally foreign, perhaps they are a little less foreign than the Germans, British, French, etc. That the Canadians not only share a boundary with New York State, but that they like to stay close to that boundary when locating manufacturing plants in the States is obvious from Map 4. Erie, Clinton, and Niagara counties, all boundary counties, contain fifty-eight, or almost one-half, of the 123 Canadian owned manufacturing establishments in New York State. If one adds to this list St. Lawrence County, a border county but fifth ranked, one raises the total to sixty-seven, or over one-half. And if one adds Genesee County, fourth ranked but one county away from the boundary, and the seventh ranked boundary county of Jefferson, one has a total of eighty-two, or exactly two thirds, of all Canadian manufacturing establishments in the state. This certainly does not correspond to the distribution of American firms in Europe. Blackburn, speaking of American firms in Europe, says, "...there is an obvious preference for major manufacturing regions, a tendency which seems stronger among American-owned than among either locally-owned or other foreign



firms." (10) Although there are many similarities between this distribution and that found by Ray (11) for American factories in Canada, there are also obvious dissimilarities. American firms locating near Toronto or in southeastern Ontario were locating in an area of high market potential. St. Lawrence, Franklin, and Clinton counties are hardly the market potential peaks of New York State. On the other hand, Ray's concept of "economic shadow" may well apply here. Further analysis of the distribution of Canadian owned firms, by ownership location and industry type will be required before that is known. Similarly, the effect of corporate organization and inter-plant linkages will have to be examined, as Britton (12) studied American plants in Canada.

Questions tumble out of Map 4. What are the markets served by these establishments? Is there a sense of "security" in locating close to the border? If Canadian markets are being served, what advantages--labor, raw materials, taxes, etc.--are great enough to overcome tariff disadvantages? If United States markets are being served, are these the optimum locations to serve the United States, or are they "secure" locations?

This paper has tried to inject another element into the study of manufacturing location in the United States--the element of being foreign owned. Although foreign owned establishments may not loom very large in the total United States manufacturing picture, for some areas, such as the southern states that are actively seeking such investments, or for the border communities of Upper New York State, the presence of foreign owned plants may make a considerable difference to the economic health of the community. What are the factors that influence the location of foreign owned manufacturing establishments in the United States?

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## THE NEW YORK CITY FISCAL CRISIS: WILL IT OCCUR ELSEWHERE?

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When New York City, the largest city in the country, faced a serious fiscal crisis in 1975, one question of prime concern was whether other cities would follow suit. It was feared that this situation was only a forerunner of a series of fiscal disasters which might take place in cities throughout the country.

New York City was unable to borrow money at any interest rate. The banks had decided that they did not like the City's fiscal practices and refused to extend credit. Since the City depended on a constant rollover of debt to support its expenditures, it was for all purposes unable either to pay for services provided or to repay its debtors. In response to this crisis, the Municipal Assistance Corporation was established. This agency was to be independent of the City and would float its own bonds; however, it met with difficulty almost immediately. The City was then forced to relinquish its fiscal powers to the State government in the form of the Emergency Financial Control Board. Still facing the possibility of bankruptcy, New York City convinced the federal government to give it a seasonal line of credit of \$2.2 billion for the next three years. The City agreed to repay the loan with interest each year and to have a balanced budget for the fiscal year 1978.

Since 1975, New York City, along with other cities in the nation, has had additional fiscal difficulties but has escaped default. As a consequence, though, municipal bonds in general have been considered riskier investments than previously; the availability of funds to cities has declined while the interest rate that cities must pay has increased.

This turn of events leads to several interesting questions: 1) why New York City was hit with the crisis in the first place; 2) how these problems manifested themselves in the City's finances; 3) whether similar fiscal conditions existed in other cities; 4) whether these conditions were spatially or functionally correlated--i.e., are cities in fiscal trouble located in one part of the country or are their economies based on similar activities; and 5) why New York City was faced with near default while other cities with similar fiscal characteristics have not faced that problem.

This paper will try to answer these questions by examining the 1975 finances of the 25 largest cities in the United States; the source of data is City Government Finances in 1974-5 from the United States Bureau of the Census. (1) The specific components to be examined are total revenues, including local tax collections and intergovernmental revenues; total expenditures including capital outlay and public welfare expenditures; and total outstanding gross debt, including total borrowing for the year. The types and amounts of revenues and expenditures are important in understanding the cities' fiscal health. For example, high capital expenditures and heavy dependence on tax collections (measured as a percentage of all general revenues) are probably indicative of a growing city with faith in its future and the income necessary to supply its citizens with services. Another sign of a city's health is the relative growth or decline of its tax base, as reflected in its population.

The employment structure will be used to compare the economies of

the cities. Figures for each city's whole Standard Metropolitan Statistical Area will be examined since a city's economy is very much intertwined with that of its surrounding area. (2).

#### WHY NEW YORK CITY WAS HIT WITH THE FISCAL CRISIS

The New York City fiscal crisis or "its inability to borrow money at any price through the issuance of bonds or notes in the tax exempt bond market" (3) occurred because the City had not tried to "keep expenditure growth in line with tax receipts." Various fiscal "gimmicks" were used which kept New York City solvent in the short run but resulted in great difficulties in the long run. For example, the capital budget, funded by long term borrowing, was used to finance current operating expenditures and short term borrowing financed deficits "in anticipation of revenues that did not exist." (4) The market had lost confidence in the City's ability to repay its debts because the City's revenues were not growing accordingly.

The fiscal problems were a function of several underlying factors including the loss of many taxpayers to suburban areas for a variety of reasons. These involved the desire to escape the racial and educational problems of living in the city as well as reaping the esthetic, psychological, and financial benefits of owning a house and land.

In addition, New York City granted its unionized employees extremely generous wages, pensions, and other fringe benefits. The City also greatly increased the number of its public employees.

#### MANIFESTATIONS OF NEW YORK CITY'S FISCAL PROBLEMS IN THE DATA

The fiscal problems of New York City were reflected in its levels and types of revenues, expenditures, and debt. New York City was collecting very large amounts of total and per capita revenues and taxes (Tables I and II). Yet taxes formed a rather small percentage of all general revenues (34) indicating that its tax base was not sufficient to support its expenditures. New York City, therefore, depended on other revenue sources, primarily inter-governmental revenues, for over one-half of its general revenues. Moreover it had an outstanding gross debt of \$15 billion (\$1,934 per capita), of which \$2 billion (\$285 per capita) was borrowed in fiscal year 1974-5. The total borrowing for 1974-5 represented 15 percent of its total revenues (Table III):

In comparison with the 24 next largest cities in the country, New York City ranked highest in terms of both total and per capita revenues collected, total borrowing and gross debt outstanding (Tables I and III). Yet it ranked eighth when total borrowing was compared with total revenue. Hence, there were cities that were borrowing larger proportionate amounts in relation to their total revenues implying that they might have been in a precarious fiscal position.

#### CITIES WITH A GREATER BORROWING REVENUE RATIO

The seven cities in which the percentage of their total revenues supplemented by total borrowing was greater than New York City were San Antonio, Cleveland, Houston, San Jose, Washington, D.C., Philadelphia, and Phoenix. Four of these, San Antonio, Houston, San Jose, and Phoenix are in the Southwest--generally considered a growing part of the country; Washington, D.C., Philadelphia, and New York are in the troubled Northeast; Cleveland is in the northern industrial belt. Although their debt patterns were similar, their population growth and revenue and expenditure patterns depicted two different situations: 1) comparatively well-off southwest

TABLE I

THE POPULATION, TOTAL REVENUES AND TOTAL EXPENDITURES  
OF THE 25 LARGEST CITIES IN THE  
UNITED STATES: 1974-5<sup>a</sup>

| City                     | Popula-<br>tion <sup>b</sup> | Total Revenues   |      |                 | Total Expenditures |            |                 |      |    |
|--------------------------|------------------------------|------------------|------|-----------------|--------------------|------------|-----------------|------|----|
|                          |                              | Total<br>(000's) | Rank | Per<br>cap Rank | (000's)            | Rank       | Per<br>cap Rank |      |    |
| NYC                      | 7,646,818                    | 14,231,572       | 1    | 1861            | 1                  | 11,641,287 | 1               | 1836 | 2  |
| Chicago                  | 3,172,929                    | 1,276,600        | 3    | 402             | 15                 | 1,126,408  | 4               | 335  | 18 |
| Los Angeles              | 2,746,854                    | 1,547,887        | 2    | 564             | 9                  | 1,472,482  | 3               | 536  | 11 |
| Phila. <sup>c</sup>      | 1,861,719                    | 960,857          | 6    | 516             | 11                 | 1,027,921  | 5               | 552  | 10 |
| Detroit                  | 1,386,817                    | 829,245          | 7    | 598             | 8                  | 803,860    | 7               | 580  | 9  |
| Houston <sup>c</sup>     | 1,320,018                    | 378,303          | 11   | 287             | 24                 | 369,468    | 12              | 280  | 24 |
| Baltimore                | 877,838                      | 1,046,189        | 5    | 1192            | 3                  | 967,288    | 6               | 1102 | 4  |
| Dallas                   | 815,866                      | 297,633          | 14   | 365             | 18                 | 306,166    | 15              | 375  | 17 |
| San Diego                | 757,148                      | 229,189          | 22   | 303             | 22                 | 224,563    | 22              | 297  | 23 |
| San Antonio <sup>c</sup> | 756,226                      | 301,347          | 13   | 398             | 17                 | 357,272    | 13              | 472  | 13 |
| Wash., D.C. <sup>c</sup> | 733,801                      | 1,234,174        | 4    | 1682            | 2                  | 1,508,411  | 2               | 2056 | 1  |
| Indianapolis             | 728,344                      | 238,381          | 19   | 327             | 21                 | 241,271    | 19              | 331  | 20 |
| Milwaukee                | 690,685                      | 294,078          | 16   | 426             | 14                 | 228,223    | 21              | 330  | 21 |
| San Francisco            | 687,450                      | 765,321          | 8    | 1113            | 4                  | 731,655    | 8               | 1064 | 5  |
| Honolulu <sup>c</sup>    | 685,717                      | 231,856          | 20   | 338             | 19                 | 239,590    | 20              | 349  | 19 |
| Cleveland <sup>c</sup>   | 678,615                      | 296,922          | 15   | 438             | 13                 | 326,122    | 14              | 481  | 12 |
| Memphis                  | 658,868                      | 495,077          | 10   | 751             | 6                  | 517,090    | 10              | 785  | 6  |
| Phoenix <sup>c</sup>     | 637,121                      | 208,291          | 23   | 327             | 20                 | 247,587    | 18              | 389  | 15 |
| Boston                   | 618,275                      | 665,451          | 9    | 1076            | 5                  | 726,654    | 9               | 1175 | 3  |
| New Orleans              | 573,479                      | 229,819          | 21   | 401             | 16                 | 197,409    | 23              | 381  | 16 |
| St. Louis                | 558,006                      | 279,578          | 17   | 501             | 12                 | 248,869    | 17              | 446  | 14 |
| Columbus                 | 540,933                      | 163,291          | 24   | 302             | 23                 | 169,136    | 24              | 313  | 22 |
| San Jose <sup>c</sup>    | 523,116                      | 134,559          | 25   | 257             | 25                 | 123,597    | 25              | 236  | 25 |
| Jacksonville             | 521,953                      | 349,312          | 12   | 669             | 7                  | 394,237    | 11              | 755  | 7  |
| Seattle                  | 503,073                      | 275,276          | 18   | 547             | 10                 | 298,798    | 16              | 594  | 8  |

<sup>a</sup>Calculated from U.S. Department of Commerce, Bureau of the Census, City Government Finances in 1974-75, Washington, D.C.: U.S. Government Printing Office, 1976.

<sup>b</sup>Population figures are 1973 estimates used in City Government Finances in 1974-5.

<sup>c</sup>Cities whose Total Borrowing:Total Revenue Ratios were greater than that of New York City

TABLE II  
 SELECTED GENERAL REVENUES OF THE 25 LARGEST CITIES IN THE UNITED STATES: 1974-5<sup>a</sup>

|                           | General Revenues |      |         |      |           | Taxes         |      |         |      |         | Intergovernmental Revenues |      |         |      |         |
|---------------------------|------------------|------|---------|------|-----------|---------------|------|---------|------|---------|----------------------------|------|---------|------|---------|
|                           | Total (000's)    | Rank | Per cap | Rank | Per cap   | Total (000's) | Rank | Per cap | Rank | Per cap | Total                      | Rank | Per cap | Rank | Per cap |
| NYC                       | 12,763,879       | 1    | 1669    | 1    | 4,852,702 | 1             | 635  | 2       | 38   | 19      | 6,699,536                  | 1    | 876     | 1    | 53      |
| Chicago                   | 1,080,795        | 3    | 341     | 4    | 595,146   | 2             | 189  | 9       | 56   | 4       | 338,878                    | 4    | 107     | 16   | 31      |
| Los Angeles               | 933,281          | 5    | 340     | 15   | 479,899   | 4             | 175  | 12      | 51   | 7       | 231,768                    | 8    | 84      | 18   | 25      |
| Philadelphia <sup>c</sup> | 895,123          | 6    | 481     | 7    | 451,278   | 5             | 242  | 7       | 50   | 8       | 289,168                    | 6    | 155     | 9    | 32      |
| Detroit                   | 687,341          | 8    | 496     | 6    | 287,944   | 7             | 208  | 8       | 42   | 12      | 292,371                    | 5    | 211     | 7    | 43      |
| Houston <sup>c</sup>      | 315,172          | 10   | 239     | 24   | 180,784   | 10            | 137  | 15      | 57   | 2       | 50,575                     | 21   | 38      | 25   | 16      |
| Baltimore                 | 989,866          | 4    | 1128    | 3    | 256,281   | 9             | 303  | 5       | 27   | 24      | 635,241                    | 2    | 724     | 3    | 38      |
| Dallas                    | 222,754          | 16   | 273     | 20   | 143,909   | 11            | 176  | 11      | 65   | 1       | 34,714                     | 25   | 39      | 24   | 14      |
| San Diego                 | 182,372          | 20   | 241     | 23   | 75,764    | 19            | 100  | 23      | 42   | 14      | 63,560                     | 18   | 84      | 19   | 35      |
| San Antonio <sup>c</sup>  | 124,888          | 24   | 165     | 25   | 50,523    | 25            | 67   | 25      | 41   | 16      | 36,942                     | 24   | 49      | 23   | 30      |
| Wash., D.C. <sup>c</sup>  | 1,179,939        | 2    | 1608    | 2    | 543,594   | 3             | 741  | 1       | 46   | 9       | 571,384                    | 3    | 779     | 2    | 48      |
| Indianapolis              | 237,701          | 14   | 326     | 17   | 87,731    | 15            | 120  | 17      | 37   | 21      | 101,949                    | 12   | 140     | 10   | 43      |
| Milwaukee                 | 248,383          | 13   | 360     | 12   | 79,790    | 17            | 116  | 19      | 32   | 22      | 124,326                    | 11   | 180     | 8    | 50      |
| San Francisco             | 765,321          | 7    | 946     | 5    | 266,985   | 10            | 388  | 4       | 41   | 15      | 224,381                    | 7    | 328     | 5    | 35      |
| Honolulu                  | 215,285          | 17   | 314     | 18   | 122,034   | 13            | 178  | 10      | 57   | 3       | 55,275                     | 19   | 81      | 20   | 26      |
| Cleveland <sup>c</sup>    | 227,598          | 15   | 336     | 16   | 90,821    | 14            | 134  | 16      | 40   | 17      | 79,683                     | 13   | 117     | 15   | 35      |
| Memphis                   | 296,822          | 11   | 499     | 9    | 72,478    | 20            | 110  | 20      | 24   | 25      | 174,507                    | 10   | 265     | 6    | 59      |
| Phoenix <sup>c</sup>      | 179,912          | 22   | 282     | 19   | 67,304    | 21            | 106  | 21      | 37   | 20      | 75,206                     | 15   | 118     | 14   | 42      |
| Boston                    | 622,059          | 9    | 1006    | 4    | 328,745   | 6             | 532  | 3       | 53   | 6       | 210,993                    | 9    | 341     | 4    | 34      |
| New Orleans               | 214,162          | 18   | 373     | 10   | 82,897    | 16            | 145  | 14      | 39   | 18      | 79,403                     | 14   | 138     | 11   | 37      |
| St. Louis                 | 254,019          | 12   | 455     | 8    | 140,227   | 12            | 251  | 6       | 55   | 5       | 73,392                     | 16   | 132     | 12   | 29      |
| Columbus                  | 141,387          | 23   | 261     | 21   | 62,496    | 22            | 116  | 18      | 44   | 10      | 39,618                     | 22   | 73      | 21   | 28      |
| San Jose <sup>c</sup>     | 127,538          | 25   | 244     | 22   | 54,996    | 23            | 105  | 22      | 43   | 11      | 36,963                     | 23   | 71      | 22   | 29      |
| Jacksonville              | 179,939          | 21   | 345     | 13   | 51,857    | 24            | 99   | 24      | 29   | 23      | 67,936                     | 17   | 130     | 13   | 38      |
| Seattle                   | 186,197          | 19   | 370     | 11   | 77,955    | 18            | 155  | 13      | 42   | 13      | 52,412                     | 20   | 104     | 17   | 28      |

<sup>a</sup> See Table I.

<sup>b</sup> Calculated by dividing tax revenues by general revenues.

<sup>c</sup> Cities whose Total Borrowing: Total Revenue Ratios were greater than that of New York City.

<sup>d</sup> Calculated by dividing intergovernmental revenues by general revenues.

TABLE III

DEBT STATISTICS OF THE 25 LARGEST CITIES IN THE UNITED STATES: 1974-5<sup>a</sup>

|                           | Gross Debt <sup>c</sup> |      |                 | Total Borrowing  |      |                 | Tot. Bor. :<br>Tot. Rev. <sup>b</sup> |      |
|---------------------------|-------------------------|------|-----------------|------------------|------|-----------------|---------------------------------------|------|
|                           | Total<br>(000's)        | Rank | Per Rank<br>cap | Total<br>(000's) | Rank | Per Rank<br>cap | Ratio                                 | Rank |
| NYC                       | 14,793,806              | 1    | 1934            | 2,175,607        | 1    | 285             | 15.3                                  | 8    |
| Chicago                   | 1,304,465               | 4    | 441             | 21,295           | 18   | 7               | 1.7                                   | 24   |
| Los Angeles               | 2,299,965               | 2    | 837             | 133,243          | 5    | 49              | 8.6                                   | 14   |
| Philadelphia <sup>c</sup> | 1,304,534               | 3    | 701             | 159,337          | 4    | 86              | 16.6                                  | 6    |
| Detroit                   | 763,327                 | 6    | 550             | 44,636           | 13   | 32              | 5.4                                   | 18   |
| Houston <sup>c</sup>      | 653,141                 | 7    | 495             | 70,100           | 19   | 53              | 18.5                                  | 3    |
| Baltimore                 | 565,014                 | 8    | 644             | 32,090           | 15   | 37              | 3.1                                   | 21   |
| Dallas                    | 478,844                 | 13   | 587             | 19,794           | 20   | 24              | 6.7                                   | 16   |
| San Diego                 | 142,348                 | 24   | 188             | 8,000            | 23   | 11              | 3.5                                   | 20   |
| San Antonio <sup>c</sup>  | 366,425                 | 16   | 485             | 102,915          | 6    | 136             | 34.2                                  | 1    |
| Wash., D.C. <sup>c</sup>  | 1,152,533               | 5    | 1571            | 207,793          | 3    | 283             | 16.8                                  | 5    |
| Indianapolis              | 268,198                 | 19   | 368             | 425              | 25   | 1               | 0.2                                   | 25   |
| Milwaukee                 | 251,453                 | 21   | 38              | 26,232           | 2    | 271             | 8.9                                   | 13   |
| San Francisco             | 503,348                 | 12   | 106             | 72,528           | 8    | 576             | 9.5                                   | 11   |
| Honolulu                  | 208,277                 | 22   | 8               | 5,290            | 24   | 268             | 2.3                                   | 22   |
| Cleveland <sup>c</sup>    | 404,918                 | 15   | 102             | 69,244           | 10   | 337             | 23.3                                  | 2    |
| Memphis                   | 546,022                 | 10   | 829             | 59,809           | 12   | 91              | 12.1                                  | 10   |
| Phoenix <sup>c</sup>      | 316,677                 | 17   | 497             | 34,315           | 14   | 54              | 16.5                                  | 7    |
| Boston                    | 523,130                 | 11   | 846             | 84,242           | 7    | 136             | 12.7                                  | 9    |
| New Orleans <sup>c</sup>  | 261,266                 | 20   | 456             | 9,219            | 22   | 16              | 4.0                                   | 19   |
| St. Louis                 | 169,693                 | 23   | 304             | 25,000           | 16   | 45              | 8.9                                   | 12   |
| Columbus                  | 1,296,996               | 18   | 549             | 19,480           | 21   | 18              | 5.8                                   | 17   |
| San Jose <sup>c</sup>     | 140,887                 | 25   | 269             | 24,903           | 17   | 48              | 18.5                                  | 4    |
| Jacksonville              | 549,660                 | 9    | 1053            | 65,030           | 11   | 13              | 1.9                                   | 23   |
| Seattle                   | 474,500                 | 14   | 943             | 20,567           | 19   | 41              | 7.5                                   | 15   |

<sup>a</sup>See Table I.

<sup>b</sup>Total Borrowing: Total Revenue Ratio (was) calculated by dividing total borrowing by total revenue.

<sup>c</sup>Cities whose Total Borrowing: Total Revenue Ratios were greater than that of New York City.

cities which have increased their populations between 1960 and 1973 and 2) less affluent northern cities whose populations have declined (Table IV).

In general the southwestern cities had healthier tax situations. While their citizens were paying less taxes per capita, the tax collections were providing relatively larger percentages of the general revenues. Their ranks on the percentage of general revenues paid in taxes were greater than those for the absolute taxes paid (Table II). The reverse was true for the other cities; their high taxes were comparatively less important as a source of all general revenues.

The southwestern cities also exhibited a more optimistic position with respect to their expenditures. Their per capita expenditures on capital outlay (as a proportion of all general expenditures) were greater than in the other cities; they were placing a greater emphasis on their future growth (Table V).

#### EFFECTS OF ECONOMIC STRUCTURES

The employment structures of the eight cities show that New York City and Washington, D.C. both had large percentages of their work forces in government, finance or service industries (Table IV). These two cities also generally had the highest levels of per capita and total revenues, taxes, intergovernmental aid, expenditures, public welfare expenditures, and debt outstanding and borrowed (Tables II, III, and V). No other significant relationship seemed to exist between the other six cities' overall fiscal situation and their employment structures.

#### NEW YORK CITY'S UNIQUE FISCAL PROBLEMS

In comparison with all of the 24 cities studied, New York City's fiscal situation was unique in many ways. Its total debt and borrowing was much greater than any other city. Its per capita debt outstanding was 23 percent greater than that of Washington, D.C., the second ranking city. The total outstanding gross debt was seven times that of Los Angeles, its nearest competitor. Washington, D.C.'s per capita total borrowing almost equalled that of New York City's, but both were over two times greater than Boston, the third ranking city. Yet New York City's total borrowing for 1974-5 was 83 times greater than that of any other city. Its expenditures on public welfare and employee-retirement expenditures were also greater than any other city (Tables III and V).

