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## FOREWORD

The current volume of the Proceedings . . . is part of the continuing effort of the New York-New Jersey Division to provide its members and the geography profession with a record of the annual meeting of the Division. It is hoped that the publication of the Proceedings . . . will simulate greater participation in the annual meeting by the membership of the Division.

As in the previous Proceedings . . . papers appearing in this volume underwent relatively little editorial alterations. All papers were retyped and the position of the footnotes was altered to provide a uniform format. The Editor assumes the responsibility for all errors which result from retyping. Certain tables and illustrations were copied by an electronic stencil cutter and faithful reproduction was assured for only those drawings having definite sharp contrast. The authors and the Editor may agree that this was not the ideal method for handling illustrative material; however, it was the best one available under the present budgetary restraints.

These Proceedings . . . appear at a critical juncture in the affairs of the Division. We are privileged to welcome to our midst colleagues from Delaware and Eastern Pennsylvania who will play an active and salutary role in our undertakings henceforth. In recognition of this, the Division will henceforth be known as the Middle States Division.

George W. Carey  
Editor

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# HOUSING QUALITY AND GEOGRAPHY

by

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Have geographers studied metropolitan housing? The immediate response undoubtedly would be yes. Closer examination of the literature, however, would reveal that we have not been as concerned with housing and residential location as we would like to think. As students of "residential location," geographers have been markedly less aggressive in analyzing housing -- location and quality -- than we have been in studying other aspects of urbanization. We have, for example, been quite satisfied with the theoretical foundations laid out by human ecologists and land economists. While contemporary methodologies stress the need for a general "systems approach" in each of Geography's subfields, geographers "into the housing scene" have not yet acknowledged the basic dilemma of housing and residential location.

In a nutshell, the problem is that of fixed real estate inventories versus moving people and establishments who use these inventories. The problem is back of many if not all maladjustments in urban form and structure ....(1)

Accordingly, the urban system may be seen as a market wherein mobile populations must evaluate on existing, locationally fixed housing supply. Evaluation of such a system would require analyses of both the population redistribution process, and the aging process of residential structures. These will be briefly reviewed prior to a discussion of housing deterioration. In connection with the latter, the filtering process will be discussed, as well as functional and social housing depreciation. No attempt is made to be "holistic", nor to outline a "geography of housing." Rather, specific issues are touched upon, hoping to stimulate much needed research in these areas.

## THE POPULATION REDISTRIBUTION PROCESS

The concept of the population redistribution process has partially been based on two related inputs: in-migration and population growth. It may be illustrated by the following analogy:(2) the manner in which positive net in-migration affects urban spatial growth has traditionally been regarded as a pattern resembling the dispersion of syrup as it is poured over pancakes. The pouring of the syrup corresponds to the

population growth of a city attributable to in-migration, and the pancakes correspond to some spatial limit, such as a municipal boundary. Because migration entered through areas situated in the center of the city, they served as foci from which centrifugal growth occurred. It then follows that there exists a secondary migration operative at a somewhat different scale. This becomes apparent as people who have migrated into the urban system move away from the central foci.

This conceptualization of population redistribution clearly implies two necessary conclusions. The first of these appears to be more implicit. Suppose we consider population inputs aggregated into ethnic groups rather than as individuals. It can be concluded from this that the relative location in an urban area of any ethnic group would be a function of the length of time from their original entry into the urban system, if other things are equal.

Secondly is the importance of continued in-migration. The United States may be considered as having experienced two types of migrations into its cities. Of more than passing importance is the fact that these two migration producing systems have been "turned-off" since the end of the nineteenth century. The earlier of these systems was the immigration of millions of aliens to this country and, thus, to its cities. Political constraints, established early in the twentieth century, cut these surges of immigration to a trickle, by turning off the faucet of migration into America's cities. The second of these migrations was the mass movement of America's rural populace to urban centers. This trend continued to be of importance well after the political constraints had effectively halted foreign immigration. The culmination of this rural to urban transition came in its secondary phase -- i.e. the movement of millions of southern blacks to northern industrial centers. Because these demographic changes are approaching their end, it seems reasonable to assume that future population growth will be generated from within the urban system. Therefore, we may expect to find our dispersion model relegated to a place in history, replaced by another example of urban growth. Our new model will probably be based upon residential relocation as generated from within the urban system. A recent attempt has looked to "intra-urban" migration with the goal of operationalizing the concept of place utility.<sup>(3)</sup> Thus, geographers have broken with the past in that they have begun to examine the spatial aspects of the housing package [i.e. the quantitative spatial aspects of the dwelling, its site, and its situation.]

#### THE FILTERING DOWN CONCEPT

Only recently have geographers become aware of both

the extent, and conceptual ramifications of suburbanization. Until these were appreciated, the "syrup-pancake" model of urban population growth provided a simple connection between models of land rent and housing quality. Areas centrally located in the city, for example, were characterized as having both the densest and oldest housing. Geographers concerned with residential quality were thus afforded an easy escape in the sense that density often could be used as a simple surrogate for quality. Specifically, the model states that as population is added, the existing population (at least in the aggregate) disperses outward. As this continues through time, spatially fixed housing stock is "invaded" by succeeding population waves. Although not a perfect analogy, this does demonstrate that the newest, although not necessarily the best, housing may be typically found at the periphery. In the field of housing planning this is referred to as the filtering-down process, and is based upon the assumption that the people at the top of the economic scale can only be satisfied with new housing. (4)

Thus housing that is introduced at or near the top descends gradually through successively lower value strata. It is often contended that the needs for additional housing on the part of lower income groups can be met by the production of an adequate supply of new housing for the upper income groups. Thus, used homes would be released to be passed down to successively lower levels until the effect reached the bottom of the market. This process is popularly referred to as "filtering down" and is described most simply as the changing of occupancy as the housing that is occupied by one income group as a result of decline in market price, i.e. in sales price or rent value. (5)

Even with the relatively simple "syrup" model of growth from a single center, this concept was neither adequate nor fully operationalized. For example, data available often specified a relationship between this process and the population redistribution process. That is, units being filtered-down were occupied by successive ethnic groups. "Whether this phenomenon [was] necessarily accompanied by absolute or relative declines in values or rents is an open question." (6)

To carry the argument to contemporary research: the curtailment of population migrations into the urban system, the continued suburbanization of industry, and the increased specialization of the central city are some of the factors that will lead to a decrease in our ability as geographers to utilize "distance --land rent" functions as a surrogate for quality -- or for that matter, even density!