It can be concluded that New York City's fiscal problems came about not just because it was losing its tax base and using long term loans to finance current expenditures, but because it was doing so in such large amounts. The City may have been overly generous in supplying services to its own citizens and its commuters; it ranked second only to Washington, D.C. in per capita expenditures but first in total expenditures. Therefore it needed very large amounts of revenues from taxes and aid from the federal and state governments as well as rather considerable amounts from borrowed funds.

#### SUMMARY AND IMPLICATIONS

There were seven cities whose total borrowing formed a larger percentage of total revenues than in New York City. These all could be divided into two types. The first were growing communities in the Southwest with small but generally adequate tax collections. The second were declining communities in the North with large but not necessarily adequate tax collections for their expenditures. Except for Washington, D.C.'s and

TABLE V

SELECTED GENERAL EXPENDITURES OF THE 25 LARGEST CITIES IN THE UNITED STATES: 1974-5a

|                      | General Expenditures |      |      |         |                |                  |     |                  |    |                |           |     |                    |       |         |     |      |    |
|----------------------|----------------------|------|------|---------|----------------|------------------|-----|------------------|----|----------------|-----------|-----|--------------------|-------|---------|-----|------|----|
|                      | Total                |      | Per  |         | Capital Outlay |                  |     |                  |    | Public Welfare |           |     | Employ. Retirement |       |         |     |      |    |
|                      | (000's)              | Rank | Cap  | Rank    | Total          | Rank             | Per | Rank             | %  | Rank           | Total     | Per | Rank               | Total | Rank    | Per | Rank |    |
|                      |                      |      |      | (000's) |                | cap <sup>d</sup> |     | age <sup>b</sup> |    | (000's)        | cap       |     | (000's)            |       | cap     |     |      |    |
| NYC                  | 11,641,287           | 1    | 1522 | 2       | 1,467,687      | 1                | 192 | 3                | 13 | 23             | 2,887,664 | 1   | 378                | 1     | 850,606 | 1   | 111  | 1  |
| Chic                 | 984,238              | 3    | 310  | 17      | 139,474        | 6                | 44  | 23               | 14 | 21             | 18,538    | 8   | 6                  | 10    | 76,523  | 4   | 2    | 21 |
| LosAng               | 840,861              | 6    | 306  | 18      | 163,104        | 4                | 59  | 18               | 19 | 13             | 777       | 14  | d                  | 17    | 111,695 | 2   | 41   | 6  |
| Phila <sup>c</sup>   | 929,140              | 4    | 499  | 6       | 144,407        | 5                | 78  | 13               | 16 | 20             | 40,402    | 6   | 22                 | 6     | 56,000  | 6   | 30   | 9  |
| Det.                 | 622,368              | 8    | 449  | 8       | 54,940         | 14               | 79  | 12               | 18 | 16             | 43,694    | 5   | 2                  | 12    | 76,747  | 3   | 55   | 5  |
| Hous <sup>c</sup>    | 296,157              | 11   | 224  | 24      | 91,163         | 8                | 69  | 14               | 31 | 3              | 46        | 19  | d                  | 19    | 8,093   | 18  | 6    | 18 |
| Balt                 | 917,110              | 5    | 1045 | 4       | 194,704        | 2                | 222 | 2                | 21 | 10             | 137,241   | 3   | 156                | 4     | 27,695  | 9   | 32   | 7  |
| Dallas               | 245,844              | 13   | 301  | 19      | 85,080         | 9                | 104 | 7                | 35 | 1              | -         | 20  | d                  | 20    | 11,076  | 14  | 14   | 15 |
| SDiego               | 176,438              | 22   | 233  | 22      | 35,247         | 20               | 47  | 21               | 20 | 11             | 110       | 18  | d                  | 18    | 8,977   | 17  | 12   | 16 |
| SanAnt <sup>c</sup>  | 126,174              | 24   | 167  | 25      | 27,353         | 22               | 36  | 25               | 22 | 9              | 1,535     | 13  | 2                  | 13    | 1,485   | 22  | 2    | 22 |
| WashDC <sup>c1</sup> | 1,368,780            | 2    | 1865 | 1       | 183,942        | 3                | 251 | 1                | 13 | 22             | 236,335   | 2   | 322                | 2     | 71,245  | 5   | 97   | 2  |
| Indian               | 234,424              | 14   | 322  | 14      | 44,943         | 16               | 62  | 16               | 19 | 14             | 30,629    | 7   | 42                 | 5     | 6,847   | 19  | 9    | 17 |
| Milw                 | 199,592              | 17   | 289  | 20      | 35,720         | 19               | 52  | 20               | 18 | 15             | -         | 21  | -                  | 21    | 15,104  | 11  | 22   | 10 |
| SanFran              | 586,165              | 9    | 853  | 5       | 70,204         | 11               | 102 | 8                | 12 | 24             | 133,023   | 4   | 194                | 3     | 49,683  | 7   | 72   | 3  |
| Honol                | 220,515              | 16   | 322  | 15      | 55,157         | 14               | 80  | 11               | 25 | 6              | -         | 22  | -                  | 22    | -       | 24  | d    | 24 |
| Cleve <sup>c</sup>   | 245,502              | 12   | 362  | 12      | 40,908         | 17               | 60  | 17               | 17 | 18             | 199       | 17  | d                  | 16    | 334     | 23  | d    | 23 |
| Memph                | 318,323              | 10   | 483  | 7       | 71,235         | 10               | 108 | 6                | 22 | 8              | 543       | 15  | 1                  | 14    | 11,166  | 13  | 17   | 13 |
| Phoenix <sup>c</sup> | 198,775              | 19   | 312  | 16      | 58,919         | 13               | 92  | 10               | 30 | 4              | 241       | 16  | d                  | 15    | 1,609   | 21  | 3    | 20 |
| Boston               | 672,442              | 7    | 1088 | 3       | 108,097        | 7                | 175 | 4                | 16 | 19             | 4,455     | 9   | 7                  | 7     | 42,808  | 8   | 69   | 4  |
| NOrlean              | 197,409              | 20   | 344  | 13      | 39,202         | 18               | 68  | 15               | 20 | 12             | 3,647     | 10  | 6                  | 8     | 12,224  | 12  | 21   | 11 |
| SLouis               | 229,783              | 15   | 412  | 9       | 24,386         | 24               | 44  | 24               | 14 | 25             | 3,472     | 11  | 6                  | 9     | 9,395   | 16  | 17   | 14 |
| Colum                | 140,922              | 23   | 261  | 21      | 24,188         | 25               | 45  | 22               | 17 | 17             | -         | 23  | -                  | 23    | -       | 25  | -    | 25 |
| SJose                | 119,672              | 25   | 229  | 23      | 28,812         | 21               | 55  | 19               | 24 | 7              | -         | 24  | -                  | 24    | 2,795   | 20  | 5    | 19 |
| Jacks                | 199,115              | 18   | 382  | 11      | 63,842         | 12               | 122 | 5                | 32 | 2              | 2,507     | 12  | 5                  | 11    | 11,019  | 15  | 21   | 12 |
| Seattle              | 196,241              | 21   | 390  | 10      | 50,320         | 15               | 100 | 9                | 26 | 5              | -         | 25  | -                  | 25    | 15,256  | 10  | 30   | 8  |

a See Table I.

b Calculated by dividing general expenditures by capital outlay expenditures.

c Cities whose Total Borrowing: Total Revenue Ratios were greater than that of New York City.

d Values were less than \$0.50.

TABLE IV

POPULATION GROWTH AND EMPLOYMENT STRUCTURES OF CITIES WITH LARGE BORROWING: REVENUE RATIOS  
(EXPRESSED AS PERCENTAGES OF EMPLOYEES ON NONAGRICULTURAL PAYROLLS)

| City        | Population <sup>b</sup> |       | Manufac-<br>turing | Whole-<br>sale/<br>Retail<br>Trade | Ser-<br>vices | Transpor-<br>tation/<br>Public<br>Utilities | Con-<br>tract<br>Construc-<br>tion | Finance        |                | Govern-<br>ment |
|-------------|-------------------------|-------|--------------------|------------------------------------|---------------|---|------------------------------------|----------------|----------------|-----------------|
|             | Change:1960-73          | %     |                    |                                    |               |   |                                    | Real<br>Estate | Insur-<br>ance |                 |
|             | Abso-<br>lute           | age   |                    |                                    |               |   |                                    |                |                |                 |
| SanAntonio  | 168,226                 | 28.6  | 13.3               | 24.2                               | 17.1          | 4.4   | 4.8                                | 6.3            | 29.4           |                 |
| Cleveland   | -197,385                | -22.5 | 34.5               | 21.4                               | 16.2          | 6.0   | 4.1                                | 4.9            | 12.8           |                 |
| Houston     | 382,018                 | 40.7  | 19.2               | 24.5                               | 18.2          | 8.3   | 8.9                                | 5.4            | 11.8           |                 |
| San Jose    | 319,116                 | 156.4 | 32.9               | 18.8                               | 20.0          | 4.5   | 4.5                                | 3.5            | 15.7           |                 |
| Wash., D.C. | -30,419                 | -4.0  | 3.8                | 19.6                               | 21.8          | 5.2   | 5.9                                | 5.9            | 37.7           |                 |
| Phila.      | -141,281                | -7.1  | 30.5               | 20.5                               | 17.7          | 5.8   | 4.8                                | 5.7            | 14.8           |                 |
| Phoenix     | 198,121                 | 45.1  | 21.6               | 25.0                               | 16.8          | 5.5   | 6.4                                | 6.9            | 17.8           |                 |
| NYC         | -135,182                | -1.7  | 20.9               | 20.9                               | 20.5          | 7.8   | 3.5                                | 10.6           | 15.8           |                 |

<sup>a</sup> Employment figures from U.S. Department of Commerce, Bureau of the Census, Statistical Abstract of the United States: 1971, (92nd edition), Washington, D.C.: U.S. Government Printing Office, 1971.

<sup>b</sup> Population change calculated from 1973 estimates used in City Government Finances in 1974-5 and the 1960 figures in the Statistical Abstract of the United States: 1971.

New York City's large government, finance, and service employment, these all had similar employment structures. However, New York City's finances were much different from the other seven cities in one very important way: the City's total volume of money handled greatly surpassed all others. Only Washington, D.C. approached New York City's very high per capita levels of revenues, expenditures, and debt (in total amounts no city spent similar amounts). New York City's near default was a result of its questionable fiscal tactics and also the tremendous amounts of money needed for the City to function efficiently.

It is highly improbable that any major city in the United States will face default for the same reasons that New York City did. New York City was not completely straightforward in its financing and tighter fiscal controls existing now<sup>(5)</sup> should prevent other cities from having the same opportunity to get into deep trouble. In addition, New York City deals with much larger sums of money than any other city, partially because of its very generous employment and welfare systems. Since no other city approaches New York in this respect (except perhaps Washington, D.C. in per capita amounts), none should have the same fiscal problems.

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# CHANGING PATTERNS OF HIGH STATUS RESIDENTIAL LOCATION AS ILLUSTRATED BY CHICAGO

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## INTRODUCTION

Various studies have examined the residential patterns of the upper income or higher status group. As a rule, these studies have found that the households in this income group have moved away from the center of the city to the urban fringe. The flow pattern of these households has been debated and studied for the past 50 years. Burgess(1) argued that this type of family occupies the outer concentric zones of an urban area. Conversely, Hoyt(2) argued that this type of family locates in a sectoral or axial pattern in relationship to the center of the city.

Recent studies have related these locational tendencies to characteristics of the cities. Schnore(3) has shown that the Burgess thesis is most often evidenced in the largest and the oldest metropolitan areas. In later studies, researchers have shown that other characteristics of the metropolitan area such as housing attributes, the industrial base, and the minority-racial composition are variables affecting the location of the higher status household.(4)

In another body of literature, researchers have found that the locational choice of the higher status household has been based on a trade off between travel costs and locational amenities. The travel costs have been measured in the form of out-of-pocket expenditures and travel time between home and work. In several studies, the amenities have been represented by variables such as the size and age of the house, the size and aesthetic quality of the residential lot and its environment, central city congestion, crime, good schools and/or class homogeneity.(5) These studies are predicated on the theory that as transportation in the cities improved due to the rise of private automobile use and the construction of surfaced streets and major arterials to accommodate the auto, the higher status household moved away from the center of the city to obtain the locational amenities at the fringe of the city.

As is evident, most of the literature has investigated the movement of the upper income group away from the center of the city. This outward expansion has been described as either a pattern of sectoral expansion (Hoyt) or a pattern of zonal expansion (Burgess). Both models ascribe to a one-way directional bias away from the center of the city by means of new growth at the margin of either the sector or the zone. However, since the upper income group has a higher degree of selectivity in their choice of residence, it seems reasonable to postulate that they would also have more options than a one-way directional movement toward the urban fringe. This study attempts to ascertain whether or not the upper income group has exhibited an alternative choice to such outward growth, namely, residential expansion at or near the center of the city.

## METHODOLOGY

In order to test for the existence of this expansion of the upper income group near the urban core, 64 census tracts were chosen for analysis. These tracts have historically been associated with high income residential areas within the city of Chicago. The 64 census tracts selected include

the "loop" area of Chicago, the CBD, and the northward extension along Lake Michigan. This area conforms to the tenets expressed by Hoyt and others as to the locational choice of wealthy individuals. Specifically, the area is accessible to downtown Chicago with its job market, shopping areas and cultural facilities. It also provides easy access to the lake, possesses recreational advantages associated with the lake, and offers the modifying effects of the lake on both summer and winter temperatures.

The initial task of this investigation was to determine which of the census tracts in the selected area of Chicago possessed the socio-economic characteristics associated with the higher status residential areas. Those data deemed to be pertinent to the study were subjected to orthogonal factor analysis with varimax rotation (6). Nine socio-economic variables for the 64 census tracts provided the information for the data matrix. The varimax rotation technique produced factor loadings and factor scores which were used to analyze the similarity of the census tracts. Factor loadings identified the cluster of interrelated variables that were associated with the higher status factor pattern (7) and the factor scores identified the census tracts that were associated with the cluster of high status variables.

#### EMPIRICAL RESULTS

Tables 1 and 2 present the factor loadings for the socio-economic variables examined in the investigation. Factor I in both tables reveals a strong relationship among those variables that indicate a high status household. The high loadings for managers, professionals, high median income, and percent of persons earning more than \$15,000 on Factor I in Table 1 for 1960, and a similar relationship in Table 2 for 1970, conform to past findings that these variables are indicators of the higher socio-economic groups in an urban community (8). Therefore, Factor I for both the 1960 and 1970 data was considered as a high status factor. The proportion of total variance accounted for by Factor I in both 1960 and 1970 is approximately 55%, and this factor was the most significant in explaining the variation in the data matrix. Since a major objective of this study was to discern the spatial residential patterns of the upper income households, no attempt was made to account for the groupings in the additional factors that were generated.

Tables 3 and 4 indicate the factor scores for those census tracts that were closely associated with the elite or high social status factor. Only factor scores greater than one are significantly associated with the factor grouping (9).

Figure 1 shows the location of the census tracts in 1960 that had factor scores greater than one for the high status factor. The pattern suggests a strong attachment to the lake north of the core of the city. In addition, all but one of the tracts were located in the harbor areas that serve pleasure craft.

Figure 2 illustrates the location of census tracts in 1970 that were strongly tied to the high status factor. Eleven census tracts were identified with the higher status factor in 1970 and these eleven tracts included all but two of the tracts associated with the 1960 high status factor. Most interesting to this investigation is the development and expansion of high income residential areas just north and adjacent to the core, and in the CBD itself.

The trend for the 1960 and 1970 period tends to suggest a few interesting locational developments for the high status residential areas.

Table 2

Factor Loadings for Selected Census Tracts:

Chicago, 1970

|  | Factor I | Factor II                                       | Factor III |
|--|----------|---|------------|
| Variable                               | Loading  | Variable  | Loading    |
| Manager and Administrative Occupations | .92      | Professional, Technical and Kindred Occupations | .79        |
| Median Family Income                   | .90      | In Migration Since 1965                         | .86        |
| Percent Earning More Than \$15,000     | .87      | Percent Renter Occupied                         | .72        |
| Percent of Housing Built From 1960-70  | .84      |   |            |
| Mean Gross Rent                        | .76      |   |            |

Table 1

Factor Loadings for Selected Census Tracts:

Chicago, 1960

|   | Factor I | Factor II                             |         |
|---|----------|---------------------------------------|---------|
| Variable  | Loading  | Variable                              | Loading |
| Median Family Income                            | .96      | Percent of Housing Built From 1950-60 | .74     |
| Manager and Administrative Occupations          | .91      | Renter Occupied                       | .71     |
| Mean Gross Rent                                 | .87      | In Migration Since 1955               | .60     |
| Percent Earning More Than \$15,000              | .84      | Percent Negro                         | .50     |
| Professional, Technical and Kindred Occupations | .77      |                                       |         |

Table 4

Factor Scores for Selected Census Tracts:

Chicago, 1970

|              | Factor I | Factor II    | Factor III |
|--------------|----------|--------------|------------|
| Census Tract | Score    | Census Tract | Score      |
| 3201         | 3.97     | 713          | 1.33       |
| 801          | 2.86     | 715          | 1.22       |
| 814          | 2.16     | 3202         | 1.13       |
| 816          | 1.73     |              |            |
| 813          | 1.63     |              |            |
| 3206         | 1.47     |              |            |
| 802          | 1.44     |              |            |
| 632          | 1.18     |              |            |
| 812          | 1.12     |              |            |
| 314          | 1.08     |              |            |
| 619          | 1.03     |              |            |

Table 3

Factor Scores for Selected Census Tracts:

Chicago, 1960

|              | Factor I | Factor II    |       |
|--------------|----------|--------------|-------|
| Census Tract | Score    | Census Tract | Score |
| 801          | 3.17     | 3201         | 4.06  |
| 619          | 1.64     | 808          | 2.80  |
| 314          | 1.58     | 3203         | 2.00  |
| 632          | 1.53     | 811          | 1.46  |
| 633          | 1.29     | 819          | 1.15  |
| 3203         | 1.08     | 818          | 1.10  |

Fig. 1. HIGH STATUS FACTOR PATTERN, CHICAGO 1960

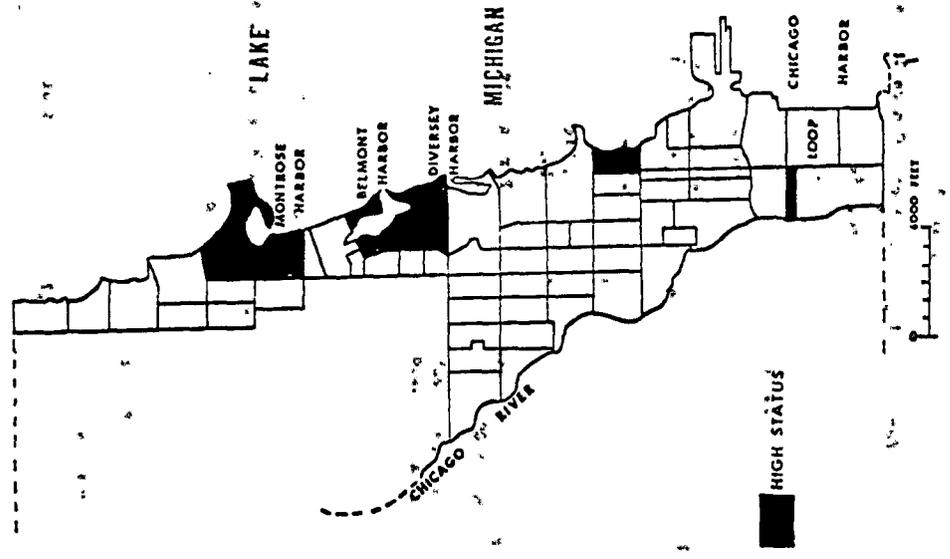
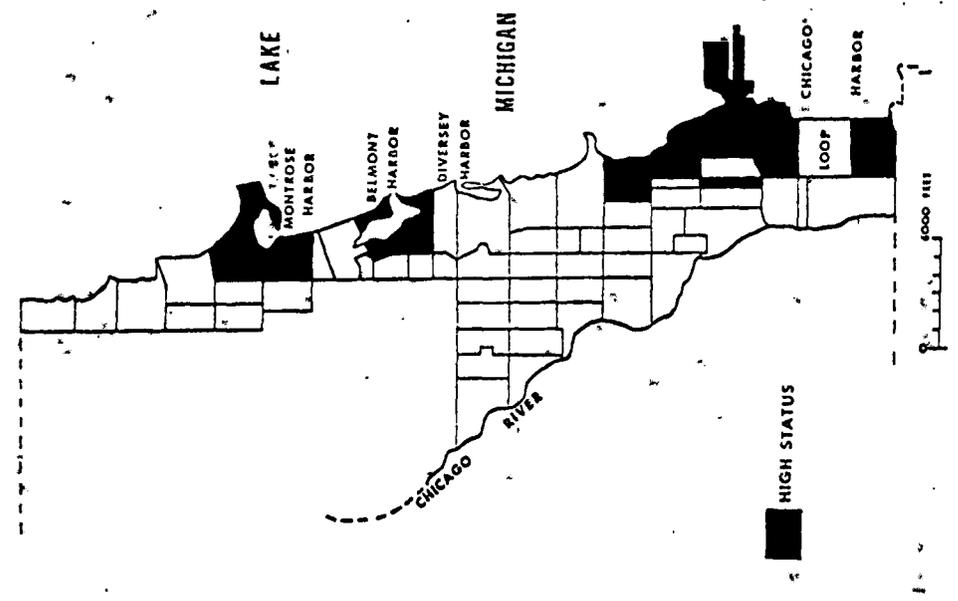


Fig. 2. HIGH STATUS FACTOR PATTERN, CHICAGO 1970



First, there has been a close attachment to the scenic harbor areas north of the CBD. This trend supports many of the previous findings that the wealthy class seeks out those areas that possess pleasing residential environments, as evidenced by the Montrose and Belmont harbor areas. However, of more importance to this investigation was the spatial pattern indicated by the census tracts near the loop in the downtown section. These census tracts were strongly associated with the high status factor in 1970, but were not identified with the upper income group in 1960. The spatial pattern in 1970 offers evidence that the upper income groups have expanded their residential locational choices toward the center of the city, thus tending to substantiate the major contention of this study that the higher income residents have expressed an alternative to the more generally accepted centrifugal movement expounded in the literature.

#### CONCLUSIONS

The classical land use models of Burgess and Hoyt have been applicable for most of this century. However, there appears to be a new social-residential pattern developing. The results of this study tend to indicate that in the city of Chicago, which served as a laboratory for both the Burgess and Hoyt models, there has been a growth of higher status neighborhoods both near to and in the core of the urban area during the 1960-70 period. This finding is not a refutation of either the Burgess or Hoyt hypothesis. Their approach focused on a generalization about residential expansion in a metropolitan area based on aggregate statistics contrasting the central city and the suburban ring. However, this study examined a specific section of the central city over time and found an inward expansion of higher status neighborhoods instead of outward expansion as theorized in previous models.

The above conclusion was also reached by Johnston, in his study of high status households in Christchurch, New Zealand. (10) He found that a segment of the upper income group, the business elite (mainly company directors), sought residential locations in the urban core.