## THE FILTERING DOWN PROCESS AND THE GRAVEYARD HYPOTHESIS

Today, many centrally located parts of the city, that once provided housing for those newly arrived, are characterized by deterioration and blight. In planning for the residential redevelopment of these older areas, two policy alternatives have typically been considered.<sup>(7)</sup> The first alternative is based on the premise that historically the only land available for the rich to build upon has been located at the periphery of residential development. With continuing in-migration, the filtering-down process could not possibly have reversed itself spatially. But, as the argument goes, the termination of massive in-migration, coupled with a continuing move to the suburbs, will necessarily result in decreases in population and use intensity. It follows that redevelopment should actively be pursued in these older areas.

The premise, upon which the second alternative is based, tells us that the demand sector of the housing market exhibits high elasticity in trading accessibility for lower densities. Due to the high density development of older areas, the lower densities now demanded cannot be provided with in existing renewal programs. Structural forces, therefore, will cause continued choice of peripheral sites. Upon examination, it seems that neither redevelopment nor the existing renewal programs, will yield significantly different patterns of residential development. However, the implications for the redevelopment of central blighted areas are significantly different.

Two decades of experience with redevelopment seems to indicate that the second alternative has provided the framework within which the filtering-down process has worked in America. But, most redevelopment programs have been based upon the first.<sup>(8)</sup> This should lead one to formulate a "graveyard hypothesis" when considering the redevelopment of central blighted areas. If one were to draw an analogy of this filtering-down process to a like process affecting automobiles, we would find that cars which become obsolete are retired to the junkyard. However, no such spatial alternative exists for locationally fixed housing. Rather, vast areas of under-used housing, vacant structures, and land cleared of all architecture develop. This void may be paralleled to the increasing total acreage devoted to cemetery use. Just as it has not become fashionable to re-use human graveyards, so it has not become fashionable to re-use our housing graveyards.

## FUNCTIONAL VERSUS SOCIAL OBSOLESCENCE

To this point, we have been describing functional housing obsolescence. This concept, based upon real property, re-

volves around two explicit factors. The first is that the domain of real property is occupied sequentially through time, resulting in depreciation. Secondly, the continued depreciation of structures results in non-acceptance, or more popularly, blight. Hence,

Urban blight designates a critical stage in the functional or social depreciation beyond which its existing condition, or use is unacceptable to the community. (9)

Functional depreciation, then, may be simply defined as the deterioration of real property to the point where the capacity to provide a satisfactory performance is hindered. However, as a concept, functional depreciation

...ignores the fact that many of the urban areas which have suffered blight, poverty, and unrest, are areas of single-family homes which are, or once were, suburbs with the amenities the middle class are now thought to be pursuing. It does not explain why these areas began to deteriorate in the first place. (10)

The concept of social depreciation attempts to place the stimulus for the functional depreciation of suburban areas in a preliminary framework. For example, it was not uncommon for social scientists to attribute society's rejection of certain residential areas to specific deficiencies which existed in the area's housing stock. This causal relationship was considered to be directed from functional obsolescence to social non-acceptance. Indeed, the filtering-down concept is based upon abandonment of structures by the upper class. The upper classes are actively seeking new dwellings, the lower classes are passive in that they "flow" into a housing vacuum, newly created by the upper classes. Little explicit work has been done in considering the opposite, which was informally discussed by Gottman:

...the social obsolescence of a neighborhood often cause(s) the physical deterioration of its buildings to progress at a faster rate than would otherwise be expected, because maintenance costs are cut and less care is given to upkeep. (11)

That is to say that social obsolescence may be an active force in the causal relationship. Its effect may be seen in the growing physical deterioration of an area, the concomitant change of attitude toward it, and, the acceptability of certain uses within. (12)

## TYPES OF SOCIAL OBSOLESCENCE

Two factors, other than the specific structure, influence a homeowner's perception of his investment: (1) the condition of surrounding structures (i.e. the locationally-fixed housing); and, (2) the individual's perception of his neighbors (i.e. the mobile population). A recently completed, preliminary study of housing quality indicates that these two factors may yield clues to characteristic traits of social depreciation. (13) Resident homeowners in East Orange, New Jersey, an older "inner suburb" of the Newark SMSA, were questioned about their general "housing satisfaction" and, specifically, their willingness to retain at least the present level of housing quality through capital investments. Appreciating the informal sample, several sets of responses continually recurred.

The first set might be summarized as the ubiquitous concerns of parenthood and homeownership. Rising taxes, the quality of the school system, as well as the growing drug problem among the young are several typical elements.

Secondly, most respondents expressed more than the usual concern for public safety. An interesting facet of this is that most residents believed that, for the most part, this was not a "homegrown" problem. A renewed awareness of East Orange's proximity to Newark was evident as respondents repeatedly attributed their perceived "lack of safety", not to deteriorating police services, but to "invasions" by Newark youths. It is interesting that fully 2/3 of the sample listed Newark as their former place of residence.

Thirdly, residents were keenly aware of the demographic changes occurring in East Orange. During the sixties, the black population increased from just under 20% to an estimated 55% of the city's 80,000 persons. Additionally, it has been noted that the relative affluence of the average resident has declined during the last two decades. Recent census data should show that the median income in East Orange to be below the county median for the first time. Although the study was unable to determine whether this awareness was class- or racially-based, the effects were clear:

You know, the neighborhood is just changing... and why should I do any repairs when I may be gone by the end of the year.

No I'm not going to stay, and I'm not going to spend a dime cause I ain't gonna get it back when I sell.

Well yes its [the area] O.K. It's just too bad the only other whites left on are that Italian family. This used to be a real neighborhood, well cared for, and everything....

Thus, awareness and anticipation of further demographic change inhibited owners from actively seeking to maintain housing quality -- and encouraged only those repairs deemed absolutely essential.

These findings imply that social depreciation may be identified as either of two types: (1) it is a response to a real or implied demographic change; or, (2) it is a response to some implied qualitative change. Demographic changes may be dichotomized into a real and an implied dimension. The first, or real dimension, is characterized by some absolute demographic change in a neighborhood. This may be the transition of the area from predominately one racial or ethnic group to another. A more subtle example would be a trend toward shorter (or even absentee) tenure on the part of the homeowner. The second, or implied dimension, is the awareness and perception of the present residents of the area to these demographic changes. For example, a change in racial composition may be perceived as a change in the affluence of the area as well as one in racial proportions. Conversely, the response occasioned by implied change may exist in the absence of a real demographic change.

The demographic sector of social depreciation is closely related to the second type of social depreciation -- a response to some implied qualitative change. For example, implied demographic change may convey to the homeowner an impression concerning future rates of physical deterioration in the area. If this impression is negative, the homeowner may decide to decrease his own rate of repair and improvement. In concert, then, these factors appear to work somewhat like a "self-fulfilling prophecy."

#### CONCLUSION

While this dichotomous conception of social depreciation is embryonic at best, further refinement seems warranted for several reasons.

First place, while most attention has been focused on the "city" and its housing problems, little has been devoted to the "inner suburb". This area, typically characterized by one and two family, owner-occupied homes, has traditionally served as an important "way station" for those groups just obtaining ownership status. Cloaked in their heritage of resident-ownership and suburban classification, many of these "inner suburb" municipalities have failed to take notice of their aging housing stock.

Secondly, increasing numbers of black families are seeking home-ownership generally, and suburban locations spe-

cifically. Given the pattern established by previous groups, their goals may first be achieved in our "inner suburbs."

Finally, as David Birch noted very recently, "The relocation of blacks is, of course, only part of the story. If the quality of black life does not improve in the process, then the only effect would be to transfer some of the central-city problems to the suburbs."<sup>(14)</sup> The preceding statement on social depreciation would indicate a trend of accelerated physical obsolescence in suburban areas experiencing, or anticipating some degree of racial transition. If this trend is found in other than our unique location, blacks achieving home-ownership in suburbs may find their efforts have yielded little or no relative environmental improvement. Hence, given the rudimentary concept discussed above, the quality environment purchased by these new homeowners may simply be a function of the tolerance to integration displayed by those currently residing in this "zone of emergence."

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INFORMATION AND APPREHENSION: THE CONFLICT  
OVER THE COLUMBIA UNIVERSITY TRIGA MARK II  
NUCLEAR REACTOR

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The controversy surrounding the activation of a TRIGA Mark II reactor on the Columbia University campus illustrates the need to incorporate the principles of conflict theory into location theory.<sup>(1)</sup> Increasingly, the single decision-maker or decision-making body is being challenged, constrained and sometimes replaced by interest groups. In the last three years, for example, major decisions concerning oil pipeline construction in Alaska, arterial construction along the Hudson Valley, the building of a sewage treatment plant in Harlem, and the location of an international airport in the Everglades have been reversed, modified and/or delayed by interest groups. These groups, with different power bases, cooperate at varying levels to contest the lone decision-maker. If their power is sufficient, the single decision-maker may be forced to capitulate or bargain rather than face costly court delays, consumer boycotts, picket lines, community hostility and other costs.

The urban university is particularly vulnerable to pressure from interest groups.<sup>(2)</sup> In 1970, 341 degree granting 4-year colleges and universities were located in cities with a population greater than 480,000.<sup>(3)</sup> Their attempts to expand and modernize facilities and to stress traditional educational practices (e.g. curriculum and admission standards) are increasingly in conflict with the views held by surrounding communities.

Columbia University exemplifies the problem. Its inability to function as a single decision-making body has been graphically demonstrated twice in less than two years: (i) May, 1968--over the construction of a gym in Morningside Park; and (ii) November, 1969--over the activation of a small nuclear reactor on the campus. These demonstrations have been costly, an estimated \$3.5 million having been spent on the Morningside gym and \$0.7 million on the construction of the reactor.<sup>(4)</sup> Non-quantifiable costs have been: increased community hostility, some student enmity, and injury to the University's world-wide reputation.

Conflicting groups are prone to make exaggerated claims of popular support. The purpose of this paper is to test the effectiveness of the groups contesting the reactor in forming and influencing opinion. Specifically, we examine the influence of the conflicting groups by deliberately interposing a

bias. The subjects were 224 Columbia University students. The test was performed in two stages: first, a questionnaire was distributed to determine student opinion; then an attempt was made to influence student opinion by adding a new information source--a visit to the reactor facilities. A second questionnaire was then distributed to measure changes.

The paper is divided into three major sections: (1) a summary of the issues and opposing strategies; (2) an examination of the responses to the first questionnaire; and (3) a similar analysis of the second questionnaire. The immediate results of the study are limited. Students may not be the most important group to sample. And due to logistical and cost constraints the respondents were not randomly selected. Instead, faculty members in the geography department distributed the questionnaires within their classes.<sup>(5)</sup> However, in view of the fact that university students are supposed to be among the better informed members of society and that the reactor issue was vehemently pressed on and around the campus, the results are surprising.

#### SUMMARY OF OPPOSING ISSUES AND STRATEGIES

The 250 kilowatt TRIGA Mark II nuclear reactor has become a political issue. Involved are the university, community and student interest group,<sup>(6)</sup> and the City, State and Federal governments. However, the basic conflict is between the University and the community. The community has both specific fears concerning the reactor and more general grievances which have little to do with the technical issues of reactor safety.