If the spatial pattern identified in Chicago becomes more universally accepted as an alternative residential mode for the high income social class, the implications suggest the need for the formulation of new (different) land use policies for the inner city. The success of such policies will necessarily depend on a greater understanding of the forces and preferences of the higher income groups in their desire to re-inhabit the inner core.

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"unified system of settlement" is often advocated whereby functional inter-relationships between cities, especially those of suburban towns with the central city, are stressed. (5)

Other measures employed to curtail large city growth have been migration controls, systems of "greenbelts", and use of the bureaucratic decision making structure. Controls over population movements have been employed at times; labor books, internal passports, and special residency requirements for the large cities were attempts at controlling the pace and the direction of migration streams. The greenbelt concept, whereby a zone of open space would surround cities, emerged out of the Moscow Plan. Industrial establishments were to be forbidden in this zone thereby attempting to halt the outward expansion of industry. Less direct approaches have made use of the bureaucratic decision making structure. For example, the placement of additional powers over housing and services in the hands of local city governments rather than industrial ministries is an attempt to restrain the over-urbanization caused by ministries' desires for locations in the large cities. Likewise, the requirement that national organs such as Gosplan USSR give final approval to investment projects is an attempt to further dissipate the industrial ministries' ability to direct project funds to the larger cities.

#### SOME EMPIRICAL OBSERVATIONS

Despite the official commitment to control urban growth, the USSR appears to be emulating the world-wide trend of an increasing concentration of the urban population in the larger cities of the hierarchy. Whereas only 36.1% of the urban population lived in cities larger than 100,000 in 1926, 57.1% were in that category by 1974. More specifically, 15.6% of the urban population resided in cities of greater than 500,000 in 1926 and 27.9% in 1974. Obviously the Soviets have not done away with large cities, but such aggregate data must be supplemented by more refined analysis in order to appraise the Soviet efforts meaningfully. A number of additional calculations and observations have therefore been made using the Soviet census materials for 1959 and 1970: (6)

Further analysis of the 1959-70 data reveals that 75% of the 36 million increase in urban inhabitants occurred in cities that exceeded 100,000 in 1970. Previous research has argued that investment flows are biased toward political capitals because of the merging of political and economic aspects in Soviet society. (7) Therefore, the growth rates of administrative capitals versus non-administrative centers were calculated for the 219 cities exceeding 100,000 in 1970. In the 100,000-500,000 category (187 cities), 76.5% of the political capitals (75 of 98 cities) grew at a rate exceeding the national average for all cities. Conversely, only 41.6% of the non-capitals (37 of 89 cities) exceeded the national average. Since 31 of the 32 cities in excess of 500,000 were political capitals, a division into two groups was unnecessary. Interestingly, only 35.5% of these political capitals (11 of 31 cities) exceeded the national growth average.

Since the larger the city the greater the difficulty in maintaining high percentage growth rates, the absolute data on city populations were also analyzed. The assumption used was that a dynamic political capital would, over time, increase its dominance within the administrative unit's urban hierarchy (e.g. Moscow, if dynamic, would account for a higher percentage of Moscow Oblast's urban population in 1970 than it did in 1959). For the political capitals in the 100,000-500,000 range, 77.4% of the cities were found to have increased their "percentage of the total administrative unit's urban population" for the 1959-70 period; only 45.2% of

the political capitals in excess of 500,000 increased their primacy position in that same period. The argument that appears to be tenable is that the Soviets have not been entirely successful, nor have they been entirely unsuccessful, in limiting large city growth (>500,000). Success in stimulating cities in the 100,000-500,000 range is evident, but mainly in the case of those cities that enjoy political significance.

A final observation naturally follows from the above data: as a group, the towns under 100,000 are decreasing in relative importance in the Soviet urban hierarchy. While 63.9% of all urban population resided in these cities in 1926, only 42.9% lived there in 1974. This trend has continued in the 1960's and 1970's despite the official policy of priority investment in these towns. Such an aggregate statistic, however, conceals as much as it reveals. The previous discussion of satellite cities, as well as a knowledge of the trickle-down forces associated with the large Soviet cities(8), suggests the hypothesis: as distance from a large administrative capital increases, the expected population growth for a given city will decline as a result of the lessened probability of investment. Some initial testing for Moscow Oblast generally supported the hypothesis.(9) Thus, the policy of stimulating growth in small and medium-size cities appear to be a selective strategy rather than a blanket dictate to invest in all such cities. Further testing for the other urban agglomerations of the USSR is obviously needed.

#### CONCLUSION

The basic reason for the limited Soviet success in curtailing large city growth, as well as for the specific patterns of growth in small and intermediate-size cities, is related to the goal of rapid industrialization. Given the socio-economic environment existing in the USSR, expediency has often dictated locations in large cities, or in their smaller satellite communities, so that urbanization economies, economies of scale, and established social overhead capital can most easily be garnered. For intermediate-size cities (100,000-500,000) the most attractive locations have been the administrative capitals, in part because of their political significance in industrial decision making.

Out of this quest for industrial growth has emerged a planning system dominated by sectoral ministries. The resulting weakness of territorial planning officials (including urban planners) has meant that industrial ministries often can override the official restrictions on large city development in order to maximize growth in the short-run. Ministries are not concerned with the costs of over-urbanization since such negative externalities are generally borne by the cities themselves.

#### ACKNOWLEDGMENTS

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## THE INCREASING IMPORTANCE OF MORTALITY IN POPULATION TRENDS: THE NORTH-EASTERN U.S., 1940-1974

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Studies of components of U.S. population change in this century typically cite the fact that the nation's mortality rates declined until the 1940's, and remained at that low level(1) until very recently when the rate fell below nine per 1,000 for the first time.(2) It is also true that geographic variations at different levels of aggregation rendered mortality trends much more complex than the national averages indicate. Moreover, and with specific reference to this study, the role played by mortality in natural increase and, by extension, in the patterns of population growth or decline in the nine-northeastern states presents several particularly interesting and significant departures from long-term national trends. Whereas fertility accounted for a greater proportion of reproductive change, in recent years mortality has risen to a more prominent position (much as it had during the 1930's and early '40's). These general statements are reflective of downward trends in mortality and extensions in longevity at both national and lower levels of aggregation. In New England and the Middle Atlantic States, differential fertility declines and net-migration, which produce gross differences in age structures among counties and SEAs, seem to have special significance.

This study has as its purpose the description of mortality trends, an examination of the increasing impact of mortality upon reproductive change and, finally, the effect of mortality on population growth or decline. The northeastern U.S. is studied using SEA and county units; and the temporal scale covers the 1940-, 1950-, and 1960-decades, as well as the 1970 to 1974 period.

### DATA

The periods studied were determined by the availability of information descriptive of the components of population change. The earliest published data appeared in a Scripps Foundation report covering the 1940-decade, (3) in which the State Economic Area was employed as the smallest spatial unit. The U.S. Bureau of the Census, in its Current Population Reports, provided components of change by county-unit for the 1950- and 1960-decades, (4) but vital statistics and net-migration by county were not available for 1940-1950. Estimates extending the county data beyond the 1970 enumeration, to July 1, 1974, were also available in government documents. (5)

To insure comparability, 1960-SEA boundaries were adopted for all periods. Resulting adjustments in the 1940-50 figures included two boundary changes in New York, three in New Jersey, and one in Pennsylvania. The Vital Statistics of the United States was consulted for 1940 and 1950 and all intervening years, and the necessary adjustments were made according to procedures outlined by Bogue. (6) For the later periods, figures for the 217 counties of the nine-state region were merely aggregated upward to obtain data for the 70 SEAs.

### PRIMARY CORRELATIONS

Population change was correlated with its major components, natural increase and net-migration, for each of the four periods. In addition,

natural increase was correlated with its subcomponents, fertility and mortality. Although, for any areal unit, change is the algebraic sum of natural increase and net-migration, the spatial distributions of change and either of its primary components need not be accordant. For example, if change were more highly correlated with net-migration than with natural increase, one could assume that population movements were a more important determinant of the geographic pattern of change than the net effect of reproduction and mortality. Thus, these correlations can be used to detect spatial-temporal trends in the relative importance of the various components and subcomponents of change.

Net-migration has been the major geographic control of population change throughout the period at both county- and SEA-scales (Table 1). The significance of natural increase has been both less emphatic and more inconsistent than net-migration. These traits are evident for the 1950- and 1960-decades, during which reproductive change had a modest geographic relationship with population trends; and, for the earlier and later periods, its effect was inconsequential.

TABLE 1  
PRIMARY CORRELATIONS

| Period  | Change and:   |          |                  |          | Natural Increase and: |          |        |          |
|---------|---------------|----------|------------------|----------|-----------------------|----------|--------|----------|
|         | Net-migration |          | Natural Increase |          | Births                |          | Deaths |          |
|         | SEAs          | Counties | SEAs             | Counties | SEAs                  | Counties | SEAs   | Counties |
| 1940-50 | 0.96          | n.a.     | 0.26             | n.a.     | 0.88                  | n.a.     | -0.60  | n.a.     |
| 1950-60 | 0.97          | 0.99     | 0.53             | 0.68     | 0.93                  | 0.94     | -0.052 | -0.49    |
| 1960-70 | 0.96          | 0.98     | 0.46             | 0.56     | 0.92                  | 0.90     | -0.74  | -0.73    |
| 1970-74 | 0.98          | 0.98     | 0.08             | 0.16     | 0.72                  | 0.67     | -0.73  | -0.73    |

Source: Computed by authors

The recent decline of natural increase as an important spatial determinant of population growth or decline seems to relate to the significance of mortality as a geographic correlate of reproductive change. For the 1970-74 period, natural increase was more closely associated with mortality than fertility. Moreover, since 1950, as the influence of mortality on natural increase became progressively greater, the effects of fertility on natural increase and of reproductive change on growth diminished (Table 1). Such trends are not unexpected given the reduction in fertility and the concomitant growth in the proportion of aged inhabitants.

#### MORTALITY-FERTILITY RATIOS

The ratio of deaths to births indicates the relative contribution of each to natural increase and the demographic equation. As suggested earlier, the mean ratios have increased in each decade since 1950-60 among counties and SEAs (Table 2). Reporting these trends for ten-year periods disguises the effects of the post-war baby boom, which probably deferred increases of the ratio until some time in the mid-1950's. Table 2 also includes the correlations between each pair of consecutive periods for

the mortality-fertility ratio. The lowest correlation, 0.78 for SEAs between the 1940- and 1950-decades, might have resulted from family disruptions during World War II and the consequent post-war increase in reproduction. It should be emphasized that the strongest interperiod association (0.93) involves a period of less than five years (1970-74), which would decline over the remainder of the decade were demographic events to change drastically.

TABLE 2

TRENDS IN THE MORTALITY-FERTILITY RATIO

|         | Means (a) |          | Interperiod Correlations (b) |          |
|---------|-----------|----------|------------------------------|----------|
|         | SEAs      | Counties | SEAs                         | Counties |
| 1940-50 | 0.568     | n.a      |                              |          |
| 1950-60 | 0.484     | 0.492    | 0.78                         | n.a      |
| 1960-70 | 0.571     | 0.584    | 0.87                         | 0.85     |
| 1970-74 | 0.696     | 0.697    | 0.93                         | 0.85     |

Source: Computed by authors

(a) Means are for each period.

(b) Interperiod correlations show the association between consecutive periods.

Figure 1 depicts the mortality-fertility ratios for each of the periods studied. To facilitate discussion, heighten comparison, and highlight salient trends, the same categories (class limits) were used for all periods. For the 1940-50 decade, the Aroostook Area in Maine was the only SEA to exhibit the high fertility-low mortality descriptive of the lowest ratio class (Figure 1-A). In 1950-60, the Aroostook SEA was joined by several others: Northwestern Vermont; Erie, Pennsylvania; and several in New Jersey (Figure 1-B). Consistent with the previously mentioned decline in the mean SEA mortality-fertility ratio from the 1940- to the 1950-decade, not one SEA was found in the highest ratio class in either of the earlier ten-year periods. Also, fewer SEAs qualified for the second-highest category in 1950-60 than in the previous decade.

The 1960-70 decade is the last period studied during which any SEA (Aroostook, Maine and Narragansett, Rhode Island) belonged in the lowest category (Figure 1-C). Furthermore, the number of SEAs in the second-highest category had increased. By 1974, six SEAs had sufficiently high mortality or low fertility to qualify for the highest-ratio class (Figure 1-D). The distribution of these places seems to be the product of older resident populations, which in turn resulted from in-migration of aged or out-migration of younger inhabitants, both of which would contribute to reduced fertility. Included here are the following SEAs: the Cape Cod Area, Atlantic City, the Mohawk-Adirondack Area, and three SEAs in the Pennsylvania anthracite area. So extreme was the influence of age in the Lackawanna and Luzerne county SEAs in Pennsylvania, that deaths exceeded births for the 1970-74 period (Figure 1-D).

Taken collectively, these four maps portray a series of vast demo-

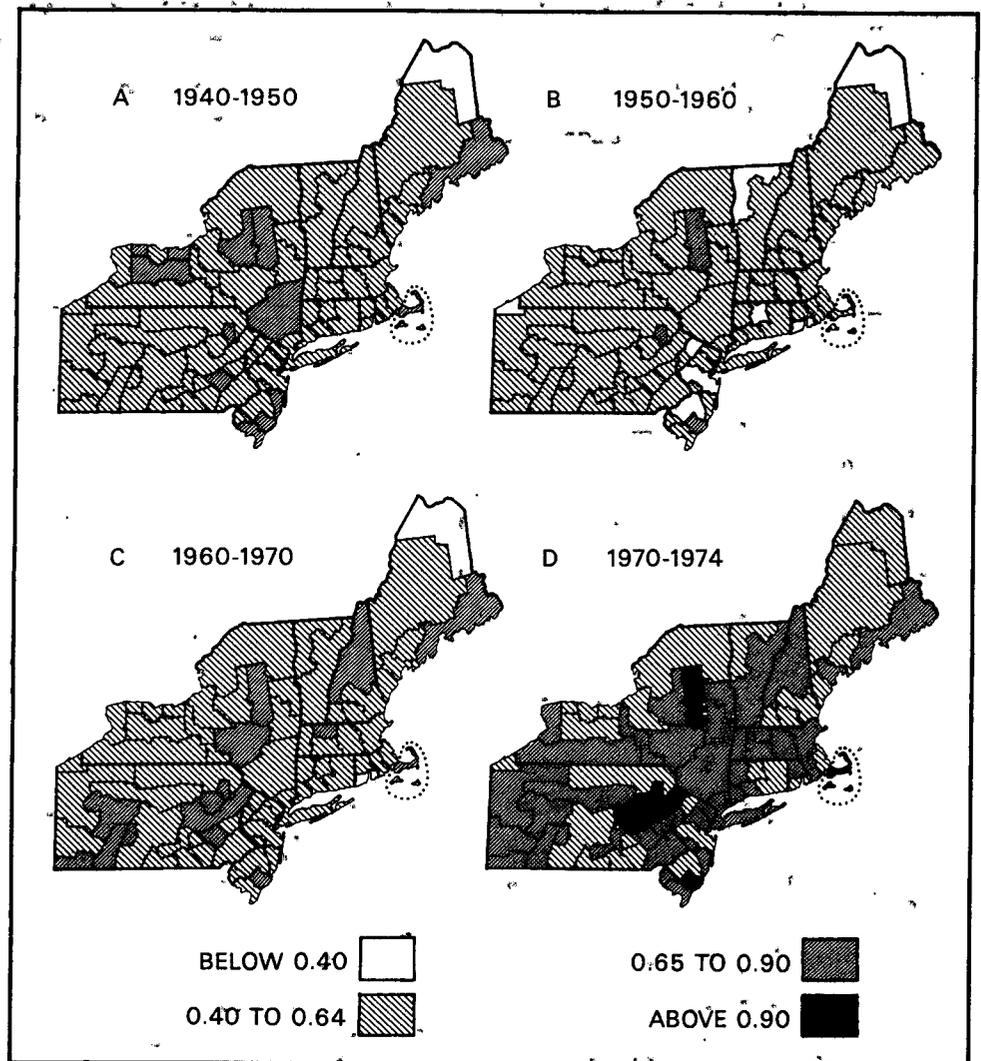


Figure 1

graphic changes and, just as importantly, suggest the degree to which the northeastern states have declined among the nation's regions. Although a discussion of the specific influences which might have contributed to the Northeast's ills is beyond this paper's scope, this study suggests that lowered fertility, increased longevity, and age-selective migration have conspired to exacerbate faltering economic trends in the region.

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## PATTERNS OF POPULATION REDISTRIBUTION IN NON-METROPOLITAN NEW YORK AND NEW ENGLAND, 1950-1975

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Recent migration data for New York and New England reveal a substantial net-outflow from metropolitan areas coupled with a net-inflow to non-metropolitan counties. In this respect the northeast mirrors a national phenomenon of the 1970's: the population revival of rural America. Of particular interest to the geographer is the patterning or fabric of change taking place within the newly reviving rural territory. In this paper, which uses non-metropolitan counties of New York and New England as units of analysis, it is suggested that a new paradigm or model of the pattern of change is needed to fit the emerging trends of the 1970's.

Evidence from previous decades suggests that two fundamental patterns had prevailed within rural regions in the past. The first can be termed population centralization, or the relative growth of larger non-metropolitan centers in contrast to stagnation and decline of the more rural territory. The larger centers were able to attract industry due to agglomeration economies while the rural territory suffered by virtue of loss of jobs in agriculture and other primary job sectors. A second pattern was population spillover from metropolitan areas manifested in ever widening zones of commuting and population growth surrounding urban areas. Thus, an accounting of farm population decline together with an understanding of industrial location trends explained the fabric of change within the more removed rural regions, while examination of expanding commuter sheds described waves of growth surrounding major urban centers. (1)

The conclusion drawn from more recent data, however, is that neither of the foregoing patterns describes population reversal in rural America, for much of the recent growth has accrued to the most rural, least urbanized, of non-metropolitan counties. Moreover, this growth cannot be explained by metropolitan spillover. (2) Some authors suggest, however, that such recent population redistribution patterns can be explained by considering the residential preferences of an increasingly footloose population. (3) Thus, desirable living locations, rather than change in the primary or secondary job sectors, become the key to understanding migration patterns. Since residential preference surveys have revealed that rural rather than urban environments are more desirable, and it can be assumed that natural amenities and recreational opportunities are sought, it then follows that the more rural, more scenic, resort/recreation oriented counties should display higher rates of population growth than their more urbanized, featureless, counterparts. (4)

In order to examine this conclusion, all 1960 non-SMSA counties in New England and New York State are analyzed. Net-migration estimates expressed as annual percentage rates, and available from census sources, are treated as dependent variables. Simple correlations between migration rates and a series of independent variables, begins to document the nature of change within the region. (Table 1)

Consider first the factor of metropolitan spillover, measured by both distance to nearest metropolis and percent commuting to nearest metropolis. Correlations with both variables clearly indicate a significant metropolitan influence in the 1950's and 1960's, but in the 1970's the

TABLE 1.  
Correlations with Net-Migration Rates

| Independent Variables   | Annual Percentage Rate of Net-Migration <sup>1</sup> |           |           |                    |                    |
|---|--|-----------|-----------|--------------------|--------------------|
|   | 1950-1960  | 1960-1970 | 1970-1975 | 1950-60 to 1960-70 | 1960-70 to 1970-75 |
|   | X1   | X2        | X3        | X4                 | X5                 |
| Change in Economic Base   |  |           |           |                    |                    |
| X6 Change in % Employed in Agriculture 1950-60  | .17  |           |           | -.01               |                    |
| X7 Change in % Employed in Agriculture 1960-70  | .02  | -.03      |           | -.31*              | .11                |
| X8 Change in % Employed in Manufacturing 1947-58  |  | -.07      |           | -.03               | -.18               |
| X9 Change in % Employed in Manufacturing 1958-67  |  |           |           | .07                |                    |
| Distance to Urban Areas   |  |           |           |                    |                    |
| X10 Distance to Nearest Metropolis <sup>1</sup>   | .40*   | -.41*     | .21       | .03                | .52*               |
| X11 % Commuting to Nearest Metropolis 1970 <sup>1</sup>                                   | .49*   | .34*      | -.17      | -.12               | -.44*              |
| Urbanization  |  |           |           |                    |                    |
| X12 % of Population Urban 1970  | .34*   | -.02      | -.36*     | -.37*              | -.33*              |
| Economic Base   |  |           |           |                    |                    |
| X13 No. Agricultural Employees per 1000 Population 1970 <sup>1</sup>                      | -.51*  | -.22      | -.11      | .26                | .09                |
| X14 No. Manufacturing Employees per 1000 Population 1970 <sup>1</sup>                     | .01  | -.04      | -.45*     | -.03               | -.36*              |
| Resort-Recreation Amenities   |  |           |           |                    |                    |
| X15 % Seasonal Homes, 1970 <sup>1</sup>   | 2.12   | .15       | .60*      | .30*               | .45*               |
| X16 No. Hotels, Motels, Tourist Courts and Camps per 1000 Population <sup>1</sup>         | -.22   | .10       | .49*      | .33*               | .42*               |
| X17 Receipts of Hotels, Motels, Tourist Courts and Camps per 1000 Population <sup>1</sup> | -.22   | -.00      | .42*      | .20                | .46*               |
| X18 No. Ski-lifts per 1000 Population   | -.34*  | .10       | .23       | .48*               | .15                |

<sup>1</sup>Log transformed for analysis.  
\*Significant at .99 level of confidence

TABLE 2  
Canonical Analysis, Table of Loadings

| ROOT | VARIABLES |      |      |      |      |     |     |     |     |            |      |      |      |     |      |      |      |      | Eigenvalue | Canonical Correlation |
|------|-----------|------|------|------|------|-----|-----|-----|-----|------------|------|------|------|-----|------|------|------|------|------------|-----------------------|
|      | BEHAVIORS |      |      |      |      |     |     |     |     | STRUCTURES |      |      |      |     |      |      |      |      |            |                       |
|      | X1        | X2   | X3   | X4   | X5   | X6  | X7  | X8  | X9  | X10        | X11  | X12  | X13  | X14 | X15  | X16  | X17  | X18  |            |                       |
| 1    | -.72      | .05  | .44  | -.55 | -.09 | .07 | .02 | .02 | .02 | .52        | .21  | -.14 | .72  | .02 | -.09 | .05  | .10  | .22  | .84        | .92*                  |
| 2    | .20       | -.25 | -.72 | .28  | -.49 | .00 | .29 |     |     | .27        | .08  | .25  | .60  | .50 | -.54 | -.03 | -.08 | -.09 | .62        | .79*                  |
| 3    | -.71      | .02  | .20  | .40  | .54  | .34 | .50 |     |     | .27        | -.41 | .04  | -.11 | .67 | .17  | .15  | .13  | .04  | .54        | .74*                  |