The technical questions immediately raised by the community reflected real fears about the safe operation of the reactor and about the dangers resulting from the deliberate or accidental release of radioactive waste materials into the environment.<sup>(7)</sup> Numerous technical experts reassured the community that the reactor in question would not endanger the health and safety of the public.<sup>(8)</sup> Yet many community groups maintained their opposition, suggesting that community distrust of Columbia had become the major issue: the "core" value.<sup>(9)</sup> The hostility of some elements in the community was summarised by Mrs. Marie Runyon, a member of the Morningside Tenants Committee, at a three day public hearing held by the Atomic Energy Commission (AEC):

It is conceivable that the reactor is safe. You will never convince the residents of Morningside Heights this is so. We have been too mistreated to believe what Columbia University says.<sup>(10)</sup>

Resentment of University expansion within the neighborhood was first released in Spring 1968, when the University was closed and construction work on the Morningside Gym stopped. The spring disturbances also prompted the University to withdraw its application to the AEC for a permit to operate the TRIGA reactor, construction having been completed in 1967. Accordingly, the open hearings already scheduled by the AEC licensing board were postponed. By the time the University reapplied to the AEC in September 1969 for permission to activate the reactor, opposition within the community had intensified. Assemblyman, Franz Leichter (69th Congressional District) gave notice of a new community strategy:

There was little opposition in the past, but the issue was still very remote. '63, '64 and '65 were years when Columbia University could do anything it wanted anywhere. There has only been a change since May '68. (11)

At the open hearing into Columbia's application held in November the technical arguments were repeated, but the major source of conflict appeared to be distrust of Columbia and the AEC. Evidence of increasing opposition was disruption of the hearing by community and student groups, the shouting of anti-Columbia epithets, and the charge that the AEC was rubber stamping the application. (12) The AEC responded by indicating it would only consider technical questions. The issue was escalated from the community level to the City and State scale when State Assemblyman Leichter introduced a bill to prohibit the construction of any "atomic facility" in areas with a density greater than 100 persons per square mile. (13) Three weeks later, all eight Manhattan councilmen introduced a bill asking that no "nuclear device" be permitted to operate within the City. (14)

The AEC decision was expected in February, 1970. In early April, the AEC licensing board postponed its decision until at least mid-May to supposedly consider two technical questions: (i) the amount of radiation that could be released by an accident ("maximum credible accident"), and (ii) whether the reactor was a "testing facility" or a "research reactor". (15) In short, the issue has been escalated from the community level--Columbia advantage, to the city and state level--community advantage, and from a purely technical question to a political power contest.

#### IMPLICATIONS OF THE FIRST QUESTIONNAIRE

The first questionnaire was developed to classify student opinion and to determine influential factors and informa-

tion sources in their decision-making process. The responses to the questionnaire revealed that serious reservations existed with regard to the activation and operation of the reactor: 37% of those questioned were against activation; 42% were undecided; and only 21% were in favor. The questionnaire also revealed that the vast majority of undecided students felt inadequately informed as to the issues involved, but that even the proponents and opponents of the reactor who believed themselves to be adequately informed were ignorant of significant facts and events.

### Factors Contributing to the Initial Responses

Three factors were found to be independently influencing student opinion: (i) academic interest, (ii) location of residence, and (iii) length of stay at the university.

Academic interest--We suspected that science and math majors would be more likely to favor the reactor than social science majors. Generally, science majors have not been prominent among campus protesters and are committed to the type of academic study symbolized by the reactor. Conversely, social science majors have been prominent in opposing University policies toward the community and toward federally sponsored research. (16)

Responses classified by academic interest supported this hypothesis to a remarkable degree. Science majors supported the reactor almost unanimously (92%), whereas social science majors were either opposed (58%) or uncommitted (40%). A third group composed of humanity and history majors resembled the social science group; but a fourth group including biology, economics, and business majors were more favorably disposed toward the reactor. Biology and economics appear to be exceptions to the hypothesis. Biology, however, has an increasingly outspoken ecological component emphasizing conservation, while economics appears to be the social science closest in outlook to the pure sciences, emphasizing advanced mathematical techniques, scientific rigor in structuring research problems, and the use of computer systems in research programs.

Location of Residence--We hypothesized that residence near the University would alert the student to the community's pleas and to the alleged threat of pollution. The responses to the questionnaire supported this hypothesis: 43% of the students who lived in the community were opposed to the reactor, 39% were uncertain; whereas students not resident in the community were generally uncertain (47%) or in favor of the reactor (33%).

Length of Stay at the University--The questionnaire also re-

vealed that lower classmen were strongly represented in the undecided category (48%), perhaps reflecting their lack of commitment to an academic discipline and its outlook and to their unfamiliarity with community grievances.

### Influential Factors in Initial Perception of the Reactor

Those in favor of the reactor were overwhelmingly influenced by the proposed use of the reactor in training and research programs. Both the opponents of the reactor (66%) and the uncommitted (66%) indicated that they were most influenced by fear of pollution or a "nuclear catastrophe". Thus, as in the community, apprehension over the technical issue of reactor safety is raised first. Concern over the relationship of the University to the community was strongly manifest only by opponents of the reactor. However, we suspected that students opposing the reactor due to the "core" value would be highly resistant to change.

### Awareness of Issues and Events in the Initial Response

The supporters of the reactor claimed to be and were the best informed; the uncommitted were the least informed. A large proportion of the opponents claimed to have consulted sources other than the University and City newspapers. These additional sources tended to be books and meetings sponsored by community groups and Ecology Action. The additional information, emphasizing the relationship of the University and the community, was important but for only a small minority of the student sample. In fact, more than one-third of the students did not know that the reactor had been completed, while more than one-half were unaware of the widely publicized AEC public hearings. In short, their professed examination of University and City newspapers was imagined or cursory to the extent of being illusory. (17)

Summarizing, a favorable opinion tended to be associated with a science major and residence away from the community; a negative response with a social science major and local residence; and uncertainty with lower classman status. In addition, many students felt impelled to respond to an unsigned questionnaire without accurate information. Their opinions appeared to be developed around political and academic beliefs, and personal contacts. The overwhelming majority were thus not directly influenced by the contesting groups or the mass media.

### AN EXPERIMENT IN INFORMATION APPLICATION: THE SECOND QUESTIONNAIRE

The literature argues the importance of the per-

sonal experience. Rodgers suggests that impersonal information sources are most significant at the awareness stage and that personal sources are more important at the judgement stage.<sup>(18)</sup> Katz emphasises the importance of face-to-face contacts even when the population is nearly saturated by the mass media.<sup>(19)</sup> In addition the uncertain and misinformed state of most of the students had been uncovered through the survey. We therefore concluded that the provision of information by a face-to-face encounter with the reactor and its operators would probably result in a more positive attitude toward the facility.

Accordingly, approximately two-thirds of the students visited the reactor facility.<sup>(20)</sup> The remainder served as a control group. The results were striking. Sixty-two percent of those who visited the reactor changed their opinion; only seventeen percent of the control group modified their previous views. More important, sixty-four percent of those who changed their opinion adopted a more positive view of the facility. Thus the fears of the opponents and the uncommitted over technical issues ("shell" values) proved to be quite susceptible to modification. The long-term grievances relating to the community did not. More than three-fourths of those who remained or became opposed did so because of University policy toward the community.

#### SUMMARY

1. Columbia University's decision to operate a small nuclear reactor on the campus has been contested by a coalition of community and student groups. The issues are reactor safety and/or long-standing community grievances.
2. Student opinion is divided according to academic interest, length of stay at the University, and location of residence. However many students were uncommitted and the majority were ill-informed with regard to the issues and events surrounding the conflict.
3. A face-to-face contact with the reactor and its operators had a powerful impact on the students. Almost two-thirds adopted a more positive view. Those whose basic concern was community grievances remained adamantly opposed.
4. Thus, we concluded that representatives of the contesting groups had little influence on the vast majority of the students.

Questionnaire 1.

1. Do you favor the installation of a reactor on the Columbia campus? Yes \_\_\_ No \_\_\_ Uncertain \_\_\_
2. Do you feel adequately informed as to the issues involved? Yes \_\_\_ No \_\_\_ Uncertain \_\_\_
3. What sources have you obtained information from? (Check appropriate boxes.)  
City Newspapers .....  
Campus Newspapers .....  
Television .....  
Radio .....  
Conversation with other students .....  
Other (specify) \_\_\_\_\_

---

4. This information has related to the reactor's  
A. Uses .....  
B. Potential Dangers  
    1) Nuclear Catastrophe .....  
    2) Long-term Pollution Effects .....  
C. Government funding .....  
D. University policy toward the community .....  
E. Other (specify) \_\_\_\_\_

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5. The most important factor influencing your opinion is  
A. Uses .....  
B. Potential Dangers  
    1) Nuclear Catastrophe .....  
    2) Long-term Pollution Effects .....  
C. Government funding .....  
D. University policy toward the community .....  
E. Other (specify) \_\_\_\_\_

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6. Were you aware in advance of the open hearings held locally on this issue? Yes \_\_\_ No \_\_\_
7. Do you live in the Columbia vicinity (within a fifteen-minute walk)? Yes \_\_\_ No \_\_\_
8. Is your home in New York City? Yes \_\_\_ No \_\_\_
9. What is your major or area of special interest? \_\_\_\_\_
10. Which year are you in? Freshman \_\_\_ Sophomore \_\_\_ Junior \_\_\_ Senior \_\_\_  
Other category (specify) \_\_\_\_\_
11. To your knowledge, the reactor is in the planning stage .....  
    partially constructed .....  
    completed but not activated....  
    completed and activated .....

Questionnaire 2.

Approximately one month ago you answered a questionnaire relating to the installation of a reactor at Columbia University. Do not respond to this questionnaire if you did not complete the original questionnaire administered in the week beginning March 3rd.

1. At that time you were \_\_\_\_\_ for \_\_\_ against \_\_\_ uncertain \_\_\_
2. You are now \_\_\_\_\_ for \_\_\_ against \_\_\_ uncertain \_\_\_
3. In the intervening period what new information sources have affected your opinion?  
Rank if more than one.
  - a. No new sources..... \_\_\_\_\_
  - b. Campus newspapers..... \_\_\_\_\_
  - c. Television..... \_\_\_\_\_
  - d. Radio..... \_\_\_\_\_
  - e. Conversation with other students..... \_\_\_\_\_
  - f. Conversation with professors... \_\_\_\_\_
  - g. Visit to the reactor..... \_\_\_\_\_
  - h. Other (specify) \_\_\_\_\_

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4. The most important factor influencing your opinion is:  
Rank if more than one.
  - A. Uses..... \_\_\_\_\_
  - B. Potential dangers
    - 1) Nuclear catastrophe..... \_\_\_\_\_
    - 2) Long-term pollution effects. \_\_\_\_\_
  - C. Government funding..... \_\_\_\_\_
  - D. University policy towards the community..... \_\_\_\_\_
  - E. Other (specify) \_\_\_\_\_

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5. What is your major or area of special interest? \_\_\_\_\_

FOOTNOTES

- 1 Kenneth Boulding, Conflict and Defense, New York: Harper, 1962.
- 2 "Growing Universities Fight Cities for Room," New York Times, 8/30/70, p. 1.
- 3 James Cass and Max Birnbaum, Comparative Guide to American Colleges, New York: Harper Row, 1969.
- 4 Reactor information supplied by Professor John P. Felvinzi, Division of Nuclear Engineering, School of Engineering and Applied Science: October, 1970. Gym information supplied by Professor Julian Wolpert, Department of Regional Science, University of Pennsylvania: December, 1969.
- 5 The authors would like to thank Professors Gunther Krumme, John Oliver and Leonard Zobler for distributing the questionnaires in their classes.
- 6 Community groups which have become involved in the conflict include: Manhattanville-Morningside Neighborhood Council, representing Manhattanville Tenants Association, Grant-Morningside Neighborhood Group, Morningside Gardens Tenants Cooperators Committee, Manhattanville Community Centers, Inc. and Corpus Christi Church; Morningside Renewal Council; Morningside Tenants Committee and Riverside Democrats. The most active student group has been Ecology Action.
- 7 With regard to the possibility of pollution, the more informed opponents of the reactor indicated particular concern over: (i) the release of the radio active gas, argon-41, through the reactor's ventilation stack; and (ii) the disposal of the radioactive wastes which are the inevitable by-product of fission processes. Other fears related to external hazards such as the possibility of sabotage, earthquake or airplane crash. These technical issues are discussed in: Safety Analysis Report for 250 KW Mark II TRIGA Reactor (Pulsing) to be located at Columbia University, prepared by L.J. Lidofsky, E. Melkonian, M.G. Woram, (Columbia University, 1969).
- 8 Defenders of the reactor particularly emphasised the accident-free record of the nearly 40 TRIGA reactors already in operation on other college campuses and at research laboratories.
- 9 Boulding, Chapter 15, p. 312 discussed the concept of "core" and "shell" values. The first is stable, the second may be modified by discussion.