\*Significant at .99 level of confidence

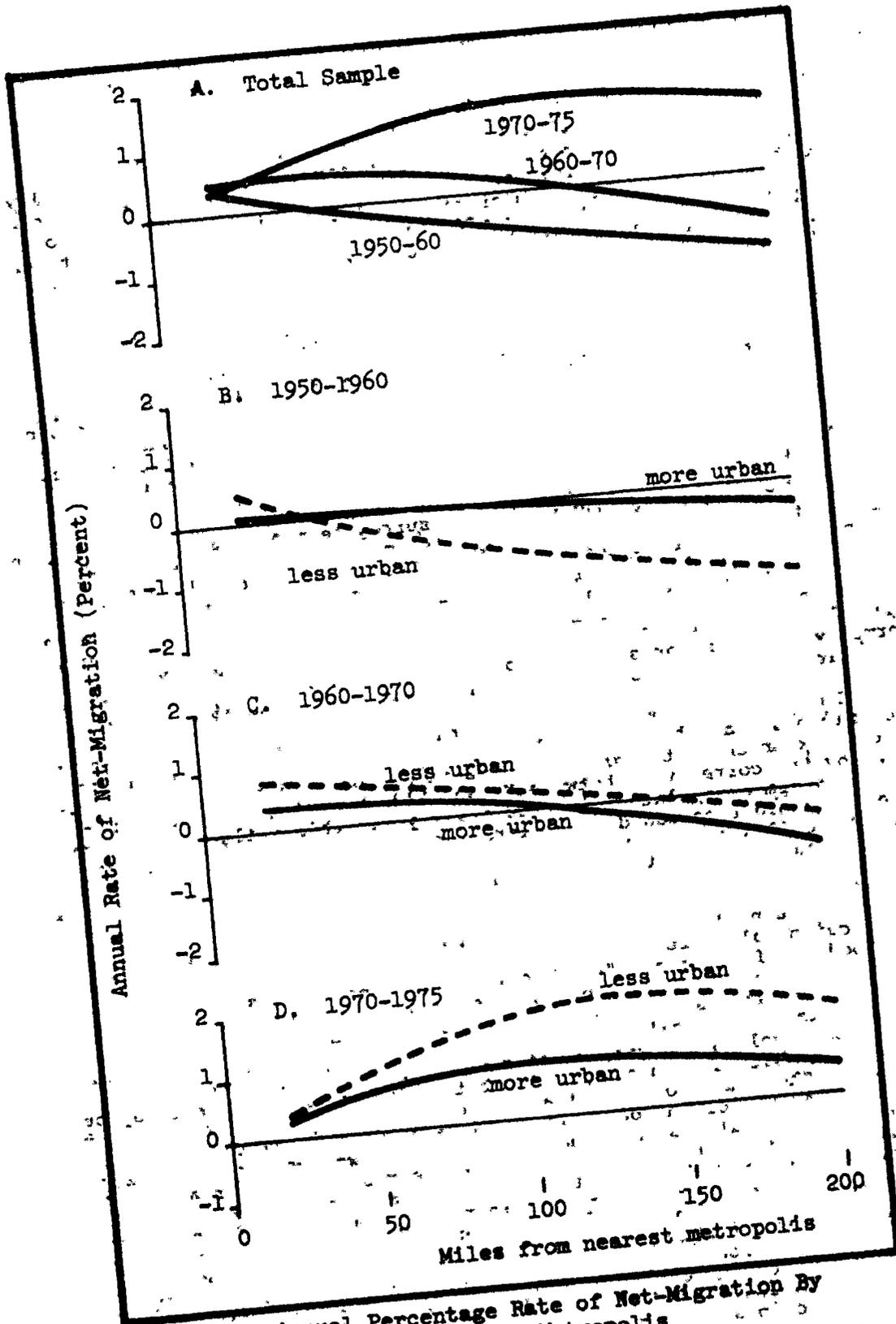


FIGURE 1: Annual Percentage Rate of Net-Migration By Distance to Nearest Metropolis

The results of the analysis are presented in Table 2, which shows that three roots were abstracted, the first and third loading heavily on 1950-60 migration rates, and the second loading heavily on 1970-75 rates. A brief interpretation is that two underlying patterns of change characterized the 1950's, the 1960's represented a transition period, and a new pattern emerged in the 1970's. A short summary of root loadings and their meanings follows:

- (1) Root 1 is a decline in agricultural employment factor in the 50's, distinguishing between declining agricultural counties located relatively distant from metropolitan centers, and more viable non-agricultural counties.
- (2) Root 2 is the growth pattern of the 1970's distinguishing between less viable agricultural or manufacturing counties, low in amenities (specifically seasonal homes), and rapid growth areas rich in amenities with high employment in the tertiary sector.
- (3) Root 3 distinguishes between declining counties in the 50's characterized by high employment in manufacturing located distant from metropolitan areas, and more viable counties in the 50's located close to metro areas. The more distant counties declined despite modest gains in manufacturing jobs.

As in factor analysis, factor scores can be obtained and mapped from the canonical correlation results. They demonstrate that counties loading negative and high on Root 2, the rapid growth counties of the 70's, relatively rich in amenities, are found in three primary locations: (1) the New England seaboard from Maine to Massachusetts, (2) the White Mountain region of New Hampshire, and (3) the Catskill Mountain region of lower New York State. It is precisely such areas, rich in natural attractions, not close enough to metropolitan regions to be engulfed by the urban environment yet not so remote as to be isolated, that epitomize the emergent pattern of growth in the 1970's.

In conclusion, although this analysis is not specifically oriented to policy issues, it does suggest that from the standpoint of economic planning, creating or maintaining a pleasing residential environment may be one key to enhancing long term viability of traditionally stagnant rural areas.

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## ZONES OF LARGE SCALE LENGTH

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It has become generally recognized only within the last twenty years that we operate within definite limits of personal and social distance, which influence our feelings and reactions. (1) The four distance zones identified to date--intimate, personal, social-consultive, and public--have measurable boundaries, which vary according to culture, but which are present in all cultures, and which constrain our behavior. (2) There are indications that, at a larger scale, there are additional zones, as yet not generally recognized; which also have definite measurable boundaries, and which also affect our feelings and reactions. Just as Hall's zones constitute the conceptual framework of proxemics, so it is possible that greater study of these large scale zones of lengths, areas, and networks may yield a framework of use to human geographers as well as sociologists, architects, and planners. (3)

In this paper there is room only to describe briefly one possible set of large scale zones: those of length. We can get some idea of the effects of these zones of length, and of the measurements determining them, from observations of seemingly unrelated aspects of behavior and perception. The evidence comes from highly pragmatic standards for the design of shopping centers, from a sociological field study concerning (among other things) the extent of casual neighboring, and particularly from commonly accepted descriptions of city streets.

The purpose of shopping center design is to foster impulse buying. (4) Everything is made as inviting and easy as possible for the consumer. Rather rigid design criteria and leasing provisions to further this end have been developed on the basis of experience. For instance:

"The walking distance between a car parked at the outer fringe of the parking area and the shops should be 400 feet maximum. Try to limit the depth of parking (to) between 300 and 350 feet from the store group." (5)

Or again:

"Care must be taken to avoid lengthening the strip (of stores) beyond a distance that people walk comfortably. About 400' is usual, though there are examples of successful strip centers of 750 feet and longer." (6)

As a corollary, a sample contract for a store occupying space within a large shopping center has a clause stipulating that the management of the center shall not lease space within a distance of 750' to another store selling similar merchandise. (7) Presumably this is to protect the first store owner from the sort of comparison shopping and direct competition likely wherever stores are close enough together for customers to move freely back and forth between one and the other.

These design criteria yield two definite measurements. One is 400', within which movement seems to take place easily, and essentially without thought. The other is 750' or a little more, beyond which there is a

distinct sense of distance covered, of separation, and, presumably, a noticeable decrease in actual competition. The usual explanations for these limits are that, "ladies carrying packages won't walk further than 400'," and, "people just aren't willing to walk further than 750'." (8) But it is hard to suppose that it is the act of walking itself, even when burdened with parcels, which becomes suddenly tiring at either distance. Rather, the very definiteness of the measurements, and the widespread recognition of the changes of behavior they mark, indicate that 400' and about 750' stand, in our culture, as ends of zones: that they are definite boundaries of the sort we are more accustomed to recognize in much shorter personal distances.

This interpretation is supported by observations made by Herbert Gans in a sociological study of a new Levittown, later named Willingboro, in New Jersey. Gans identified lengths along streets which he called "sub-blocks." These lengths were ten to twelve houses in extent (650' - 800' in that development) and represented the distance within which casual daily neighboring occurred. (9) Obviously there are many other physical and social factors which have an effect on casual neighboring. (10) But again, the fact of such a definite outside physical limit, existing without respect to the number of people in the casual neighboring set, suggests that these "sub-blocks" are another indication of an underlying perceptual organization with an upper zone boundary in the 700'-800' range.

Probably the best evidence for such zones of length, and for the particular distinctions and distances which mark each zone, can be found in our commonplace descriptions of city streets or blocks. In Manhattan, the crosstown blocks of the Upper East Side, between Fifth Avenue, Madison, Park, Lexington, and Third Avenue (which range in length from 400'-424') are generally taken to be short blocks. On the other hand, the crosstown blocks of the West Side (which range upwards of 760' except where Broadway slices them in two) are felt to be noticeably long. This formulation not only accords with the limits found in shopping center design and casual neighboring, but points to an additional zone of length subdividing the distance between 400' and 750'. For, if even 424' makes a noticeably short block, while a length in excess of 750' constitutes a noticeably long one, then at some point between must lie blocks of a normal range of length: ones which are simply blocks, not especially noticeable for their length at all.

One of the characteristics of short blocks, discussed by Jacobs, is that, as we walk along them, we can think of combining them to form chains ((Jacob's "personal neighborhoods") and networks. (11) In other words, it is easy to imagine joining actual streets only 400' or a little more in length with other short streets to make longer entities. By comparison, blocks even 700' long--well within the normal range--seem complete, and even isolated by their own length. We cannot really imagine these longer streets linking together with each other. While they form a grid on a map, this is a paper network only. On the ground, they seem too long to combine. Therefore, the outside zone limit for a short street can be defined as the point at which a street no longer can be imagined combining with another street as we walk along it. By implication, both Jacobs and Speer fix this point at about 500'. (12)

Thus, tentative limits for zones of large scale length would be as shown in Chart 1. These limits start at 10', where social-consultive space ends, for this suggested set of zones is, in many ways, only a further definition of Hall's zone of public space. It too is an attempt to describe and delimit some individual perceptions, feelings and reactions as these are triggered by an essentially public landscape.

TABLE 1  
ZONES OF LARGE SCALE LENGTH

| Zone      | Length in Feet        | Characteristic Place   | Description  |
|-----------|-----------------------|--|--|
| Nearby    | 10-400                | Shopping center parking lot<br>One north-south Manhattan block | Length too short to stand alone satisfactorily<br>Easily combined with other lengths       |
| Short     | 400-500               | Blocks between 5th and 3rd Avenues<br>successful enclave       | Can stand alone<br>Easily combined with other lengths<br>Heightened individual involvement |
| Normal    | 500-750/<br>800       | Gans' sub-block  | Stands alone easily<br>Non-combinative<br>Does not call for individual involvement         |
| Long      | 750/800-<br>1000/1250 | West Side cross-town Manhattan blocks                          | Isolated<br>Individual tends to think of parts of block                                    |
| Grandiose | 1000/1250---          | Versailles Canals<br>Washington Mall                           | Overwhelming scale   |

Obviously, again, many physical factors will affect our perception of the limits of these zones. Among the most significant are: the width of the street itself, the scale of the buildings or openings along the streets, the frequency of cross streets and their width, and setbacks at sidewalk level. The limits of the larger zones will be affected by so many of these and other factors, that the precise definition of zone boundaries, (which is possible not just at the scale of personal space, but even in the shorter of the proposed zones) becomes less possible for the larger ones proposed.

Nevertheless, it is worth noting that there is a category beyond long. Such stretches, like the 1600' of almost unbroken length from the Place de la Concorde to the Place Clemenceau along the Champs Elysees, or the 2000' canals at Versailles, are almost always deliberate exercises in the grandiose. Speer's plan for the rebuilding of Berlin, which would have included an avenue 3 miles long and 400' wide, offers even more extreme

examples.(13) The effect of such designs is to make even individuals in a huge crowd feel at once isolated and insignificant. Any parent who, taking a child to visit our nation's capital, has faced the prospect of walking the (merely) 1000' stretches along or near the Washington Mall, can attest that even these lengths can be extremely daunting--far more so than the same distance interrupted by cross streets.

The importance of these zones lies in what they can tell us of the effect of landscapes that we know only from maps, and of plans before we build them. We know that violation of the zones of our personal space evoke immediate awareness on our part, and frequently involuntary compensatory behavior.(14) The situation itself intrudes on our thoughts to the exclusion of most else, at least temporarily. It seems that the case is similar for zones of large scale length. Lengths between 400' and 500', because they are noticeably short, call for a compensatory response. These are the lengths which support successful street enclaves, those blocks or culs-de-sac where so many inhabitants are members of the block association that any non-member is noticed and felt not to be pulling full weight. Between 500' and 750'/800' lie those lengths that we do not have to notice, which we can take for granted without taking special thought. A landscape which offers these lengths is like an office which maintains comfortable social-consultive distances. In each environment we can turn our attention to our own concerns and get on with our work. All the other zones will, because of their limits, demand more of our attention on certain occasions.

It is inherently no more surprising that we should have limits almost equally definite and measurable for the larger lengths within which we function as well as the shorter ones, and that these limits which define our reactions indicate not just the size but something of the nature of our territories. Man is, at least in some ways, a territorial animal, and we defend what we consider to be our proper space at lengths greater than room scale.(15) When, as is all too common, the inhabited landscape offers only lengths too short, which we are unable to combine with other lengths (or areas too small, cut off from other areas), then we feel, however dimly, cramped and threatened. When, on the other hand, our physical environment reflects the grandiose dreams of others, as at Versailles, we feel overwhelmed by a disproportionate scale. Our quick awareness of such feelings is an indication of the importance to us of zones of large scale length.

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## NEW YORK: IMAGES OF PLACE IN CONTEMPORARY SONGS

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The purpose of this paper is to explore the impressions and images of a unique place, New York City, as reflected in thirty recent popular or "progressive" songs about that city. In his recent discussion of the use of literature as geographical evidence, Yi Fu Tuan made some observations which are as appropriate to music as to literature.

Literature is of course not life: it is a picture or an articulation of life. Its value to science is that it makes certain basic human experiences visible and public...Literature is a child of its time. [It articulates] the inchoate feelings and perceptions of a people, but...also guides and directs these feelings and perceptions. From one viewpoint literature is a diagnostic index or evidence of culture; from another it is a creative force directing culture, enabling people to see their world in new ways. (1)

Human geographers are seeking ways of knowing beyond (or besides) empirical, scientific methods. (2) Recent papers have explored the evidence of art and literature as reflecting perceptions of landscape. (3) The use of novels as a way of seeing the world as others see it is, again de rigeur in geographical teaching. (4)

The contemporary song writer can be considered a vox populi. Records which are purchased by the millions, and the songs which permeate the airwaves both reflect contemporary feelings about place and, in turn, create feelings and attitudes towards place. Obvious distinctions exist between popular songs and literature in that the songs are more ephemeral and are not carefully crafted masterpieces whose production and appreciation usually follows long periods of gestation and the tests of time. In popular songs we may find more fleeting images, but also ones which more closely reflect the common person than the genius. Popular songs are commercial. Thomas Hardy, D.H. Lawrence, Willa Cather, Turner, Constable and others who have reputations as "place artists" did not write or paint to "sell well." They neither anticipated, nor had, a mass market. Aztec Two Step, Bruce Springsteen and Stevie Wonder produce songs which sell fast to millions. Presumably they sell well partly because they express the popular mood, and they also reinforce popular images. Popular music can thus be thought of as a disequilibrating societal force. It distills the sentiments of the people into a stronger brew to which they become addicted, and which affects their subsequent perceptions.

"Place is defined as a cluster of meaning or a focus of human emotional attachment." (5) "Geographers wish to understand not only why place is a factual event in human consciousness, but what beliefs people hold about place...It is this alone that underlies man's acts which are, in turn, what gives character to a place." (6) Clearly, New York City is a place both in the objectively rational scientific view (its empirical indicators distinguish it from surrounding areas to provide evidence of a distinct entity), and from an existential, phenomenological perspective. How is the essence of the place which is New York reflected in songs? What are the quintessential landscape images of the city? What senses of con-

tinuity, attachments, belonging and rootedness in New York are conveyed in popular songs? What qualities does the essence of the place which is New York have?

TABLE 1  
RECENT SONGS ABOUT NEW YORK CITY

| #  | Title                               | Performer                           |
|----|-------------------------------------|-------------------------------------|
| 1  | Midtown Rush                        | Tom Scott & The New York Connection |
| 2  | Goin' to New York                   | Climax Blues Band                   |
| 3  | Living for the City                 | Stevie Wonder                       |
| 4  | Manhattan Skyline                   | John Miles                          |
| 5  | New York Skyline                    | Garland Jeffreys                    |
| 6  | Excerpt from Living for the City    | Stevie Wonder                       |
| 7  | Stranger in the City                | John Miles                          |
| 8  | Pictures of a City                  | King Crimson                        |
| 9  | People of the City                  | Cashman and West                    |
| 10 | New York City/Home                  | J.F. Murphy and Salt                |
| 11 | New York City You're a Woman        | Al Kpper                            |
| 12 | New York, New York                  | Back Street Crawler                 |
| 13 | New York                            | Dreams                              |
| 14 | 59th Street Bridge Song             | Simon and Garfunkle                 |
| 15 | New York Rhythm                     | Barry Manilow                       |
| 16 | On Broadway                         | Eric Carmen                         |
| 17 | New York City                       | Gil Scott-Heron                     |
| 18 | New York City Blues                 | Cashman and West                    |
| 19 | New York State of Mind              | Mark Almond Bank                    |
| 20 | Seventeenth Street                  | Gel Scott-Heron                     |
| 21 | Uptown                              | Loudon Wainwright III               |
| 22 | Lullabye on New York                | Aztec Two Step                      |
| 23 | Talkin' Big Apple '75               | Loudon Wainwright III               |
| 24 | Does this Bus Stop at 82nd Street?  | Bruce Springsteen                   |
| 25 | It's hard to be a Saint in the City | Bruce Springsteen                   |
| 26 | American City Suite                 | Cashman and West                    |
| 27 | Living for the City                 | Stevie Wonder                       |
| 28 | Talkin' New York                    | Bob Dylan                           |
| 29 | In New York Again                   | John Shine                          |
| 30 | Inner City Blues                    | Grover Washington, Jr.              |

In listening to, and reading, the transcriptions of the thirty songs (referenced in this paper by the numbers shown on the above table) perhaps the strongest recurring theme is the ambiguity of attraction and repulsion which is felt for New York City. There is a thirsting, longing for the city:

I ain't gonna rest till I get to New York.  
 I said I'm goin' to New York. I'm goin' if I have to walk. (2)  
 Yet I'm drawn to you like a moth to a flame (11)  
 But the New York skyline, it's calling me home tonight. (5)  
 I'm taking a Greyhound on the Hudson River Line  
 I'm in a New York state of mind. (19)  
 I don't know why, but I wish I was in New York again. (29)

The city also inspires intense topophilia:

New York City, I don't know why I love you.  
Maybe it's because you're mine. (17)  
I think of her [New York], I think of life's own music. (26)

In some cases the topophilic tendencies are so strong that New York becomes anthropomorphized. New York is a woman, a destructive hard bitch; one who entices and tortures but who you can't leave:

Female, feline, feminine, she's been making my world so bright. (5)  
New York City won't you breathe on me,  
Won't you take me in your arms? (10)  
New York City you're a woman,  
Cold hearted bitch ought to be your name.  
Well you ain't never loved nobody,  
Yet I'm drawn to you like a moth to a flame.  
I have sinned with you in my sorrow,  
And I have sinned with you in my shame,  
But you ain't never even seen me, New York City,  
I'm tryin' to beat your game. (11)  
New York City, I don't know why I love you,  
Maybe you remind me of myself. (17)  
When she was good, it was oh, so good.  
You were blessed if she smiled on you.  
You could be a king if she believed your story,  
When it was over she laughed at you. (26)

New York's lovers suffer, however, from no illusions. Virtually every song described the hardness, cruelty, bitterness and depressing nature of New York's environment:

Buildings tower around me like they're waiting for the kill. (7)  
Concrete cold face cased in steel.  
Stark sharp glass-eyed crack and peel.  
Bright light scream beam brake and squeal.  
Red white green white neon wheel. (8)  
Roaches in the woodwork,  
The madmen on the run. (12)  
I'm getting sick of the slums, I'm tired of dodging the bums,  
And the freaks are freakin' me out. (21)  
This place is cruel, nowhere could be much colder.  
If we don't change, the world will soon be over. (27)

Despite these stark assessments of the city, the attraction is still there. New York is loved, warts and all! The conclusion of Loudon Wainwright's "Talkin' Big Apple '75" epitomizes the attitude:

Sure I know New York is dirty and ugly and fulla cockroaches  
and gonorrhoea and rats and junkies, hookers, rude cab drivers,  
bad air and bad vibes and unemployment and they don't pick  
up the garbage. Ah, but it's not boring. (23)

The absence of ennui is perhaps one of the main attractions of the city. Several songs celebrate the feast of stimulation and activities in the city:

In the funky dives, on the old West Side  
There's always something going down. (15)  
They say there's always magic in the air. (16)

The sounds of the city transport you around the sun.  
 The music of every nation helps make the island one. (17)  
 If you're lookin' for excitement,  
 You need only look next door. (20)  
 Well, let's go fly a kite in Central Park  
 Go and see a Shakespeare play.  
 Have a lot of fun at the Planetarium,  
 And museum all the blues away.  
 Well Rockefeller Center, and the U.N. too,  
 Baby, don't make me wait.  
 I want to elevate up and down with you  
 In the building of the Empire State. (21)  
 Well you can dance at the Limelight, any time after midnight,  
 If you dress up like Marcel Marceau. (22)  
 They got skyscrapers, subways and a sea of humanity:  
 Museums, libraries, culture galore.  
 They got cable T.V.--How could you ask for more?  
 And if reality is your cup of meat,  
 They got 42nd Street. (23)

Whatever else New York is, it is neither peaceful, nor dull.

Relph, in a compelling discussion of place and placelessness, writes that "The spirit of a place lies in its landscape." (7) As reflected in popular songs, this does not seem true for New York. Although elements of New York's landscape are mentioned with some frequency (skyscrapers, neon, subways, garbage cans) and the overall landscape is encapsulated as a "concrete island" or a "concrete jungle," it is, rather, people and their activities which epitomize the spirit of the place. People, in the songs of New York, are both perpetrators of pain and fellow sufferers. They, like New York, are replete with antithetical qualities. They are cruel and unfeeling:

People walk right over me, now they don't give a damn. (7)  
 And you won't hear the sounds of laughter,  
 City people rarely smile. (9)  
 Yes, I live my life with strangers,  
 And the danger's always there. (15)  
 But if you value your life  
 Carry a gun and a knife..and a fork. (22)  
 A junkie steals, a beggar deals, who knows what's comin' next. (26)  
 Now a very great man once said  
 That some people rob you with a fountain pen:  
 It don't take too long to find out  
 Just what he is talkin' about. (28)

But they are also loving and caring:

Watch them fill the blind man's cup; and although they  
 know he sees them, he's always got enough. (9)  
 Its home to both tramp and artist  
 And dreamers from everywhere.  
 But most of all kind hearted people  
 Whose stories ain't on the air. (17)

The psychopathology of urban life is exemplified in these songs. They sing, though not in Milgram's words, of alienation, anomie, overload and stress. But they also sing of tolerance:

Well you can do what you want

No, its not like Vermont, in New York.(22)

and survival:

I'm lost, I'm found. I'm up, I'm down.  
But somehow I survive.  
It's got to be the New York City rhythm in my life.(15)

and even hope:

Apartments full of hope and second tries.(10)  
And Mary Lou, she found out how to cope:  
She rides to heaven on a gyroscope.  
The Daily News asks her for the dope,  
She says, "Man, the dope's that there's still hope."(24)

Recent punditry concerning the death of New York inspires denial:

Like to many others, I found it all too easy  
To stand off at a distance and criticize.  
But there ain't nothin' wrong with the city,  
Just some people been wrong there like everywhere else.(17)  
And the papers they love to say  
It's the meanest town in the U.S.A.  
But I think it's okay.(18)  
Well, the mayor is a mayor called the Mayor Abe Beame  
And they dreamed up this here Big MAC scheme.  
Well that big scheme kinda petered out  
And President Ford had to bail them out.  
I don't think his heart was in it though...  
Meet a whole lot of people out there that put New York down.  
Course, half them people ain't never been there,  
So some of that criticism just ain't fair.(23)

Even mourning New York is not unmixed with a glimmer of hope:

I never felt so lonely and so helpless.  
I'm wishing that I didn't know the truth.  
But they tell me that my friend is dying,  
Oh, New York City, can you say it ain't true?  
Can you tell me now before I'm leavin' you?  
I'd give everything I own just to believe in you...again.(26)

"Literature mirrors the ambiguity, ambivalence, irony, paradox, and misunderstanding that frequently plague real life."(8) These qualities are reflected in the contemporary songs about New York. For one ignorant of, or even unsympathetic to this music, listening to it can evoke images, insights and understanding of the place. New York, New York, it's a helluva town!

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## SHIFTING LOWER MANHATTAN GHETTOS

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On September 29, 1976, in the community hall of St. Patrick's Church in Lower Manhattan, M.B. Lee, representing the Chinatown Improvement Council, and Y.T. Huang, of the Chinese Chamber of Commerce, quarreled bitterly with John Zuccotti and Victor Marrero of the New York City Planning Commission. At issue was a zoning proposal designed to maintain the character and street ambience of New York's Little Italy, concentrated along Mulberry Street to the North of Canal. The ordinance would encourage convenience stores and cafes and would end demolition or changes of the facades of neighborhood buildings. The Chinese argued that such preservation zoning was reactionary, because Chinatown, traditionally South of Canal Street, was already expanding over Canal into Little Italy. The numbers of area Chinese are growing rapidly, while many Italians are leaving Little Italy. The proposed zoning would be economically disadvantageous to the Chinese residents and merchants, they argued, because it could hinder the expansion of the Chinatown street character which attracts tourists to Chinese specialty shops and restaurants.

It is ironic that this quarrel between Chinese and Italians over "turf" should have taken place in an old church still dedicated to the patron saint of Ireland. The church silently testifies that the history of many a New York neighborhood is a series of ethnic replacements. The history of this area and the expansion of Chinatown today well illustrate the kaleidoscopic nature of patterns of immigrant ghettos, contemporary street-scene cultural geography, and the political manifestation of cultural geography when local planning and zoning powers are at issue. (1)

Today's Saint Patrick's Church, facing Mott and backing on Mulberry just a few blocks north of Canal, was begun as the Cathedral of New York in 1809. This was one year after Pope Pius VII created the Diocese of New York. The site was then at the edge of the city, surrounded by cornfields and meadows, but already by 1815, when the Cathedral was dedicated, the Cathedral stood in the nucleus of an Irish immigrant ghetto. New York's first Bishop was John Connolly, who came over from Dublin. In the 19th century, Roman Catholics in the United States faced bitter prejudice, and several times Protestant mobs attempted to burn down the Cathedral. Stout men of the Ancient Order of Hibernians successfully defended New York's Cathedral against such attacks in 1835 and again in 1844, when Roman Catholic Cathedrals in other East Coast cities were put to the torch.

The Catholic Irish were victims of prejudice here, but the possibility of jobs pulled them anyway. By 1845 New York City had 70,000 Irish residents, about 15 per cent. of its total population. Famine in Ireland in the late 1840's and early 1850's added a push factor, and in 1860 New York City was 25 per cent Irish. About that time the Irish had begun to think of building a larger Cathedral on some land earlier purchased for a cemetery far uptown. The northerly growth of the City had developed a fashionable neighborhood around that site, and so a new Cathedral on Fifth Avenue between 50th and 51st Streets was contracted in 1858. That new Saint Patrick's was dedicated as the Cathedral of New York in 1879, and old St. Pat's was demoted from Cathedral to parish church. The 27 years from 1858-79, however, saw continuing expansion of the Irish Lower East Side. In 1863 Irish Catholics purchased the First Presbyterian Church, built in 1841 in a Scottish section neighborhood three-quarters of a mile southeast

of old St. Pat's, and rededicated it as the Roman Catholic Church of St. Theresa. The Scots had beaten the Irish in moving uptown, to Fifth Avenue and 11th Street.

Toward the end of the 19th century, just as many of the more successful Irish were moving uptown or over to Hell's Kitchen in the West 40's, Italians began to settle near the Irish Lower East Side. By 1900 the congregation of St. Pat's Church was about one-half Italian. As late as 1909 the president and eleven directors of the Saint Patrick's Church Society bore Irish names; the twelfth was Mr. Louis De Guato, but by 1914 area Italians overwhelmed Irish. Little Italy was firmly established along Mulberry and Mott with Mulberry the principal thoroughfare.

Meanwhile East European Jews were pouring into the neighborhoods to the East in the 1880's and 1890's in such numbers as to make it the most densely populated urban district in the world. By 1894 the population reached 986 per acre. In spite of their poverty, these people established over 500 synagogues and religious schools, a theatre, and book and newspaper publishers in the area. The number of Roman Catholic communicants at St. Theresa's dwindled. With the passage of restrictive immigration laws in the 1920's, the tide of Jewish immigration stemmed. Jewish families eventually moved up the economic ladder and to better neighborhoods, but a concentration of Jews and of Jewish institutions remained in the Lower East Side.

Also in the second half of the 19th century, Chinatown was developing to the South of the Italians and West of the Jews, with Mott Street the principal thoroughfare. The first Chinese had settled in New York in the 1840's, and although Chinese immigration was restricted by the Chinese Exclusion Act of 1882, there were more than 1,000 Chinese in New York's Chinatown by 1887.

In the late 1960's two demographic changes combined to breach the older ethnic boundaries. One was the continuing relative emptying-out of Italians and Jews from the Lower East Side to other parts of the metropolitan region. The other was the sextupling of Chinese immigration to the United States as a result of the new immigration laws of 1965. By the late 1960's some 10,000 immigrants were coming to New York's Chinatown per year. The 1970 census recorded 78,000 Chinese New Yorkers, and there are probably over 100,000 today, about one-half of whom live in Chinatown.

Chinatown could not adequately house this influx. In 1969 the official Plan for New York City described 34 per cent of Chinatown's housing as "dilapidated;" only one new residential building had been constructed since 1939. New residential construction has occurred within the traditional borders of Chinatown since 1969, but obviously Chinatown has also had to expand. Expansion to the North and West has meant spillover into Little Italy, and many Italian landmarks are already surrounded by Chinese, or are themselves changing hands. Bicigalupo Funeral Home, at 36 Mulberry, long a Little Italy landmark and visually familiar to millions who saw it in the movie "The Godfather" is now the Ng Fook Funeral Parlor. The statue of the Virgin Mary which stood in the window has been replaced by her counterpart, Kwan-yin, the Goddess of Mercy. The centerpiece of the Italian restaurant row on Mulberry Street is now the Sun-Mee Bean Sprout Company. Examples of changes in the street scene could be multiplied.

Equally fascinating is the street scene to the East, as Chinatown expands into the formerly Jewish ghetto. The Church of St. Theresa is still there, offering masses today in English, Chinese and Spanish, for the growing

Hispanic population expanding into the area from the Northeast. Many Jewish landmarks are being adapted by Chinese. Number 175 East Broadway, a citadel of Jewish thought and culture since 1912 as the home of the Jewish Daily Forward, has been purchased by a Chinese merchant, and it is being converted to Chinese community uses. The Forward, the world's only Yiddish daily, has moved uptown to East 33rd Street. Historic 165-67 Henry Street, original home of Rabbi Jacob Joseph School, the first Hebrew parochial school in the United States, is now Chinese-owned and is being converted into apartments for Chinese families. Farther east on Henry Street, the famous Settlement House still aids the poor and sick, but today its clients are largely Hispanic and black.

It may seem incredible that a single street or single block can be of a distinct character, but all sites mentioned in this paper are within one square mile. Extreme cultural pluralism continues to characterize this part of New York City and provides ample evidence of the historic processes of expansion, contraction and replacement of ethnic ghettos. It may be doubted whether preservation zoning can counteract these demographic pressures.

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## THE BOUNDARY EFFECT AND THE NIAGARA FRONTIER

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The international boundary at the Niagara River between New York in the U.S. and Ontario in Canada presents an opportunity not only to study the result of the boundary effect on highly populated, highly developed areas on both sides, but also to study the historical process by which European culture began to imbue a natural physical feature, the river with meaning as a boundary. (1) This study contrasts the cultures which did not see the river as an apparent boundary, and those that did and do today perceive it as a boundary barrier. It outlines the results of the boundary process on the nearby areas, comparing and contrasting physically similar areas.

In making this study, I have applied and adapted vocabulary from John Nystuen, who wrote on boundaries in 1967, and have added some terms of my own. (2) The term reflection, used by Nystuen, describes the boundary effect in the turning away of a vector by a barrier. This barrier is often seen and represented as a line or an edge, e.g. in the case of the international boundary, the end of a thick sovereignty. Nystuen is concerned with permeability, the ability of certain vectors to penetrate a boundary, on a select or qualified basis: the boundary is in fact semi-permeable. Penetration of a boundary may be divided into two classifications: those local effects which seem to result from mere adjacency; and transit, the crossing of the boundary which takes place at a particular point or along a certain length of boundary (but which originates or terminates deeper within the nation state). We are also obliged to look at the directional aspects of boundary which are the results of 1) nature, in this case the Niagara River; 2) culture, the historic traditional perception of the boundary itself; and 3) the mode of the vector involved.

One can hypothesize the ultimate boundary situation on the Niagara Frontier as consisting of both elements of exclusivity and permeability. The boundary is an accepted international boundary which one does not cross unaware: the places of crossing are marked by the topography (the river) and the modes available to cross it. Movement by boat, rail, automobile (and insofar as relevant, air) across the boundary is vitalized and institutionalized by customs and immigration officials, which to some extent create impermeability; there are certain activities and goods, notably liquor, which are affected by this act of crossing the river. Also of course, because what we consider the security of our persons and property has led to this exclusiveness of sovereignty, the border is reflective and creates a zone of avoidance for psychological reasons.

My study has for research purposes focused on two main formal political/administrative regions: the Buffalo, New York SMSA, which is contiguous with the Niagara River boundary, and Niagara Region, Ontario, between Lake Ontario and Lake Erie.

The Niagara River, technically a strait, connects Lake Erie and Lake Ontario. Its flow is fast and made naturally unnavigable by its two hundred foot plunge over the Niagara escarpment at Niagara Falls.

The Niagara River as boundary is a part of the European conception of nationality which views sovereignty as exclusively filling space and ending abruptly at a mutually recognized line. (3) In pre-European times

Indian tribes used the river and its environs. Their spatial patterns were nodal, i.e., centered on villages, rather than occupying space. Villages were high and off the main routes of transportation in order to be more easily defensible. The river did not serve so much as a boundary as a medium of connection between the two shores.

Although it seems probable that the river served as an activity space barrier for Indians on foot and their non-swimming animal prey, the Iroquian language and Iroquoian tribes flourished on both sides. The river seemed not to be an important barrier or boundary in pre-European contact times.

With the coming of the first Europeans, the French, the river took on a different meaning: the French were interested in connectivity at a larger scale; the river was to be traveled its length from north to south. The Falls became a perceived barrier to transition from Lake Ontario to Lake Erie. It therefore presented at least two definite locational problems: defense of this north-south passage, and a way to get around the falls, a portage. Thus, the land near the river took on new meaning and a greater definition. Fort Niagara was established to guard the north entrance to the river and the portage around the Falls. The French were concerned with long distance travel and protection of this narrow connection in their string of nodes on the North American Frontier. For them the water was a prime mode of transportation. (4)

For some fifty-one years after the American Revolution, the boundary hardened into its present state of acceptable solidity. At first, Fort Niagara on the eastern side of the river at the entrance to Lake Ontario was a gathering place for those fleeing the American revolutionaries, a British outpost on the frontier. These Loyalists then funneled to the opposite bank where they were diffused south along the river, settling as close as possible to the river boundary which was formalized in 1794-96. Safely behind the moat-like boundary, these settlers' separateness was accentuated by the creation of the province of Upper Canada, separate from Quebec, in 1791, with its capital at Newark, on the Lake Ontario shore opposite Fort Niagara.

When this boundary was actively violated in the War of 1812, populations were dispersed by burnings on both sides, starting with the American burning of Newark. In the end the British occupied Fort Niagara, and the Americans Fort Erie, both opposite their own shores, at the river's mouth and head, respectively. The Treaty of Ghent settled the boundary as it had been, in the river.

In the meantime changes elsewhere in both countries made the Niagara Frontier boundary less explosive; growth had been reflected, or perhaps more accurately, deflected away from around the frontier boundary. The capital of Upper Canada (Ontario) was removed from Newark to York (Toronto) astride a growth vector that ran from Montreal, along the north shore of Lake Ontario and southwest toward Windsor, and filled up the southwestern part of Ontario. Population on the western shore of the Niagara grew at a lesser rate; immigration from and through New York declined, and that spilling over from the direction of Toronto increased. Nodes began to elaborate away from the river.

St. Catharines, Ontario, some ten miles west of the Border, grew rapidly after its founding in 1825, and a string of places grew along the Welland Canal, which traversed the Canadian side from North to South paralleling the Niagara River. Other strings of places grew along roads oriented west toward the main Southwest-Northeast axis of Canadian settlement. (5)

Thus, to some important extent the Niagara peninsula area of Canada could turn its back on its neighbor.

From 1825 on, Buffalo grew as the terminal of the Erie Canal. Through Buffalo flowed much of the population and commerce to Lake Erie and west. Buffalo grew as the break-in-bulk point of change from canal barges to lake boats. Americans crossed here frequently in the early nineteenth century to take up what often became permanent residence in nearby Canada. The Niagara peninsula of Ontario, of which the present Niagara Region is the larger part, became the home or stopping off point for immigrants from the U.S.-Mennonites, Quakers, Pennsylvania Dutch, made their first stops in and near St. Catharines, some ten miles inland. Black slaves arrived in Buffalo and other border cities via the underground railroad to take up freedom in St. Catharines. The border was still perceived as permeable by Americans. Americans went into business across this boundary, often founding and operating local mills and later factories. On the other hand, the nearby New York state market and the population center at Buffalo provided a strong market for the mixed farms and later fruit farms of the Ontario Peninsula; this obtained until well into the twentieth century.

Even today, the proximity of the large center in Buffalo has created an international spill-over of population into the nearby Niagara Peninsula. Americans have purchased the amenity of much of the Canadian lakeshore for water oriented recreation, to the extent that cottages have cut off the Canadian population from their own shores. It is only in recent years that an increased spirit of nationalism and awareness of this vast summer weekend permeability has grown among Canadians who actively resent this intrusion.

The Niagara River boundary thus presents a case history of the Western idea of nationalism, and its effects on local landscapes. This study of the boundary is now being elaborated in a collaborative study with a Canadian geographer, John Jackson, attempting to present both perspectives on this busy frontier.

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## DECENTRALIZING POLICE SERVICES: A FEASIBILITY STUDY OF SYRACUSE, NEW YORK

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In November 1976, a team of four Syracuse University faculty members was convened to investigate the advisability of a comprehensive Syracuse Police Department (SPD) reorganization, and to provide a set of recommendations as to what new organization would best suit the needs of the SPD. Over the next eight months, we evolved a set of organizational alternatives which the police were urged to evaluate.

This paper cannot describe that entire study, nor even the range of solutions offered, but rather is a reflection on that general process of applied geography, of our study and interaction with personnel of the SPD, and perhaps of some intimations of police thinking on modern police problems.

There seemed to be several distinct phases in the work, which are likely to be encountered in any applied work in geography. These were: 1) police (or client) statement of the problem, 2) a phase of re-conceptualization, 3) goal formulation, 4) identification of critical variables, 5) formulation of alternative solutions, and 6) translation of findings and recommendations, reviewed below in turn.

1) Police statement of the problem. What, after all, were the police looking for? They suggested that research should be carried out to evaluate the feasibility of the SPD implementing some form of "zone patrol", a term taken from the notion that modern police thinking follows a zone patrol theory. Zone patrol theory, perhaps surprisingly, has rather much to say about "police zones", but rather little on the subject of "patrol". The corpus of that theory remains elusive.

The police problem was stated in non-scientific and non-operational terms. The idea of policing "neighborhoods", for example, figured prominently in the language of their original proposal. Readers of the urban geographical literature on neighborhoods will be familiar with the four or five definitions of that term used by both professionals and laymen. The translation of such terms was called for.

Another feature of this first-exposure phase of the work was important. A certain number of the questions posed in the SPD grant proposal required answers whether or not the team deemed them significant for the reorganization study. The police, for example, needed a statement on the utility of certain census materials for ongoing police work. Although these materials did not integrate well into our study, specific answers had to be obtained.

2) Re-conceptualization. After initial contact, a prolonged phase of re-conceptualization took place. This involved principally (i) a rooting out of operational terms and goals, and (ii) probing for meaning in police terms which had no apparent significance. In particular, a certain ambivalence could be found in the police position as to whether an organization should be designed around a predetermined, desirable pattern of deployment of officers into the city, or whether organizational imperatives within the SPD should dictate the pattern of deployment. What was certain was that both issues were important. This organization/deployment dichotomy, incidentally, bore remarkable resemblance to the structure/process dichotomy within the social sciences and geography in particular. While it might be

accurate to remark that geography has been unable to fuse together these two aspects or views of reality, no such luxury of failure existed within the confines of a specific applied question. The argument is, one supposes, that the development of geographical theory remains an important goal for the field.

In this phase of reconceptualization, we learned that zone patrol theory was an argument for police decision-making decentralization, and that undue amounts of authority had accumulated at or near the top of the police bureaucratic hierarchy. This increased volume of information flow throughout the organization, and delayed decisions which in many cases could not bear the delay.

Then too, in the middle echelons of the command structure, authority was vested in positions on a temporal basis, in which case the command officer could not be held accountable for poor decisions which affected problems at times other than under his command. Moreover, community leaders within the city found no simple avenue for reaching those with decision making capacity; and the police, on the other hand, had to assemble the entire corps of middle level officers to meet with non-police officials, on matters of their mutual concern. Command structures, then, were excessively partitioned.

In sum, we were angling toward a solution which would provide an area-based responsibility for decision-makers, where decisions bore a 24-hour meaning. This is the "zone" of the zone patrol theory. We were looking for a decentralized police command, which connotes not so much a decentralization of physical structures (as a precinct organization implies) but rather pushing the decision-making responsibility down the chain of command, and even into the street. An ultimate implication of this argument is that the street cop is relieved of the syndrome of "respond-refer-and-report" to the more responsible position of "respond-and-decide".

3 & 4) In the third and fourth stages of the project, which I called goal formulation and measurement of critical variables, different sorts of questions emerged. Namely, what form of problem-solving posture do we adopt? Since we were charged with improving, or making better, or even finding the best police organization for the SPD, it seemed reasonable that we had a problem of optimization. In simple analytical terms, this is a problem of the programming sort (as in linear programming, or integer programming). Such techniques, I might again editorialize, are terribly useful in applied work, not so much as mathematical routines to which data are subjected, but rather more generally as guides to thinking about the problem structure.

In this case, the idea of linear programming suggests that optimization problems proceed by identifying an objective function (the thing to be optimized) and by identifying a set of constraints within which the optimization will take place. This meant that our problem was to minimize the flow of information throughout the police organization, by minimizing the bureaucratic span between those involved in the decision, and by minimizing the number of bureaus in which a decision responsibility is to be found. As an illustration of this latter point, for example, no fewer than four bureaus had a hand in decisions concerning SPD community relations. Among our recommendations was one suggesting a centralization of this function. On the question of manpower deployment, another optimizing task was to be found. The task as we saw it was to optimize the match between the demand for police services and the deployment of the street force in time and space.

But these optimizing solutions were subject to a fairly large number

of constraints. On the deployment side, police are to be deployed into beats, areas which are thought to be of such size as to equal the amount of area which one patrolling unit can cover adequately in an eight-hour watch. The beats ideally should be free of barriers to internal movement to facilitate rapid response to calls for police assistance. They should furthermore coincide with neighborhood boundaries. The idea here, incidentally, is that sharpened local area assignments for the patrolling officer would result in a clearer definition of officer responsibility and accountability, and would raise officer interest and morale by allowing him a certain stake in community affairs. Beats should have equal police workloads, to ensure a reasonable balance between the time spent responding to calls, time used for crime deterrence activities, serving warrants, backing up officers in adjacent beats, and so on.

The notion of contiguity is fundamental to the deployment scheme. Each beat is combined with a contiguous one to form a team area or subzone. A team is a ten or eleven man unit under single command which assumes a 24 hour responsibility for the two-beat area. (I might note here that it takes at least 10 men to cover a two-beat area on a 168 hour work week, allowing for a 40 hour work week per man and other routine absences). These combined beats, therefore, are further constrained in that team areas must be formed which exhibit the same favorable properties of those of beats previously described.

A more limited range of constraints on the internal organizational side of the project might be described, but as I had rather less to do with this aspect of the reorganization scheme, I can simply summarize these by noting that internal reorganization must take account of a rather natural resistance to change, since reorganization of existing institutions carries threats to particular jobs of particular people. Actually, SPD cooperation with team members was better than expected, and resistance far more muted, perhaps because of a genuine belief down the line that the reorganization could help.

Our reading on these matters was taken from a set of answers to questionnaires distributed widely through the SPD, and personal interviews with key figures in the organization. On the side of deployment, measurements were obtained from extraordinarily high quality data on crime and other matters which consume patrolman time. For those interested in the measurement question, the demand for police services was measured as the combined police times spent in (i) responding to calls for assistance, (ii) time spent in investigations, (iii) time spent in matters of an administrative nature, (iv) patrolling time, (v) time spent in junior highschool and senior highschool surveillance on a regular basis, and (vi) a rather complicated measure of queuing, a measure taking into account the harrying effect of the piling up of calls at particular times of day in particular locations within the city. These data were among the most useful in designing the beats and subzones of the city.

5) In the fifth phase of the project, the formulation of solutions, two broad thoughts guided the structuring of our recommendations: (i) that whatever forms were finally adopted must be easily understood, and simple to administer, and (ii) the solutions should not have an "either/or" or "take it or leave it" tone. Rather, each should represent a particular stage in a final implementation program, so that the department could "evolve" toward a best overall structure and deployment, by phasing in aspects of the total solution, each phase improving the system beyond that which was being replaced.