10 Columbia Spectator, 11/21/69, p. 3.

11 Columbia Spectator, 10/30/69, p. 2.

12 Columbia Spectator, 11/21/69, p. 3.

13 In the amendment "atomic facility" is defined "to mean and to include any facility wherein energy is released in the course of nuclear fission, nuclear fusion or other nuclear transformation." Such an all-embracing definition could perhaps be interpreted to refer to the decay of radioactive materials such as radium in the dial of a wristwatch and K14 in the human body.

14 Columbia Spectator, 2/5/70, pp. 1,3.

15 The difference between the two is based on the power level at which the reactor operates. A "testing facility" operates at a higher level. Columbia's reactor would normally operate at a lower level, but could reach "testing facility" levels. If the reactor is classified as a "testing facility", the application must be reviewed by the Advisory Committee on Reactor Safeguards before the licensing board can render a decision.

16 These differences by academic interest hold for National issues such as the Vietnam War; see for example a discussion of a survey of faculty headed by Professor Martin Trow of the University of California at Berkeley, New York Times, April 23rd, 1970, p. 1.

17 Between October 1969 and the first week of March, 1970, when the first questionnaire was distributed, articles, editorials, and letters to the editor appeared in eighteen issues of the Columbia Spectator and six issues of the New York Times,

18 Everett M. Rodgers, Diffusion of Innovations, The Free Press of Glencoe: New York, 1962.

19 Elihu Katz, "Communications Research and the Image of Society: Convergence of Two Traditions," American Journal of Sociology, 65:435-440, 1960.

20 The strike, beginning early in May reduced the number of responses to the second questionnaire by one-third. However the percentage of students identified as proponents, opponents, and uncommitted in Question 1 of both Surveys was almost identical. Therefore we assumed that the two-thirds responding to the second questionnaire adequately mirrored the larger first group.

PERCEPTION OF THE ENVIRONMENT: A PRINCIPAL FACTOR  
AFFECTING THE APPLICATION OF PLACE NAMES IN  
CENTRE COUNTY, PENNSYLVANIA

by

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In the past 25 years cultural geographers and other social scientists have been giving increased attention to the role which the perceived environment plays in man's use of his world. The perception of natural hazards and personal space are topics which have been undertaken with considerable success. This paper focusses attention on the effect of the perceived environment on the application of place names. The findings presented herein are based on field work and documentary research of place name usage in Centre County, Pennsylvania. (1)

Prior to discussing the topic, a brief description of the study area and maps used in the study is in order. Centre County covers an area of approximately 1,100 sq. miles in Central Pennsylvania, about 7/8 the size of Rhode Island. (figure 1) It has a population of 78,950, somewhat larger than the city of Schenectady, New York. The largest urban center is State College, the site of Pennsylvania State University, with a population of about 30,000 not including students. The Allegheny Front traverses the county along a northeast-southwest diagonal dividing the area into a sparsely populated, high eroded plateau to the north and west and a series of anticlinal and synclinal ridges and valleys to the south (figure 2). Approximately 85 of every 100 Centre County residents live in the Ridge and Valley section of the county, the vast majority of which reside in the Bald Eagle, Nittany, and Penn valleys. The contrast in topography between the northern and southern halves of the county results largely from horizontal layered sandstones and shales comprising the plateau and foothills and the alternating exposures of folded limestone, sandstone, shale, and quartzite strata forming the parallel ridges and valleys.

Maps were compiled of the geographic distribution of generic terms used in area place names. Three representative periods of the region's history were studied to ascertain changes in the application of generic names through time. Each of these periods is shown on the place name distribution maps together with symbols denoting the location of the names in the landscape and the status of usage of each name, e.g., initial use within a particular period, prior use in earlier period, obsolete name. (2) (The outlines of major upland and lowland features in Centre County (figure 3) are shown on the place name distri-