The appearance of the solutions finally adopted by the project for

final recommendation to the SPD were of this form: a variable beat structure of 30 beats was laid out, and defined in such a way that they were simply combinable into 15 team areas. Thus each 10 or 11 man team was assigned area responsibility for a team area to be patrolled by a single car during the less busy times of the work-week, and to be patrolled by two units, one to each beat within the team area, during the busier times of the week. Generalized work timetables and area assignments were developed to ensure that the same officer within the team worked the same area within the same watch or shift each week. To my knowledge, this is the only variable beat structure designed for an urban police department within the United States, and happily the idea has been rather well received, according to preliminary reports.

The recommendation, then, was that this variable beat structure be brought in at first opportunity, to be augmented later by a two, three, four or five zone structure overseeing different areas of the city. According to the plan, the implementation of the zones could be accomplished on a phased basis, moving first to the two zone model, then to a three, and so on, although it was the team's belief that the three zone model for Syracuse represents the best blend between the needs for decentralized and centralized police functions. Appropriate internal organizational schemes were laid out, to parallel the zonal structures adopted.

6) Finally, and by way of partial summary, a package of overall team findings was presented in such a way as to remove the social scientific tone of the work, to re-translate materials and findings into the terminology originally translated into our more conceptual language. I would like to suggest here that the importance of this re-translation should not be underestimated since, as McLuhan once suggested, the medium (here the medium of expression) is the message. The client is typically far less interested in the analytical process, in the rationale for procedures, than in the bottom line.

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## THE SCHOHARIE COUNTY COOPERATIVE PROGRAM: A CASE STUDY IN APPLIED GEOGRAPHY

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In 1975 the Schoharie County (New York) Planning and Development Agency and the Department of Geography, State University College at Oneonta, New York, entered into an arrangement called the Schoharie County Cooperative Program. Under this, several different projects in applied geography have been undertaken by the department of geography for the planning and development agency. One major project has been the development of a county-wide computerized environmental information system. This system allows the planning and development agency to produce detailed maps covering a wide selection of environmental topics, to determine the best locations in the county for various activities based on certain defined conditions, and to analyze the location and spatial distribution of environmental data. This paper is a report on the development of this information system.

Schoharie County is a large, rural county located on the northern edge of the Catskill Region in Upper New York State. It faces the problems of high unemployment, decline in agricultural production increase in absentee ownership of land, and demands on its water resources from the New York Metropolitan area. Many planning decisions related to these problems must be made at the county level but often these decisions are based only on empirical information tinted by emotional feelings. Factual information is either not readily available or not in a format easily interpreted. The major objective of this information system is to provide the county with a means to ascertain environmental data fast and in a format easily understood so that county officials can make informed decisions.

To support the development of this information system under the cooperative program, the planning and development agency has provided funds through the Comprehensive Employment and Training Act (CETA) for two full time positions and the geography department has furnished technical assistance and computer facilities. All work on this project has been done at the geography department where an office has been provided for this cooperative program. The facilities provided by the department have also included its computer graphics laboratory which has a 30 inch off-line Calcomp Digital Plotter and a 40" x 60" digitizer interfaced to a keypunch. The laboratory also possesses a large software library.

### GEO-DATA BANK,

This environmental information system consists of two major components: a geo-data bank and a computer software system designed to work in conjunction with the data bank. The geo-data bank is organized to contain specific environmental data and uses a grid network to specify the geographic location of data. The data fall into four main categories: topographic, land use, cultural, and soil. These categories and the specific variables associated with them have been determined on the basis of the character and the needs of the county. None of these data have been collected firsthand but have been extrapolated from secondary sources, namely maps. The topographic data which consist of elevation, slope, aspect, and relative relief were acquired from the United States Geological Survey (USGS) maps at the scale of 1:24,000. Actually, only elevation data were collected from the maps. The other topographical variables were calculated from the elevation data. Land use data were taken from the land use maps prepared for the

Temporary Commission to Study the Catskills. (1) These maps are also at the scale of 1:24,000 and correspond in coverage with the USGS maps. These maps are based on data taken from 1973 aerial photographs. Only area type land use data were taken from these maps and these data strongly reflect both the natural and man-made vegetation patterns found in the county. Cultural data were acquired from the New York State Department of Transportation (DOT) updated maps of the USGS maps at the scale of 1:24,000. The most recently updated DOT maps covering the county are for the years 1968-69. Cultural data include such items as roads, cemeteries, transmission lines, and other man-made features which are relatively fixed on the landscape. Soil data have not been included yet in the geo-data bank. Under a second project for the planning and development agency new soil maps are being made from the 1969 soil survey maps done by the Soil Conservation Service. (2) These new maps will be at the scale of 1:24,000 and at the same coverage as the USGS maps. Once these new maps are completed the soil data will be extrapolated from them rather than from the original soil maps. The data maintained in this geo-data bank represent basic information needed in much of the work done by the planning and development agency. Also, because of the nature of these data, they are not likely to change rapidly; thus, the frequency at which the geo-data bank is built on a uniform grid network with the basic grid cell being  $1/16 \text{ km}^2$  or approximately 15-1/2 acres. The location of the grid cells corresponds to the predefined Universal Transverse Mercator (UTM) geographic reference system. By employing the UTM system this geo-data bank can be incorporated into other information systems using this standard grid network such as the New York State Land Use and Natural Resources Inventory. (3) Also, by using the UTM geocode system it is possible to aggregate grid cells into larger cells such as  $1/4 \text{ km}^2$ ,  $1/2 \text{ km}^2$ , or  $1 \text{ km}^2$ . The size of the basic grid cell in this information system provides enough spatial detail in this rural area to meet most of the requirements of the planning and development agency and allows the overall system to be manageable in respect to data processing operations. To cover the county at this scale approximately 26,000 grid cells are needed. For each grid cell 152 pieces of data relating to the previously mentioned categories of topography, land use, cultural features, and soil are being collected and placed on a magnetic tape file. Each grid cell is handled as one record on the tape file and each record is organized as an array to hold the data pertaining to each cell. Consequently, it is quite easy to retrieve a certain piece of information for any grid cell. Only the correct UTM geo-codes for the grid cell and the array element number of the data are needed.

For ease of handling the geo-data bank is organized as one large rectangle with its dimensions being determined by the boundaries of the four sides of the county. The grid network extends across this rectangle to cover areas both inside and outside the county and forms a matrix of 213 rows by 185 columns. All grid cells outside the county are identified by a flag value in one of the array elements of the grid cell records. This type of organizational structure makes it possible to expand the geo-data bank to incorporate areas not in the county. In fact, topographical data are available for all grid cells in the present geo-data bank.

#### COMPUTER SOFTWARE

The computer software component of this information system consists of two major computer programs. The first program which is written in COBOL is designed to retrieve data fast and efficiently from the geo-data bank and to create an input data file for the second program. Since an individual file record exists for each grid cell in the geo-data bank, the number of input-output operations between the file and the working memory area of the computer ranges in the thousands. Generally computer languages

which are scientifically orientated, such as FORTRAN do not handle large numbers of input-output operations efficiently and fast. COBOL, a data processing language, is designed to work with large amounts of data and to manipulate data files requiring numerous input-output operations. The input data file created for the second program has only 213 records in comparison to the 39405 records needed to cover all the grid cells in the geo-data bank.

This first program also allows certain basic mathematical and conditional operations to be performed on one or more of the variables in the geo-data bank. This option allows new variables to be developed from existing variables in the data bank and greatly enhances the potential use of the data bank. The mathematical operations include addition, subtraction, division and multiplication. These operations can be performed between an outside constant and a data bank variable or between two data bank variables. Up to nine sequential mathematical operations can be handled by the program. Conditional operations are designed to allow comparisons to be made between values. These operations are expressed as "greater than", "less than", and "equal to". The program can also handle up to nine steps of conditional operations. To illustrate the use of these operations, the planning and development agency recently wanted to identify potential winter feedlots for deer. During the winter deer collect on heavily forested slopes with southern exposures in order to find food. The geo-data bank has information on slope, forest coverage, and aspect. By using conditional operations it was possible to identify all grid cells which possess all of the following conditions: slopes greater than 10 percent, forest coverage greater than 10 percent, and either southern, southeastern, or southwestern exposures.

The second computer program, written in FORTRAN, reads the output file of the first program and creates a line printer map based on the data from the file. This program has many options common to other mapping programs. It possesses a symbol package which allows a user the option to employ the standard symbol set provided by the program or to develop his own symbol set. A text package permits the user to submit as much textual material as desired. The legend package is organized to handle up to ten map categories and gives the user the option of four methods for calculating map categories. These four methods are: equal interval, arithmetic, geometric, and unequal interval. These options give the user considerable capability in respect to the decision making processes associated with the construction of a map.

On the line printer maps produced by this program, one printer character is equal to 4/5 of a grid cell or 1/20 km<sup>2</sup>. A one to one relationship between the map's printer characters and the geo-data bank's grid cells is not feasible without major map distortion. The dimensions of a printer character are 1/8 of an inch by 1/10 of an inch which makes it an oblong rectangle versus the grid cell which is a square. To accommodate this situation each row on the map has been expanded.

#### FUTURE DEVELOPMENTS

Plans exist to develop additional software for the system. A program which would allow a user to examine subareas of the county would be helpful to the agency. Many studies and presentations made by the agency deal with subareas within the county. Maps and data covering the entire county are of limited help when the agency has to make such studies and presentations. Another program under consideration would allow maps to be produced on a digital plotter. Maps generated on a digital plotter are not as crude looking in appearance as line printer maps; thus, a person looking at plotter

maps might find them easier to relate to than line printer maps. However, line printer maps cost less and require less computer time to construct than do digital plotter maps. This program might be used only to create maps for major presentations and final reports. In addition to this user oriented software, programs based on environmental models related to specific data in the geo-data bank are being considered. These models would produce auxiliary information for the geo-data bank. At present, models to simulate ground water and solar insolation are being explored. Ground water information is needed to assist the county in its decisions concerning the demands on its water resources and solar insolation data may help the many non-county residents who insist on constructing second homes in very remote sections of the county where electric facilities are not readily available.

Since this environmental information system is still in the developmental stage, it has not been handed over to the planning and development agency for its use yet. Some maps have been produced for the agency by the system but it is too early to draw any conclusions about the impact of the system on the planning problems and decisions faced by the agency and by county officials. However, the agency seems to be quite pleased with the results thus far provided by the system. Based on the present rate of development, the geo-data bank and the presently developed software along with documentation should be ready for the agency by next year. The actual operation of this information system will continue on the college's hardware until the agency finds adequate facilities at the county level to handle the system.

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## IMPLICATIONS OF APPLYING GEOGRAPHY

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### INTRODUCTION

An emerging trend in contemporary geography is the application of geographic knowledge and expertise. This trend is being reflected in a number of ways, including an increased involvement of non-academic geographers in all aspects of the discipline, an effort by geographic societies and associations to give new status to applied geography and a concomitant increasing outlet for applied geographic research. (1) While applied geography has a long history, the new trend differs from the previous tradition in its unprecedented concern for rigorous method, its benefits from new technology and its impact on geography curricula change. Similar to recent philosophical challenges, applied geography implicitly questions the suitability of the research structure of the controlling paradigm and seeks to address practical questions from a different framework. It is the purpose of this paper to examine some of the implications of this emerging approach. This is accomplished after a brief examination of the evolution of applied geographic thinking.

### THE EVOLUTION OF APPLIED GEOGRAPHIC THINKING

Applied geography advocates have noted that the current emphasis is "a return to a long tradition, not a new departure." (2) While James has documented this long tradition of applied geography, (3) the strong theoretical orientation of the 1960's dwarfed applied academic research. Symptomatic of this was the shift of geographic journals away from applied research toward the theoretical and statistical modeling of the deductive-predictive approach. This positivist persuasion clearly left little space for alternative points of view, and applied work, like other alternative approaches, largely because its methods and philosophy did not match the paradigm, dropped from vogue. Epstein, in reporting the evolution of marketing geography, cites the impact on the discipline's publication outlets.

A much more timely and accessible medium for marketing geography communications has been the journals (outside geography). Again, the 'geographic press' has provided a relative modicum of help in presenting applied marketing geography. Whatever paradigm is in vogue, our piece of the action has not really fit the pattern... one would be hard pressed to find very much in (the geographic journals). (4)

In short, this long tradition, applied geography, was forced to exist on the periphery of the discipline, largely in non-academic or non-geographic print. In addition to the above problem, academic geography became even more teacher oriented, concentrating its service toward this obvious market. This further widened the gap between academic and applied geography because little communication was available. This is particularly surprising in view of the increasing social awareness and demands for social relevance which existed during the 1960's.

Changing attitudes of the 1970's, however, have changed this situation. These attitudes have been expressed largely in terms of challenges to the positivistic model. These include the relevance of geographic inquiry and the role of geographic education. For example, Hurst has suggested "rethink-

ing geography"

In more general terms geographers should be more concerned with material well being, with the human condition, with equity in resource distribution, with responsiveness of various landscape-forming development, and with the harmony of man in his total environment. These kinds of concerns provide a framework within which the analysis of contemporary geographical problems can be undertaken; currently they are not, since they are obscured by the attributes of positivism, particularly the value of neutrality... (5)

King, from a non-radical viewpoint, has also recently stated that we should not allow a purist framework to prevent the addressing of applied questions. (6) Additionally, regarding the issue of relevance, the adequacy of geography curricula has been questioned and Heiges, for example, has identified one of the challenges as expanding educational training to a more practical orientation.

...[to] include some practical experience as part of the program...not [to] be confused with vocational education. Rather...training on-the-job in addition to, but not in lieu of, his academic training. (7)

From this view geographic education must permit the discipline to meet changing market demands which clearly require practicality and relevance.

Employment opportunities further dictate changes in geographic education. This is especially apparent in career opportunities. In planning and curricula changes have been noted in this regard. The Harrison-Larsen survey of geography departments found that departments offering courses in planning have doubled in a five year period. (8) Further, nearly fifty percent will make applied course-work available in the future. This trend, then, also supports the major contention of this paper: applied geography is re-emerging and is evolving due to both philosophical changes within the discipline and the perceived need to meet market needs. This trend has a range of implications some of which are addressed below.

#### APPLIED GEOGRAPHY: FUTURE ACTIONS AND IMPLICATIONS

Among the problems which geography faces in the next decade are communication, accountability and curriculum change.

First, it has become clear that a formal communications channel by which academic and non-academic geographers can effectively exchange ideas and expertise must evolve. While it is clear that attitudes in geography are in the process of change, an adequate outlet for applied research is still needed. The applied geography section of Geographical Review provides a useful but restricted space for such dialogue. Clearly, however, some permanent forum is needed for communication, meeting and exchange and a formal written record. Second, geographers who choose to do applied work must be willing to go beyond simple description and be willing to make specific recommendations for problem resolution. Such prescription will result in accountability judgements both by public and private sources, as well as by other academics. As Jumper has noted, this "going to the well" can be as costly as it is rewarding. (9) Third, geography departments must make decisions regarding the nature of the future curriculum. As indicated above, a number of departments are in the process of making such changes. Departments must be careful not to perceive the applied geography trend as

necessarily resulting in the distinct choice of professional vs. liberal arts education. It would seem beneficial, rather, to carefully select new courses, such as internship practicums, and to modify existing courses to meet necessary changes. A great deal can be accomplished through curriculum adjustment and modification without damaging the liberal arts education. More specifically, a tracking system might be appropriate, whereby the liberal arts curriculum is preserved and a new applied track is instituted.

The few key problems must be dealt with wisely. They are not identified here as opposition to the emerging applied trend, but, rather as key decisions which once made will have long term effects. The identification of their implications is much simpler than providing solutions. If we fail to develop new communication linkages, applied geography will continue to operate on the periphery of the discipline and, thus, will have little additional impact on the core of geography. The apparent trends, however, indicate that applied geography will continue to gain in impetus and will be a major focus of 1980's geography. Accordingly, those of this new persuasion must be willing to provide careful analysis and prescription because they will be judged by peers and non-academic users of their findings. The implications are greater visibility and growth if these efforts are successful and long term damage if our applied efforts are poorly prepared and presented. Finally we must carefully examine our current curricula in terms of our future needs. Successful modification may generate new interest and adequately serve the liberal arts and career-oriented student. A change to a narrow curriculum might fall victim to the fickle nature of the university and result in damage to both enrollments and the discipline's role in the university. These key problems, then, which are inextricably linked to the emergence of an applied geography, need careful consideration by all geographers.

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## STUDENT USE OF STATISTICAL MAPPING UNDER TIME SHARING

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Computer mapping has not diffused through geography departments or through university curricula as rapidly as one might have predicted at the time general mapping algorithms such as SYMAP, GRIDS, CALFORM and others became available. If it is taught at all, map production using computers is still treated as an advanced subject, with the questionable result that upper division or even graduate credit is often given for successful execution of a few simple computer maps. The simple task of preparation of data sets with strict adherence to prescribed formats takes time from consideration of the meaning of the maps and by itself does nothing to enhance the students' skills of geographical analysis. Thus even in university environments, credit in computer cartography typically accrues to mechanical skill rather than intellectual development. Ideally the making of maps should be subordinate to their design and interpretation.

Three factors that retard the desirable shift from mechanical to intellectual aspects of computer cartography are inappropriate computer environments, underdeveloped system software, and (the buck stops here) failure by geographers to make a long-term commitment to development of mapping software and data banks, e.g., digitized base maps. Geography departments have more control over some of these factors than over others. The selection of the computer system must fill the requirements of many disparate users, but the advantages of time sharing for cartography and other computer-assisted instruction (CAI) are manifold. Time sharing allows both immediate feedback and a sense of control which rapidly break down the typical geography student's initial reluctance to use the computer. The computer center should provide at the very least utility programs, with English mnemonics, to copy, concatenate, store and delete programs and data. System statistical programs should include optional output files (e.g., residuals from regression) in a form suitable for use by a mapping program.

Geography departments should be prime movers, not passive users, in the development of mapping software and digitalized base maps. The watchword here should be simplicity, especially at the undergraduate level. The goals of geographers who employ computer cartography as a CAI tool should be (a) to minimize the investment of the student in study of the computer and (b) to maximize the utility of each map that is prepared. To accomplish the latter objective, the geography department can assume responsibility for maintaining base maps, and each person who prepares a base map should contribute it to the growing library of digitized maps. Minimization of the need for computer knowledge requires a continuous effort by the geographer/cartographer to interface mapping algorithms with conversational, file-preparation programs that handle the formatting and sequencing requirements of each algorithm. Finally, the selection of the mapping programs themselves should be made under criteria that favor use by unsophisticated students, even if the versatility of programs must be sacrificed. This policy allows the use of computer mapping in the general curriculum as well as in cartography courses, which dramatically increases the proportion of students who become aware of the opportunity and utility of automated mapping systems.

As an example of this approach to student use of computer mapping, consider the two programs CONMAP (CONversation MAP) and PROMAP (PROfile MAP). CONMAP is a descendant of the scan-line algorithm CMAP(1) that is fully conversational and includes subprograms that prepare base maps and statis-

tical data banks, all without any need to know about FORTRAN formats, the sequence of operations or any other mechanical aspect of the program. PROMAP draws block diagrams using profiles of the CONMAP scan lines. It employs standard CalComp plotter software and a standard hidden line algorithm. (2) Maps can be previewed on a cathode ray device (if available) before plotting. This reduces the number of wasted maps.

To obtain a profile map, the student merely follows the steps shown in figure 1. The data values come from the previously stored file called SOCWE, which was produced conversationally using CONMAP. A demonstration lasting about 20 minutes is sufficient to allow students who have never used the computer to learn to use either program. Sample output from PROMAP appears in Figure 2.

At Colgate, our library of base maps for CONMAP/PROMAP now includes county maps of the 50 states, the U.S., and several other continents and countries. Successive generations of cartography students have gradually built up this collection. Students in other classes can specify the name of a base map to the computer and make maps without any real awareness of the underlying preparation. A hierarchy of readiness is employed to save disk space. Frequently used base maps like the United States or New York state are kept on disk; less frequently used maps are kept on magnetic tape and student assistants can load them onto the system on short notice.

The approach to student use of computer cartography described here has advantages to both student and teacher. Students in introductory courses (including beginning cartography), can have the experience of computer mapping without learning rules of computing. The initial barrier to computing, complexity, is shattered; and if they want to pursue the subject, they can. The teacher benefits by not having to teach computing instead of geography, and the attention of students in cartography and other courses can be redirected to conceptual problems.

Computer cartography as a substantive part of the curriculum is therefore seen as having less to do with the production of maps than with the concept of the map as an informational medium--especially important where there is a single cartography course in a liberal arts curriculum. There is a continual flow from problem-solving work in cartography courses to the user-accessible level of the classroom. Maximum benefit obtains, of course, when teacher and students are both involved in all parts of the computer cartographic experience.

There is also a profession-serving side to this approach. Students increasingly evaluate courses--and disciplines--for the balance they strike between intellectual development and career preparation. The cartography program that is well integrated into the geography and general university curriculum can serve as a prototype for geographic information systems in government and industry, which may broaden the appeal of geography in physical, social and management sciences. Most students who take geography are not geography majors; most geography majors do not emphasize cartography. An effective program of computer cartography, dispersed throughout the curriculum, can help expand awareness among nonspecialists of the utility of geographical perspectives and skills.

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.RUN PROMAP

ENTER NAME OF BASE MAP FILE: USMAP

ENTER WIDTH OF MAP IN INCHES (MAX.=101): 8

ENTER VERTICAL EXAGGERATION FACTOR: .05

ENTER ROTATION OF MAP: 100

ENTER TILT OF MAP: 30

ENTER X-ORIGIN: 2

ENTER Y-ORIGIN: 2

ENTER 1=SHIFT ALL VALUES TO POSITIVE

0=DO NOT SHIFT (NEGATIVE VALUES APPEAR AS HOLES)

YOUR CHOICE: 1

ENTER 0 = VALUES TO BE ENTERED FROM TERMINAL

1 = VALUES TO BE READ FROM CONMAP FILE

2 = VALUES TO BE READ FROM OTHER DISK FILE: 1

ENTER NAME OF DATA FILE; EXTENSION .DAT ASSUMED: SOCWE

THE FILE CONTAINS 1 VARIABLES. ENTER THE  
SEQUENCE NUMBER OF THE VARIABLE YOU WANT TO MAP: 1

DO YOU WANT TO LOG-TRANSFORM YOUR DATA? NO

NUMBER OF SCAN LINES IS 92.

NUMBER OF POINTS PER LINE IS 100.

WORKING...

MAP PLOTTED.

END OF EXECUTION

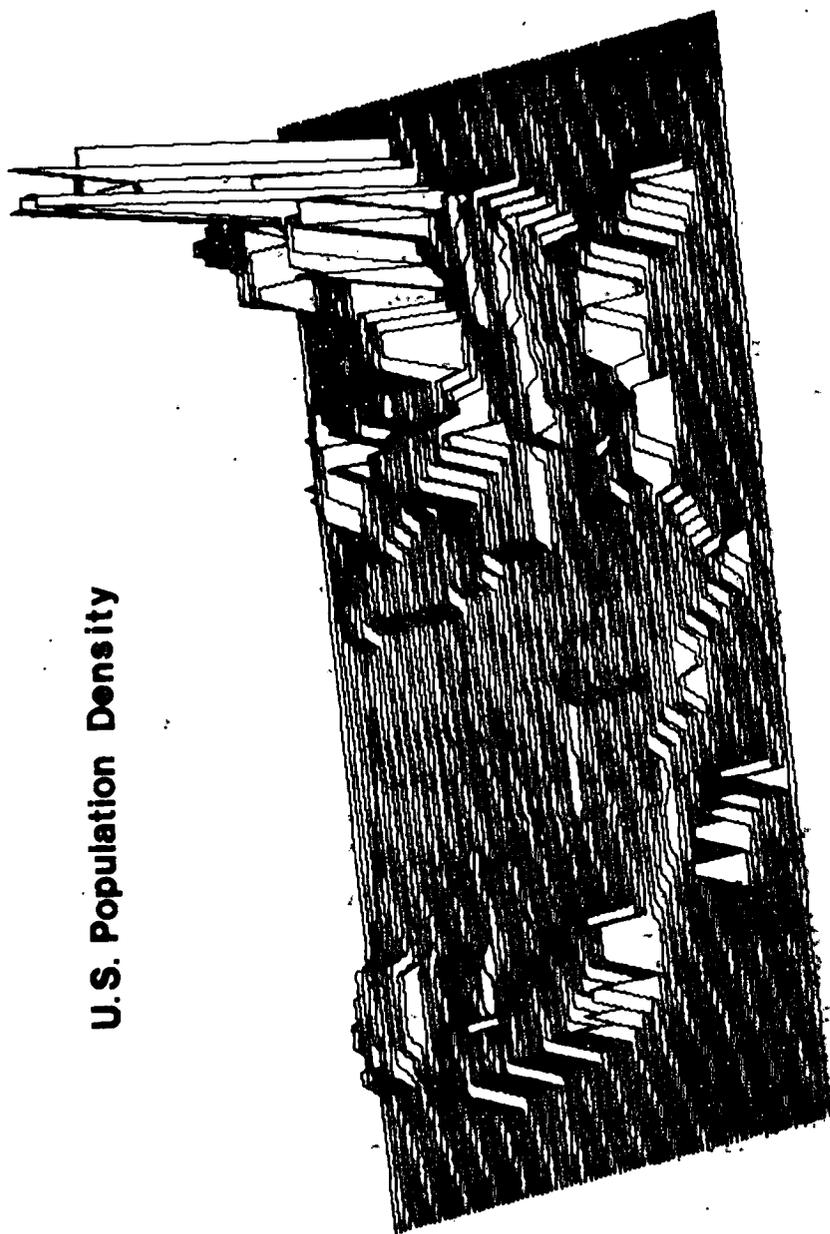
CPU TIME: 1:9.15

ELAPSED TIME: 2:9.00

EXIT

FIGURE 1  
SAMPLE PROMAP SESSION

**U.S. Population Density**



**Figure 2. Sample PROMAP Output**

## A ROLE FOR GEOGRAPHY IN CONTINUING EDUCATION

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A private junior college closes in Pennsylvania and in New York state a community college geographer fights the threat of retrenchment. These events have their carbon copies in other localities across the United States as full-time day student enrollments decline slowly or stabilize in many two and four-year schools. This phenomena, often called "the disappearing student," first became apparent in the Eastern United States when colleges in New York state opened for the Fall Semester of 1971. No one paid much attention. By the Fall of 1972, the force had gathered momentum and diffused into other states. This time a reaction occurred, perhaps a predictable one--the administrators blamed the faculty for "turning off" the students and threatened retrenchment unless somehow the faculty returned the students, while on the other side of the academic fence the faculty blamed the administrators for either not "recruiting" to the degree necessary or for preventing the students from having the rights they had demanded years earlier. Somehow lost in all the verbiage was the inescapable fact that the students were not present and no fixation of blame would change the enrollment statistics.

While the collective paranoia continued, some of the more thoughtful people began to analyze the reasons for the smaller number of full-time day students. Numerous suggestions were made, but two interrelated factors seem to be closer to the crux of the matter than others: smaller high school graduating classes now that the large post-World War II age cohort has passed through the teen years combined with an alleged alienation of young people from traditional higher education. I say "alleged" advisedly; Kramer's comments point toward reality:

Statistics show 15% unemployment rates for humanities and social science graduates, compared to 5% for business graduates. ...25% of all B.A.'s, and 30% of social sciences and humanities graduates, use little or none of their training in their actual work situation. (1)

Alienation could probably be ameliorated. Nothing can be done to change the age structure. In short, it soon became apparent to educators that full-time enrollment would probably never again climb as rapidly as had been characteristic of the 1960's.

The inability to rely almost exclusively upon the numbers of full-time day students as a basis for building a budget forced administrators and faculty to look elsewhere for the desired numbers. One of the segments of education that has thereby been recognized as a focus for development, at least in many two-year colleges, is continuing education. Historically, most schools had saddled this division with the lowest budget priority. In curricular considerations it fared little better--courses were usually the same as those offered during the day although usually taught by part-time instructors. It seems that administrators erroneously assumed that traditional day school educational opportunities would meet the demands of an older and more diverse evening student population. Within the last few years, many institutions have converted from these old modes of thought to new strategies that may help to serve the requirements of this varied clientele.

A question comes to mind at this point: Is this new emphasis on continuing education realistic? Baker and Knerr stated:

...the demand for adult and continuing education has grown at a faster rate than the population in response to such societal trends as more leisure time, women's liberation, changing job requirements, and student's disaffection with the traditional, full-time model of higher education. (2)

Moreover, this growth may accelerate now that the post-World War II age cohorts are in the prime years for additional education even though large numbers already possess a degree. In combination with the earlier quote from Kramer, perhaps Harper's statement partially explains why:

While no solid data are available, some observers have the impression that growing numbers of persons who have bachelor's and advanced degrees are going to community colleges in efforts to improve their job prospects in occupational fields. (3)

I suspect that to this group could be added the high school and college dropout since both would make additional though different demands. It would appear that a complex series of social, demographic and economic factors have created conditions wherein a significant number of individuals could be served by an enlightened approach to continuing education. The necessary ingredient is for faculty members to recognize these potential students and begin to provide pertinent classroom experiences.

The next question becomes what types of opportunities are appropriate. According to Dr. Eugene F. Fram, Professor of Marketing at Rochester Institute of Technology, two approaches may be utilized by institutions of higher education to provide services to the people it seeks to serve. The traditional approach of the past has been labelled the product concept whereby the administrators and faculty determine what courses (the product) should be offered to students (the consumers). If the enrollment materializes, everyone assumes that the correct decisions have been made while the lack of sufficient enrollment means the opposite. Unanswered by this method is the question of what might the students have taken if it had been offered? The new approach, coined the marketing concept, answers this question clearly. In this method, the clientele must be identified and liaison established in order to determine the eventual consumers' precise objectives and requirements. Course offerings are then based on their needs and not on the college's preferences. This system virtually guarantees enrollment and, therefore, little time is wasted preparing courses or programs that will not be well received. Mention should be made that this approach can be applied to all sectors of higher education and not just continuing education. (4)

There are at least two major benefits that could accrue to geography by its participation in the continuing education realm. First, the results might help to alleviate some of the stigma associated with the subject. Large numbers of adult Americans who have not experienced a geography course since junior high school would be exposed to an entirely different type of subject matter than that which prevailed in the public schools two decades ago; this, in itself, would likely be a revelation. I have taught evening students a survey course on numerous occasions, and often they literally marvel at the breadth of geography's reach. In addition, many have commented, sometimes with a twinge of pain, that they can only remember the subject as coloring maps and memorizing capitals. If this is the perception of geography in the minds of Americans, then geographers can strike at the

very heart of these outdated notions by addressing the adults directly. It is fine to teach the "new" geography to full-time students and see the discipline benefit from improved status as this generation matures, yet a more immediate improvement in our image can probably be derived from the judicious proselytizing of the non-college age students.

A second contribution that might emanate from geography's activist role in continuing education is a demonstration of the utility of the discipline in addressing contemporary problems. This approach assumes that a geographer will do more than just provide an overview of geography's scope, as would be the focus of the first contribution. In this second case, a course would be structured to provide insight to the various methodologies that geographers employ in their work and that are also useful in the everyday world. In an evening class students were asked to map the land use of an area and then focus on the past, present, and future landscape assemblages, given various socio-economic and political scenarios. Such a simple exercise can easily be parlayed into an exciting evening of outright debate which focuses upon the spatial implications of societal activities. During the discussion a student will usually ask the key question: Why doesn't this type of analysis occur in more decision-making arenas? This query provides the opportune moment to have students realize that while geographers can perform these tasks, more informed citizens can also begin to ask pertinent questions of the various agencies and commissions that affect their lives. Hence, this type of activity yields the double reward of displaying geography's analytical tools and helping the students to understand better the complexity of current issues.

At this juncture, the reader may wonder how to get the "foot in the door" because if geography's image is as bad as most geographers believe, then the application of the marketing concept may yield a lack of desire for geography. This problem may be resolved by close association with the personnel taking the pulse of the community. Communication flow should be in two directions: 1) the geographer should develop some feel for the community needs and respond to them; 2) the geographer should provide the community with information about geography.

Initially, a geographer may have to create a market through the use of the two types of courses commonly associated with a continuing education program. One group consists of the already existing credit courses. Probably a fair number of geography courses taught at the introductory level could be presented in modified form and become popular adult education offerings. Examples of changes that could be made include the use of exercises of the variety mentioned above and more emphasis on local and regional characteristics. Conversely, some courses may need no revision whatsoever, but nothing in the marketing concept prevents an instructor from making the package as enticing as possible or from using currently available courses, assuming a demand can be demonstrated.

The other type of continuing education course may be unfamiliar to a few geographers--the variable credit or non-credit variety that may last a complete semester or only a few weeks. These non-traditional offerings cause all sorts of problems such as forcing creativity in designing a useful product and distorting a teaching load, to name only two. Problem one should not require a debate; either you are or are not interested in doing this type of work. The second poses more serious practical difficulties. For example, teaching load issues rise to the surface almost immediately: "How many students are necessary to offer the course?" "Do I have to teach this course outside my regular hours?" Colleges will need to re-examine past policies and procedures because the provision of different types of courses may require non-traditional guidelines. Inflexibility on the part

of the administration in adhering to a magic class size number may be unrealistic the first time such a course is given. On the other hand, faculty may have to be flexible about the pay schedule. If the administration is willing to allow an innovative class with few students then perhaps the instructor should be willing to accept less than the usual fee, although this arrangement should be by mutual agreement. Perhaps a sliding scale would even prove to be better and add an incentive factor.

There would seem to be an ample amount of leeway for compromise on all these issues if faculty members and administrators are both sincerely interested in meeting the wide range of interests of the growing continuing education sector. If the administration views this area only as a money-making proposition and the faculty view it only as a way of preventing retrenchment, then both are being less than fair. Collectively, colleges must recognize that an ever larger number of students may fit the part-time mode, more so than the full-time one. To treat this population as second-class citizens will be to short-change a vital segment of the American population. Geographers could benefit from involvement in continuing education by using the opportunity to present the discipline's recent intellectual advancements and, thereby, furthering the cause of improving geography's public image.

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## WIDOWHOOD, MARRIAGE MIGRATION AND MARRIAGE PARTNER PREFERENCES IN COLONIAL TLAZAZALCA (MICHOACAN, MEXICO): 1750-1800

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Spatial mobility in colonial Spanish America has been largely neglected by historical geographers. Kubler, (1) Mellafe, (2) and Cook (3) have demonstrated the types of research that might be done. The potential significance of this aspect of historical population study has been pointed out by several scholars, including Morin (4) and Moreno Toscano. (5)

By contrast, the literature on race mixture in Spanish America is abundant, as indicated by Mörner's introduction to and overview of the topic. (6) However, little is known of the geographical distributions of racial groups, and even less of spatial patterns of racial mixture rates. The present case study deals with these two related topics and uses data on widowed individuals from the parish archives of Tlazazalca in the colonial bishopric of Michoacan, west of Mexico City. These data were also employed elsewhere for a more general study of marriage patterns in Tlazazalca. (7)

### THE DATA

The information upon which this paper is based, was found in the marriage registers (Libros de Matrimonios) of the parish archive of Tlazazalca. For the fifty-year period, 1750-1800, each marriage was coded according to the year, month and day of the ceremony; the place of marriage; the stated racial category of each spouse; their previous marital status; and their respective places of residence and birth. The dependability of colonial records has been evaluated by numerous authors, perhaps most extensively by Cook and Borah, who determined that colonial records at the parish level were generally accurate and thorough. (8) Complete accuracy, of course, is not to be expected because, for example, common law marriage was practiced, most commonly by the lower social classes. (9)

There are three advantages to examining widows' preferences. First, since remarriages are related to the frequency of widowhood, a determination of the rate of remarriage in an area might enhance the study of sex differentials in mortality.

Second, remarriage reflects colonial social customs, such as the degree of marriages between widowed persons and single individuals. Sex differentials in remarriage rates might also shed light on sexual social bias.

Finally, and perhaps most importantly, this line of inquiry might determine whether remarriage was a significant indicator of racial preferences, and a means by which the lower social groups improved their social status.

### MARRIAGE PATTERNS.

In Tlazazalca, 11.1 percent of all males marrying and 4.7 percent of females marrying had been widowed prior to marriage. Table 1 shows the numbers of widows, by sex, for the four major racial groups that were listed in the parish registers. The remaining racial groups had too few individuals

to be significant. In each of the four principal groups, males remarried at a higher rate than females: for Spaniards and Mestizos, in fact, the rates were greater than 2.5 to 1. For widowed and non-widowed partners combined, however, Spanish brides outnumbered Spanish men marrying in Tlazazalca (Table 2). While Mestizo men outnumbered the women of their own group by only 16 (to produce a male/female ratio of 1.04), among widowed partners the same ratio was 2.77, with men outnumbering women by 23. Among the Mulattoes and Indians, the differences, although significantly different, were not as marked (Table 2).

TABLE 1  
RACIAL COMPOSITION OF WIDOWED RACIAL PARTNERS

|         | MALE | FEMALE | TOTAL |
|---------|------|--------|-------|
| Spanish | 184  | 69     | 253   |
| Mestizo | 36   | 13     | 49    |
| Mulatto | 21   | 13     | 49    |
| Indian  | 68   | 36     | 104   |
| TOTAL   | 309  | 131    | 440   |

TABLE 2  
MALE/FEMALE RATIO

| RACE    | TOTAL POPULATION | WIDOWED |
|---------|------------------|---------|
| Spanish | 0.94             | 2.67    |
| Mestizo | 1.04             | 2.77    |
| Mulatto | 1.07             | 1.62    |
| Indian  | 1.26             | 1.89    |

Remarrying commonly was more accepted in Spanish society for men than for women. (10) In fact, in Tlazazalca, 81.2 percent of widowers married single women, whereas only 55.6 percent of widows married single men. (11) These values are much higher than those found by Morin in Zacatelco, Mexico, where about 50 percent of the widowers married single women, and about 25 percent of the widows married single men. (12) Although the differences between male and female rates are similar in both Tlazazalca and Zacatelco, the lower percentages may have resulted from the situation of the latter parish in a more densely populated region east of Mexico City, where the single individual's choice of a mate was in all probability much better than in Tlazazalca. Another reason, however, might have been a higher death rate in Tlazazalca than in Zacatelco. The effects of various diseases, such as smallpox, has been noted by various authors.

In most cases, racially endogamous preferences prevailed. Ninety-three Spanish males, for example, whether marrying unmarried or widowed women, chose Spanish women. Two-thirds of the Indians also married within their group, but Mulattoes only chose Mulattoes at a rate of 22 percent. The mixed-blood groups showed a greater exogamous tendency than the Indians: both mixed groups preferred Spanish women to their own, Mestizos at a much larger percentage than Mulattoes (65 to 38 percent). For these two racial groups, marriage could mean a significant step up the social ladder. The desire to elevate one's social status through marriage appears to have outweighed the stigma attached to widows in Spanish society. The Indian who was hopelessly located at the bottom of the social scale, (14) was able to marry out of his group; and he did do mostly to Mulatto women (22 percent). Spanish widows, although preferring their own racial group, married at a lower percentage than their male counterparts (76.9 percent). These widows married Mestizos at a rate of 11.6 percent and Indians at a rate of 10.1 percent. Not one case was found in which a Spanish widower married an Indian woman, and a mere 5.4 percent of the Spanish men married Mestizos. Indian women were the most endogamous group, preferring racially similar partners at a rate of 86.1 percent, almost 20 percentage points higher than their male counterparts. Again, female mixed-bloods were the least endogamous group in their partner preferences: 58.3 percent of Mestizas and 53.9 percent of the Mulattas remained racially endogamous. Mulatto women, conversely, married Indian males at a rate of 46 percent. Despite these racial differences in rate of intermarriage, the strength of endogamous marriages produced a relatively high Gamma Coefficient of 0.745 for the crosstabulation of male and female racial preferences.

#### DISTANCE

Marriage migration was an important geographic process in colonial Mexico. Table 3 indicates the mean distances traveled by widows and widowers of each racial group, to marry in Tlazazalca. Excluding Mulatto men, Spanish males and females traveled the shortest distances in order to marry. Apparently, Spaniards preferred to settle near rather than within the parish center. Approximately 6.8 percent of these Spanish widowers declared Tlazazalca their place of residence. On the other hand, 71.5 percent of the Indians who remarried lived in the parish center. These results suggest that Tlazazalca was an Indian parish during the seventeenth century. (16) Purepero, 5.5 miles southeast of Tlazazalca, was the origin of most of the Spaniards, and, therefore, must have been strongly Spanish in population composition because few Indians or Mulattoes came from there. Approximately 20 percent of Mestizos came from Purepero to Tlazazalca to marry, the largest percentage from any area of origin. A large percentage of Mulattoes lived in Tlazazalca (42 percent).

TABLE 3  
MEAN DISTANCE TRAVELED BY WIDOWS IN MILES  
PER RACIAL GROUP (NON-TLAZAZALCA RESIDENTS ONLY)

|         | Males | Standard<br>Deviation | Females | Standard<br>Deviation | Distance<br>Ratio |
|---------|-------|-----------------------|---------|-----------------------|-------------------|
| Spanish | 9.27  | 7.27                  | 8.22    | 3.73                  | 1.13              |
| Mestizo | 12.20 | 6.76                  | 18.06   | 20.03                 | 0.67              |
| Mulatto | 8.19  | 4.94                  | 11.69   | 5.47                  | 0.70              |
| Indian  | 14.11 | 11.54                 | 10.88   | 3.51                  | 1.30              |

It is not surprising that the mean distances for the Indians migrating to Tlazazalca are higher than those distances of the Spaniards. Fewer Indians migrated, and those who did had to come from settlements farther than the immediate vicinity of Tlazazalca. The distances displayed by the total population were similar to those of remarried widows, except for the Indian women who migrated almost five miles less than the mean distance. This shorter distance for Indian widows might stem from the male/female ratio of 1.89 (Table 2): the ready availability of widowers or bachelors to the Indian widows would not have required the Indian widow to search very far from her home. Her male counterpart's migration field was appreciably larger if he preferred a racially endogamous marriage, the Indian widower in search of a female of his own race generally had to travel farther than an Indian widow, because of the larger ratio of Indian males to females.

Among Mestiza widows, the desire to remain endogamous might have caused the relatively high mean distance. Mestizos preferred Spanish women to the Mestizas, thereby making the search for a suitable spouse of her own racial group more difficult. Among Mulattoes, the male had little need to travel, since he could usually find a Spanish bride, whereas Mulatto women who were not able to marry their own, married Indians.

#### CONCLUSIONS

The marriage partner preferences and mean distances migrated to find a suitable spouse in colonial Tlazazalca, suggest that the special sub-population of widowed individuals preferred to marry racially endogamously. The mixed-bloods, in most cases, preferred to marry socially upwards, to improve their own standing in the rather closed society of colonial Tlazazalca. Proximity also played an important role in migration into the parish center. Although Spaniards did not make up the majority of the Tlazazalca residents, their mean migration distance was lower than those of the other groups. Indians migrating constituted a small percentage of all Indians marrying in the parish center. Among the mixed-bloods, reversed patterns emerged, however. More Mulattoes than Mestizos lived in Tlazazalca, but their mean migration distances were lower. The causes may not be clear, but partner preferences might be responsible for the reversed results.

These results are tentative. Further disaggregation and analysis of the data is necessary to explain more fully the patterns found here. (17) The exact nature and significance of widowhood can only be hinted at here. However, given the Spanish moral attitude to marriage, and the relatively high mortality rates of the period, it is clear that widowhood and remarriage was a common experience. Furthermore, an examination of variations through time should be illuminating. For example, an increase in the rate of remarriages could perhaps let us monitor the period when diseases hit the area creating the necessity for widows to search out new spouses. These and other topics are being considered as part of an on-going study of marriage migration in colonial Michoacan.

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## Abstracts

### ETHNIC CONSIDERATIONS IN URBAN ECOLOGICAL FORM: THE EXAMPLE OF HISPANIC-AMERICANS IN THE METROPOLITAN SOUTHWEST

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The significance of the Hispanic-American population, whose presence so dominates the fabric of contemporary urban life in the Southwestern U.S., is explored utilizing a traditional factorial ecology of two selected cities. The persistence of an Anglo-Hispano spatial and economic bipolarity is regarded as a viable conceptual foundation upon which the unique ecological configuration of the American Southwestern metropolis can be based.

### THE EFFECT OF LARGE-SCALE HOUSING DEVELOPMENTS ON ABANDONMENT: THE CASE OF STARRETT CITY

Ralph L. Urrico and Michael P. Marchioni  
*Rutgers University and East Tennessee State University*

For over two decades, the City of New York has witnessed the out-migration of much of its middle-class population, towards the perceived security and tranquility of suburbia. Large, middle-income housing projects have been introduced recently, as a means of trying to keep the middle-class within the city. These developments have had profound effects on neighborhood housing and migration patterns. One such development is the Starrett City housing facility in Brooklyn. Investigation of approved application data and resident questionnaires indicate that Starrett City has attracted a high percentage of its applicants from the three adjacent transitional neighborhoods of East New York, Flatbush, and East Flatbush. Widespread abandonment and deterioration have become more prevalent since the opening of Starrett City in early 1975, particularly in East New York. Greater racial change and segregation have taken place in those areas of Brooklyn, which the City itself was trying to save and maintain.

### MINING AND MIGRATION

Rolf Sternberg  
*Montclair State College*

Mining and migration explores the interaction between these two

processes to identify consequences in terms of a working population's composition. Talent, individual mobility, migrant's age, employment period, and source area of migrant are some of the key variables to be considered in this analysis. These characteristics are indicative of a population that is patterned initially for a specific purpose. Such an example may be instructive in evaluating the development process in an empty area and serve as a benchmark against which to record subsequent changes.

"Mining and migration" analyzes the migration patterns of a limited number of persons in a mining operation in Amapa, Brazil. The process of change leaves its imprint upon the landscape as well as upon social institutions. The thrust of this analysis emphasizes the population composition and its migration field in the ICOMI manganese mining operations as of mid-1976. By limiting the study in space and time, it may be possible to identify population characteristics that are part of the development process in model format.

Resource utilization, "development," is not a particularly original idea. What is needed is a better demographic overview of who is involved in this kind of process at what level. The ICOMI method of demographic accounting allows a systematic analysis of its labor force and its dependents. Within ICOMI it serves as labor inventory and to plan for local housing, health care, education, and social service needs; for these data are useful to elaborate a demographic development model.

The need for a demographic development model is particularly important in the Latin American context because large areas remain to become part of the national economies. The ICOMI experience, with slight modifications, may serve other development schemes as model in the quest for economic integration. In the case of Brazil, the changes had their theater of action. Organization in other areas of Brazil and in Latin America on the threshold of comparable changes could study the ICOMI practices and experiences to achieve projected changes more effectively.