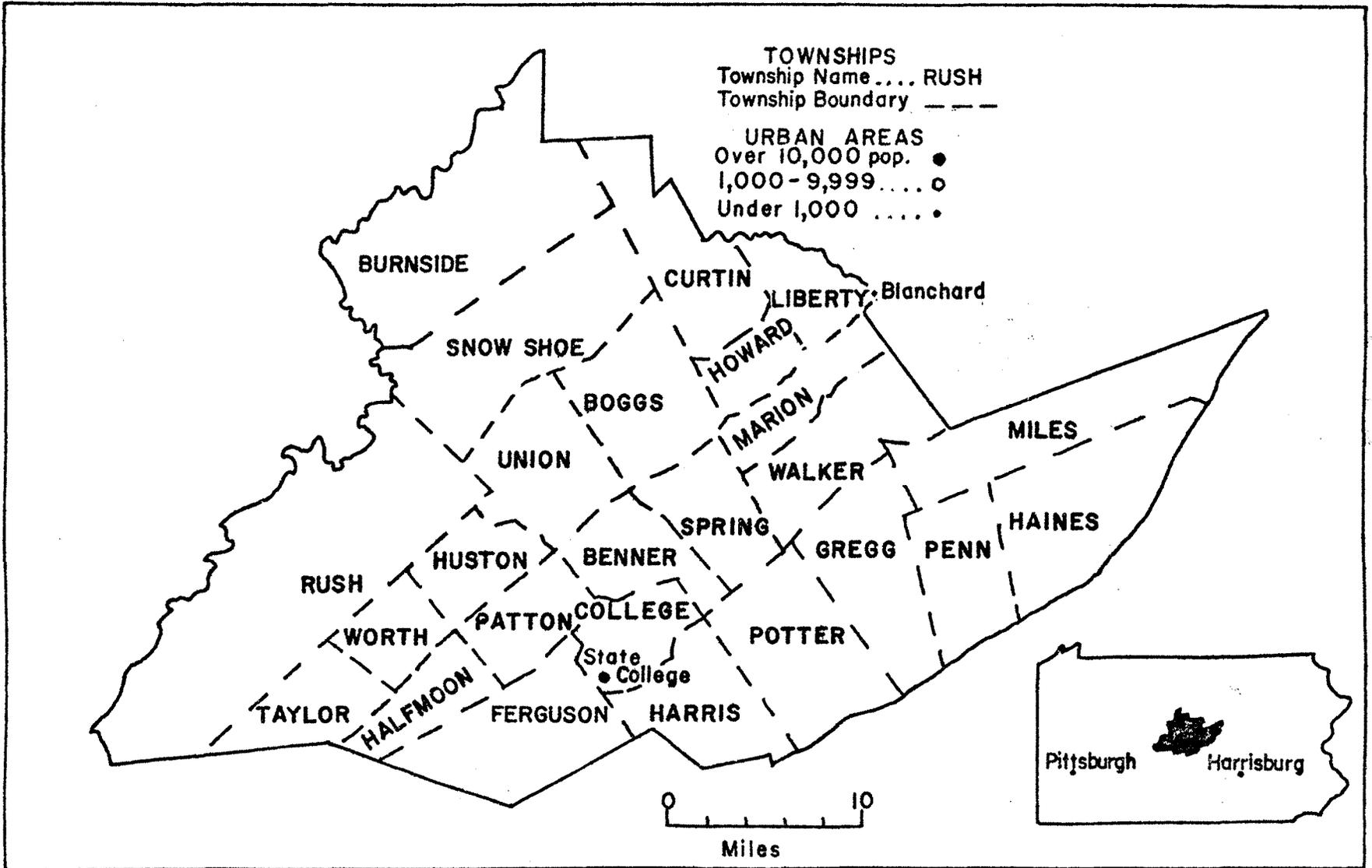


Figure 1. Centre County-Selected Political Subdivisions and Settlements

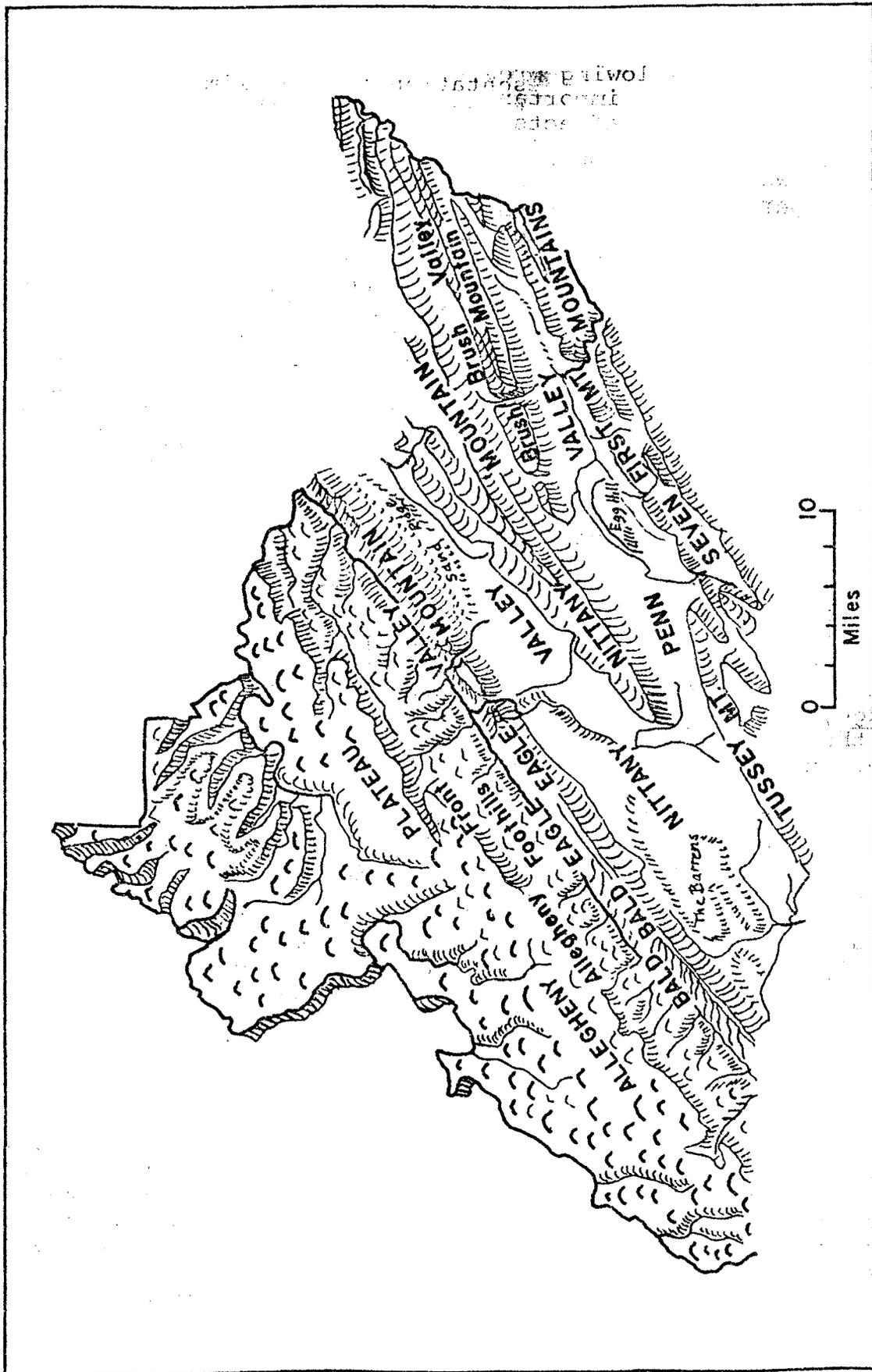


Figure 2. Physiographic Diagram of Centre County

bution maps).