## SOCIAL AND SPATIAL DIMENSIONS OF ABORTION IN A CLEVELAND, OHIO SAMPLE

Noah F. Henry

*State University of New York at Binghamton*

Spatial dimensions of abortion information dissemination and socio-demographic characteristics of a Cleveland, Ohio aborting population are examined here. This study reveals a youthful, unmarried, moderate income, largely uneducated, Protestant population, similar to other abortion studies. It further indicates great disparities in flows of abortion-related information.

Concerning the abortion decision confidantes included the sex partner, mothers, and friends. Clergymen, physicians, friends, libraries, and personal experience served as technique-oriented information sources. Abortion was desired because of marital, financial or educational status; other options were deemed inadequate solution. Interpersonal communication influenced abortion facility selection. Distance and time traveled were short.

## WHERE WE ARE FROM OR AN OVERVIEW OF THE ORIGIN OF PH. D'S IN GEOGRAPHY

Jerry D. Gerlach  
*William Paterson College*

Studies of the origin of Ph.D.'s in geography are relatively uncommon. The purpose of the paper is to examine the recent origin of Ph.D.'s or professional geographers. The data source for the study was The Professional Geographer from 1972-1977. Most Ph.D.'s in geography came from two areas, the Great Lakes states and the Far West. The areas that produced the fewest Ph.D.'s were the Mid-east and the Southeast. The major Ph.D. granting schools were in the Midwest, the Far West, the Mid-east, and New England. Additionally, there have been changes in the rankings of the major schools as school production rises and falls. The Ph.D. granting schools are now more widely distributed than they were in the 1960's. Finally, the actual number of Ph.D.'s granted in geography has declined since the peak year of 1974. This study indicates that geography in the U.S. will continue to have a Midwestern and Far Western flavor to it.

## WALKING TOURS AND STREETMARKER SYSTEMS: A DEMONSTRATION PROJECT IN NEIGHBORHOOD GEOGRAPHY AND COMMUNITY EDUCATION

John C. Muir  
*High Rock Conservation Center, Staten Island*

A general problem of the geographic profession has been a lack of success in popularizing its findings and communicating those findings to general audiences. A project in community education carried out in the Park Slope district of Brooklyn demonstrates methods to popularize and communicate a study in historical geography on the neighborhood scale.

The district, developed as an elite row house suburb in the late 19th century, was perceived as a living museum--or museum without walls--and three educational modes characteristic of museum programs were utilized: self-guided walking tours, an illustrated guidebook, and a system of 200 informational streetmarkers. Topics addressed included sequence occupancy and landscape evolution, past environmental perceptions, and evolving social geography, and the ecology of remnant natural elements. The target audience for the project was exceeded, numbering 2000 local school children and their teachers, and 2000 local adults.

## WINE AND THE WORLD: A STIMULUS TO GEOGRAPHIC UNDERSTANDING

Edmund B. Woods  
*State University College, Brockport*

This paper reports on a different method to teach geographic prin-

cipals. The principles of location, spatial variation, and areal relationships are introduced in a manner that is somewhat less than explicit. The central focus of the class is the subject of wine (enology and viticulture). The strategy is to stress the many ways in which wine may be directly associated with the physical variables of the environment. Geographic principles are pointed out as important relationships needed for understanding rather than as principles which all geographers recognize. This method lets the student have a feeling of discovery not always associated with the more traditional methods. The mystery of wine is believed to set up a desire on the part of the student to seek out explanations. Exploitation of that motivation is the method used here.

## THE JAPANESE GOLF BOOM

Charles A. Heatwole  
*City University of New York, Hunter College*

In Japan a growing environmental controversy centers upon a rather novel competitor for that nation's scarce rural land: the golf course. Although golf has been played in Japan since 1903 it has only become a major pastime within the last decade. Between 1965 and 1976 the number of golf courses grew from 356 to 1246. This growth has led to conflict with municipal and agricultural interests. The tendency for golf courses to cluster on the periphery of urban areas has led to a decline in land available for new housing and caused concern for the future availability of well water. The impact on agriculture has been manifested in the conversion of rice-producing acreage to the production of turf, and the wholesale transfer of land from farm to fairway. The total impact has been so severe that 35 of Japan's 46 prefectures have now enacted anti-golf land laws. However, golf's popularity continues to grow, and the disproportionate political and economic clout of its enthusiasts makes the longevity and effectiveness of current and future anti-golf legislation quite tentative.

## SNOWMOBILE ACTIVITY: HISTORICAL TRENDS AND SPATIAL DISTRIBUTIONS

Malcolm Fairweather  
*State University College, Plattsburgh*

The snowmobile industry boomed during the 1960's but the present decade ushered in lean times. Predominantly a leisure oriented activity, snowmobiling is largely restricted to the northern regions of the U.S. with distinct concentrations in the northeastern and north central states where the combination of population density, high snowfall and long winters form the essential ingredients of this spatial patterning.

## Special Sessions

### THE WATER RESOURCES OF LONG ISLAND: A CLASSIC CASE OF GEOGRAPHIC LIMITS

CHAIRPERSON: Leonard Zobler  
*Columbia University, Barnard College*

#### SUMMARY

As an essential non-substitutable good available in limited amounts in urban areas, water is managed as a monopolistic social utility to insure its equitable public distribution. The aim of government policy had been to provide a water supply that does not constrain development. While water is a basic resource input in all areas, in some places, as in Long Island, its supply is especially crucial because of peculiar relations among its uses and the natural and designed hydrologic systems.

On Long Island, in addition to its usual potable, manufactural, and waste disposal functions, water also sustains a major part of the regional economy dependent on fisheries and water-based recreation. Because of the peculiarities of the local hydrologic cycle, especially the role of ground water, the various uses of water conflict with one another in ways that impair the integrity of the water cycle. The continued economic growth of Long Island thus is threatened by self-induced water limits, unless ways can be found to mitigate the counter-productive effects of the adversary claimants.

The various papers presented in this session will describe the behavior of the natural and disturbed hydrologic cycles, the social and technologic factors responsible for disturbance, the present and predicted impact levels, and possible avoidance measures.

#### THE HYDROLOGY OF LONG ISLAND

Leonard Zobler  
*Columbia University, Barnard College*

The outstanding hydrologic feature of Long Island is a vast, under ground water reservoir, estimated to contain upwards of 60 trillion gallons

of water, with a specific yield of ten percent. The boundaries of the reservoir are the water table, surface lakes and streams, the underlying consolidated bedrock surface, and the fresh groundwater-salty groundwater interface. Only the bedrock boundary is fixed; the others depend on the hydraulic balance between inflow and outflow. Of particular interest are the falling water tables and the onshore movement of the fresh-salt water interface, or the intrusion of salty groundwater.

The groundwater reservoir has six major vertically stratified hydrogeologic units, whose extent, thickness, depth, altitude and hydraulic properties affect storage, movement, and discharge. Depth to the underlying bedrock ranges from about 100 feet along the northshore to 2000 feet along the southshore. The aquifers are recharged by infiltration through the overlying occupied surface, dip toward the southeast, and, depending on their position in the column, contain unconfined and confined water tables.

Prior to 1900 the hydrologic system was in dynamic equilibrium with inflows balancing outflows along pathways whose total annual flux approximated 45 inches of precipitation per year. The expanding water demands of urbanization and accompanying land use changes have altered the pathways of water and driven the system to a transient state, in addition to altering the quality of the reservoir and offshore water. Their general hydrologic impacts are described.

## WATER SUPPLY MANAGEMENT IN NASSAU COUNTY

Russell A. White

*City University of New York, Hunter College*

Over the past three decades, Nassau County has experienced the most rapid population growth of the twelve county core and inner ring segments of the New York Metropolitan Region. The fourteen million people of this urban agglomeration have seldom been plagued by significant problems of potable water supply. The predominant feeling is that

"Nature favors the New York Metropolitan Region with substantial reserves, and while innovations such as cooling towers and desalinization equipment may augment them further, the available water supply within the area, or any of its parts, is more a function of the existing governmental machinery. Political negotiations interpose themselves between the apparently straightforward tasks of locating and building reservoirs, constructing terminals and aqueducts, and completing distribution facilities."

This simplistic approach to water supply in Megalopolis rather than being uniquely found in Professor Wood's otherwise highly respected work, is typical. This prevailing erroneous belief has deterred rational development especially in the areas dependent upon ground water.

Ten percent of the Region's population live in Nassau County. These people are completely dependent upon ground water for all of their fresh water needs. There is no Region-wide operational plan to rationally integrate and manage surface and sub-surface waters. There is now sufficient data for at least a significant sub-regional plan to be formulated and

implemented.

A rational program may simplistically be divided into cultural and physical approaches. A successful program will employ both. Historically, in the United States, we look to technology rather than social action to solve our conservation problems. Adequate water can be provided for the residents and industries of Nassau County through purely physical approaches. Such solutions will be higher cost if not coupled with social acceptance of rational use. There are at least six potential alternatives to mining the ground water reservoir. The most likely solution is the renovation and recycling through recharge basins of waste water. Another likely solution for the near future is to import water from Suffolk County. In the more distant future, water might be imported from the surface water reservoirs of the New York City System. Another possible solution that is technologically, if not quite yet economically feasible, is desalinization of saline waters. A fifth solution would require major technological breakthroughs in weather modification. A final solution is also not yet technologically feasible; the conversion of Long Island Sound into a vast fresh water reservoir.

Before meaningful regional water planning can proceed or succeed the many agencies at various levels of government within the county must learn to work together or be organized into one county-wide water board. Hopefully, the suggested Nassau Plan could serve as a model for other suburban areas dependent upon a ground water resource.

## URBAN LAND USE AND HYDROLOGIC DISTURBANCE

Paul E. King  
*Columbia University*

Long Island is used as a case study to illustrate the intricate relationships between urbanization, water use and disturbance of the recharge process. Urbanization is defined as the increase in population in non-agrarian activities and its concomitant spread of the built environment. The historical development of the area is reviewed paying attention to the increase in population and economic activity and changes in water consumption. The pattern of development clearly reveals the importance of access to New York City. Distance from the city is a significant factor in explaining the time and intensity of growth. Superimposed on this band structure are a number of local growth areas centered on pre-existing small villages. The paper assesses the significance of the 1970 Development Plan implemented by the Nassau and Suffolk Regional Planning Board in terms of its impact on the form and speed of future urbanization. A conceptual model is provided which relates growth in general to changes in both population and political organization. These affect the demand for water and the use of the resource in different ways. In addition to disturbing the process of recharge through increased ground cover and channelization in catchment areas it is noted that urbanization could also bring expertise and a managerial ethic which may hold the seeds of more pragmatic and efficient use of the water resource.

## THE IMPACT OF WASTE WATER ON LONG ISLAND

Gerald Palevsky  
*City University of New York, City College*

Yesterday's sewage is tomorrow's drinking water! This is particularly true for Long Island.

Under ideal "natural" conditions, precipitation balanced the evapo-transpiration to the atmosphere and the outflow from the subsurface reservoir to the surrounding salt water area.

As population densities and standards of living increased, more water was mined from the ground water reservoir. Wide spread construction and urbanization led to surface water runoff diversion to the salt water areas. Septic tank effluents, storm water recharge basins, sanitary landfill leachate and industrial discharges became significant sources of ground water replenishment. The path from sewage to water supply was becoming very short indeed.

The use of sanitary sewers to collect and convey wastes to centralized points of treatment, rather than direct discharge to the ground, has improved ground water quality. At the same time this action increased ground water withdrawal, lowered the ground water reservoir, and allowed salt water intrusion in many areas. The point discharge of the treated waste water effluents to surrounding salt water areas and the ocean dumping of the separated solids have produced other problems. Recreational boating wastes, oil discharges, dredge spoil dumping, thermal pollution and sewage sludge disposal by both Long Island communities and adjacent political subdivisions affect the recreational uses of the waters around Long Island.

Newer technologies, more intensive treatment and greater care and control in the handling and disposal of solid wastes and sludge residues are changing the dreary picture. The use of reclaimed waste water to augment and safely replenish the ground water reservoir is now being actively undertaken. Studies on acceptable, nuisance free treatment and utilization of solid waste and sewage sludges are also under way. The practice of conservation, recycle and reclamation is more than just a vision on Long Island--it is a necessity which is coming to fruition.

## MARINE RECREATION ON LONG ISLAND - PROBLEMS AND PROSPECTS

Niels West  
*University of Rhode Island*

Marine based recreation on Long Island is unique in several ways. The northern coastline faces one of the largest inland seas within conterminous United States while the southern represent the northeastern leg of the New York Bight and the Atlantic Ocean.

While the geomorphological characteristics of Long Island tend to increase the number of different types of recreational opportunities, the

island's physiography has also resulted in a certain degree of spatial separation of these activities. The increased marine related opportunities available on Long Island, the heterogeneous population on the island as well as in the neighboring New York Metropolitan area, has resulted in emerging user conflicts which are likely to intensify with time. These conflicts can be divided into the following major classes: (1) between recreational and nonrecreational usages (2) within competing marine recreational activities and (3) among users engaging in the same recreational activity. These conflicts are likely to intensify, first because of projected increases in leisure time and disposable income by a majority of the population and secondly because of private ownership of land facing the shoreline, and the inability to provide public access to the beaches. The paper assesses present and future supply and demand in shorebased outdoor recreational activities and facilities on Long Island in light of the Coastal Zone Management Act of 1972 and the New York Statewide Comprehensive Outdoor Recreational Plan.

### LONG ISLAND'S FISHERY RESOURCES:

#### SOME PROBLEMS IN THE UTILIZATION OF DEPLETING RENEWABLE RESOURCES

Paul I. Mandell  
*Columbia University, Barnard College*

In the Long Island Sound and adjacent waters expanded fishery utilization and the environmental consequences of urban-industrial growth come into direct conflict. Now and in the past the carrying capacity of the area's fisheries has suffered severe depletion from chemical and biological contaminants, interventions in the hydrologic regime and large-scale modifications of bathymetric and topographic features resulting from the steady expansion of residential and industrial activities. This paper considers the extent of the losses that environmental spillovers have imposed upon Long Island's fisheries in the past, the present threat that they pose and certain problems peculiar to the management of depleting, renewable resources.

We begin by reviewing the extent to which in the past Long Island's fisheries have suffered development-induced depletion. Next follows a review of the status of presently exploited fisheries. Its emphasis is upon current assessments of existing environmental threats to their productivity. Finally, we develop a dynamic, Schaefer-type model of the utilization of a fishery suffering depletion due to environmental spillovers and apply this model to the Long Island Sound oyster fishery.

### A REGIONAL ANALOG HYDROLOGIC MODEL OF LONG ISLAND

Grant Kimmel  
*U.S. Geological Survey*

The effect of planned sewerage and recharge with reclaimed waste water on the ground-water reservoir on Long Island was evaluated using a

three-dimensional electric analog model. Population changes, the extent of proposed sewer construction programs, and the volume of expected sewer outfall were used as a basis for stressing the system for a 20-year period starting in 1975. Water-table declines of up to 5 metres in east-central Nassau County and 1.8 metres in central Suffolk County were predicted. Simulated recharge with the expected volume of sewerage was treated in several different patterns starting in 1955. Considerable overrecovery was predicted in the middle of the island, but only partial recovery of the water table was predicted in nearshore areas along the south part of Long Island. Predicted streamflow was below the 1975 average in south-shore streams by 2015, the end of the modeled period.

## PRESERVING PRIME FARMLAND: THE SUFFOLK COUNTY PROGRAM

David Newton

*Suffolk County Cooperative Program*

Faced with the steady conversion of prime farmlands to non-agricultural, primarily residential, uses over the past three decades, Suffolk County officials have instituted a unique farmland preservation program involving the voluntary purchase of development rights. The goal of this program is to save at least 12,000 acres of prime farmland.

Suffolk is New York State's leading agricultural county. Major crops include potatoes, sod, vegetables, nursery stock, flowers, and ducks. Over half the land is owned by non-farmers. The market value of farmland ranges upward from \$3,500 per acre.

The County's program, developed by a 14-member Agricultural Advisory Committee, is based on Section 247 of New York's General Municipal Law and has been authorized by the County Legislature under Local Law No. 19 of 1974. The County has earmarked \$60 million in the capital program to purchase development rights over the next four years.

The County solicits offers from farmland owners. These bids are evaluated and lands not meeting certain criteria are rejected. Appraisals are made to determine the value of development rights. If the county and owners agree on price, contracts are signed.

The purchases are financed by 30-year municipal bonds, the sale of which must be approved by the County Legislature.

The initial purchases in the program encompassing 3,800 acres, were scheduled to take place during the summer 1977.

The program, the first of its type in the nation, has been plagued with political, financial, and administrative difficulties. However, its benefits environmentally, economically and socially are expected to be substantial.

## FUTURE EXOGENOUS SOURCES OF WATER FOR NASSAU AND SUFFOLK COUNTY, LONG ISLAND

Robert M. Hordon  
*Rutgers, The State University*

In terms of water supply planning, Nassau and Suffolk County in Long Island constitute one sub-region of the New York Metropolitan Region. The two counties are entirely dependent on local ground water as a source of supply for the population of over 2.5 million. Consumption of over 255 million gallons per day is approaching the so-called "permissive yield" of the aquifers, especially in the more densely populated Nassau County. Indeed, water supply need projections by the Temporary State Commission of New York State indicate a substantial deficit by the year 2020. This need for additional water may be accelerated in time by continued water quality deterioration as evidenced by increasing nitrate levels (attributed to septic systems and lawn fertilizers) and salinary intrusion. Consequently, consideration is being given to a variety of projects which can supplement or replace existing local supplies. Briefly, alternative sources include: 1) importing water from the Hudson River via an expanded New York City system; 2) converting Long Island Sound into a fresh water reservoir; and 3) desalination. As of now, the most reasonable alternative appears to be the purchase of surface water from New York State in conjunction with a proposed ground water exchange program with New York City during certain seasons.

The contribution of each of these exogenous alternatives will be systematically evaluated with regard to its technologic, economic, and political feasibilities as a potential solution to Long Island's predicted water deficiencies.

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## ISSUES IN GEOGRAPHIC EDUCATION

ORGANIZER AND CHAIRPERSON: Arlene Rengert  
*West Chester State College*

### SUMMARY

This special session included the following papers: "Where Are We From or an Overview of the Origin of Ph.D.'s in Geography," by Jerry D. Gerlach, (1) William Peterson College; "Implementing Program Change: Some Implications for a Geography Department," by Charles W. Grassel, West Chester State College; "Academic Geography Outside the Classroom: Interns and Community Service," by F. Robert Bielski, West Chester State College; "Geography's Role in Continuing Education," by Robert Ziegenfus, (2) Rutgers, the State University; "Defining the Issues in Geographic Education," by Janice J. Monk, University of Illinois; "Student Use of Statistical Mapping Under Time Sharing," by A. Rees Clark, (2) Colgate University; "Walking Tours and Street Market Systems: A Demonstration Project in Neighborhood Geography and Community Education," by John C. Muir, (1) High Rock Park Conservation

Center, Staten Island; "Wine and the World: A Stimulus to Geographic Understanding," by Edmund B. Woods, (1) State University College, Brockport.

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## APPLIED GEOGRAPHY: SOME EXAMPLES AND IMPLICATIONS

ORGANIZER AND CHAIRPERSON: Martha L. Corry  
*State University College, Oneonta*

### SUMMARY

This special panel session included the following papers: "Decentralizing Police Services: A Feasibility Study of Syracuse, New York," by Ralph Sanders, (2) Syracuse University; "Geocoding by the U.S. Census Bureau: The Evolution of the GBF/DIME System," by Joel Sobel, Geography Division, U.S. Census Bureau; "The Schoharie County Cooperative Program: A Case Study in Applied Geography," by Paul R. Baumann, (2) State University College, Oneonta; "Implications of Applying Geography," by John W. Frazier, (2) State University of New York at Binghamton; "Concluding Remarks," by Sarah Myers, American Geographical Society.

1. Abstract published.
2. Paper published in its entirety.

## INSTRUCTIONS FOR PAPERS PRESENTED AT ANNUAL MEETING OF MIDDLE STATES DIVISION, AAG

The program committee for the annual meeting of the Middle States Division, AAG, invites members of the Division to prepare and submit papers which present results of geographical research and are likely to command the attention of a substantial number of fellow geographers. Papers by graduate and undergraduate students are particularly encouraged. All papers submitted must be in accordance with the following specifications:

- 1) No person may present more than one paper, either as sole or joint author.
- 2) A typed, double-spaced original copy of the paper, on standard 8-1/2 by 11 inch sheets of bond-quality paper, and one additional identical copy of the full paper must be received.
- 3) The *maximum* acceptable length for each paper is to be *eight* (8) pages of text, double-spaced, *including* references cited. A limited number of bibliographical footnotes are permitted with each article, but informational footnotes cannot be accepted. Papers exceeding eight pages may not be accepted.
- 4) The heading for the paper should begin in the upper left-hand corner of the first page, 1-1/2 inches from the top and left hand margins, in the following format: title of paper (all upper-case); name of author (caps and lowercase, two lines below the title); address or affiliation (caps and lowercase, two lines below the name of the author). The main text of the paper should begin three lines below the last line of the address or affiliation. It should be indented 1-1/2 inches from the left-hand margin of the paper, at least 1 inch from the right-hand margin, and should be typed with paragraph indentation. Center headings, of one order only, should be typed entirely in uppercase letters and centered in the body of the text three lines below the last line of the paragraph which precedes them.
- 5) Authors who wish to cite references in the text should use a raised numeral following the passage to which it refers. All references should be listed in numerical order under a centered heading "REFERENCES CITED," following any "ACKNOWLEDGMENTS" at the end of the paper. Turabian (4th ed., 1973), *excluding chapter 12*, should be followed as a guide to all references.  
Examples:
  - a) *Books:* Kate L. Turabian, *A Manual for Writers of Term Papers, Theses and Dissertations* (Chicago: University of Chicago Press, 1973), pp. 78-124.
  - b) *Journals:* Richard L. Smith, "Reality in Reapportionment," *Political Annals* 52 (January 1972): 412-37.
  - c) *Documents:* U.S., Department of Commerce, Bureau of the Census, *United States Census of Population: 1960, vol.1, Characteristics of the Population*, pt. 6, California.

- 6) All essential tables and/or black-and-white line drawings (such as maps or graphs) must be submitted in a format suitable for publication without further processing, preferably as photographic reproductions (positives) or original line drawings with maximum dimensions of 5 by 8 inches. Titles should be placed above tables and below line drawings.
- 7) *Abstract*: A separate one-page double-spaced abstract no longer than 250 words will be submitted with the paper. It should begin with the word "ABSTRACT" and should be a positive, factual statement of the substantive content of the paper.
- 8) Visual-aid requirements and other requests for equipment must be submitted with the contributed papers even if only to say that the requirements are nil.
- 9) Accepted papers may be published in the *Proceedings*, but no guarantee of publication can be offered. Final decisions on papers to be published will be made by the *Proceedings* Editorial Review Committee. Abstracts will be published of those papers not accepted in their entirety.
- 10) The Program Committee asks that authors not send material under consideration for publication in the *Proceedings* to any other journal or publisher until a decision on the paper has been reached.
- 11) Papers and special session proposals should be submitted by 15 July to the incoming President, Middle States Division.