The following presentation is a preliminary survey of some of the more important ways in which the environment as perceived by man affects place name usage. A more comprehensive study of this topic will have to await similar local studies elsewhere in the United States and the world. The impact of the perceived environment on the place name cover is reflected in the types of place names used, the area and features named, and the changes in the place name cover through time. Significance of an individual feature in the eyes of the viewer appears to be of paramount importance in the application and continued use of a toponym; conversely, lack of perceived significance helps to explain, in part, the absence of place names in certain areas. On the basis of names applied in Centre County, significance appears to be denoted mainly by the following characteristics: distinctive appearance, utility, and geographic position of the named feature. The remainder of the paper will be concerned with the manner in which man's perception of these characteristics of geographic features, i.e., appearance, utility, and geographic location, affects place name usage.

The aspects of the physical appearance with which we are concerned are size, shape, color, and state of repair. The latter relates to the general upkeep of cultural features. Perceived differences in size are reflected in both the generic and specific portion of place names. River, creek, run, mountain, ridge, hill, valley, and hollow connote subjective variations in the magnitude of upland, lowland, and stream features. This near universal tendency to classify phenomena by order of magnitude in the vernacular has been noted by Stewart and Zelinsky. (3) Within Centre County the near absence of streams sufficiently large to be recognized as rivers is seen in the rare appearance of river in area place names. Valley and hollow which appear more frequently in the name cover than river are restricted in their distribution because of their association with features of a particular size found only in certain sections of the county (Figures 4 and 5). Valley is restricted to the Ridge and Valley section of the county where most lowland features are more than 1.5 miles long and 400 feet deep. Hollows are found principally in the highly dissected plateau and foothills where lowland features are shorter and not as deep. Similar localized distributions are apparent in the use of mountain, ridge, and hill as toponyms. When size is reflected in the specific portion of a name, e.g., Big Swamp, Little Flat, it oftentimes results from a perceived size differential between two adjacent features. For example, two streams located relatively close to each other are named Big Run and Little Run. Big Run may be greater in size than its neighbor, thereby justifying its name in the eyes of the viewer. However, Big Run may actually be smaller in size than many other runs in the

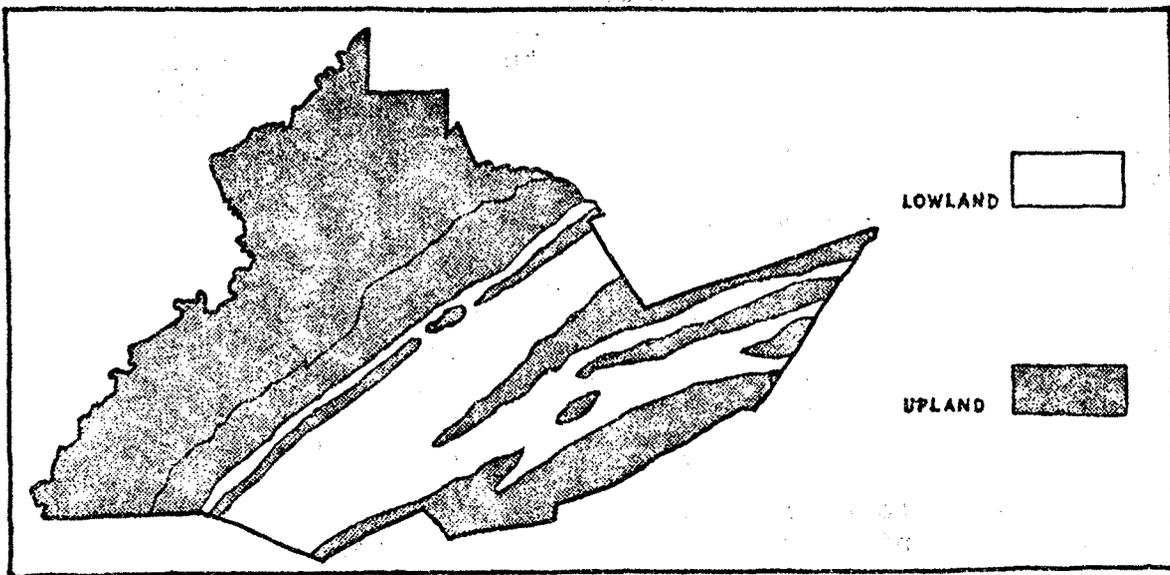


Figure 3. Upland and Lowland Landforms of Centre County

area and only seem large when viewed alongside Little Run.

The perceived significance of the size and permanence of stream flow proves to be a major factor in the decision of local residents to apply names to area streams. The effect which the tendency to name moderate-to-large perennial streams and ignore small intermittent flow is best seen in the distribution of run as a stream name in Penn Valley (Figure 6). Run is applied to only two features in the portion of the valley underlain by limestone, whereas in the eastern end of the valley, underlain by relatively impervious shale, the term occurs in five stream names. Apparently, the predominantly subterranean flow in the limestone section of the valley has restricted surface flow to such an extent that local inhabitants see no reason to name surface drainage. On the other hand, streams in the eastern end of the valley remain above ground and are apparently viewed as permanent features of sufficiently large size to deserve names. A perceived variation of flow between upper and lower reaches of a single stream has led inhabitants along the upper portion of the feature to use the name, Roaring Run, and residents in the limestone valley downstream to refer to the same stream as Dry Run.

In addition to size, shape and color often cause passersby to attach importance to a feature they would not otherwise have noticed. Color and shade are invariably expressed in the specific portion of a place name, e.g., Red Mill, Dark Hollow, whereas form may be denoted in either the specific or generic name, e.g., Chimney Rocks, 14 Mile Narrows.

The state of repair of manmade structures affects the degree of significance attached to such features by area residents. The decline in the use of mill as a generic name in community names during the late nineteenth century followed the abandonment and deterioration of sawmills and grist mills (Figure 7). A similar decline in the use of furnace as a community generic occurred after the dismantling or collapse of iron ore furnaces in the county.

A second characteristic of geographic features which tends to lend significance to said features and promote the application of names is perceived utility. The use of Karthaus Straight Water by loggers as the name for a straight-line segment of the meandering West Branch of the Susquehanna River near the village of Karthaus, Pa., is a fine example of the influence of perceived utility on name usage. As long as the feature was seen to be useful in the daily work of local people, the generic remained in use. However, with the decline of the lumbering industry in Centre County during the late 1800's, the name dropped from usage. Perceived usefulness of major

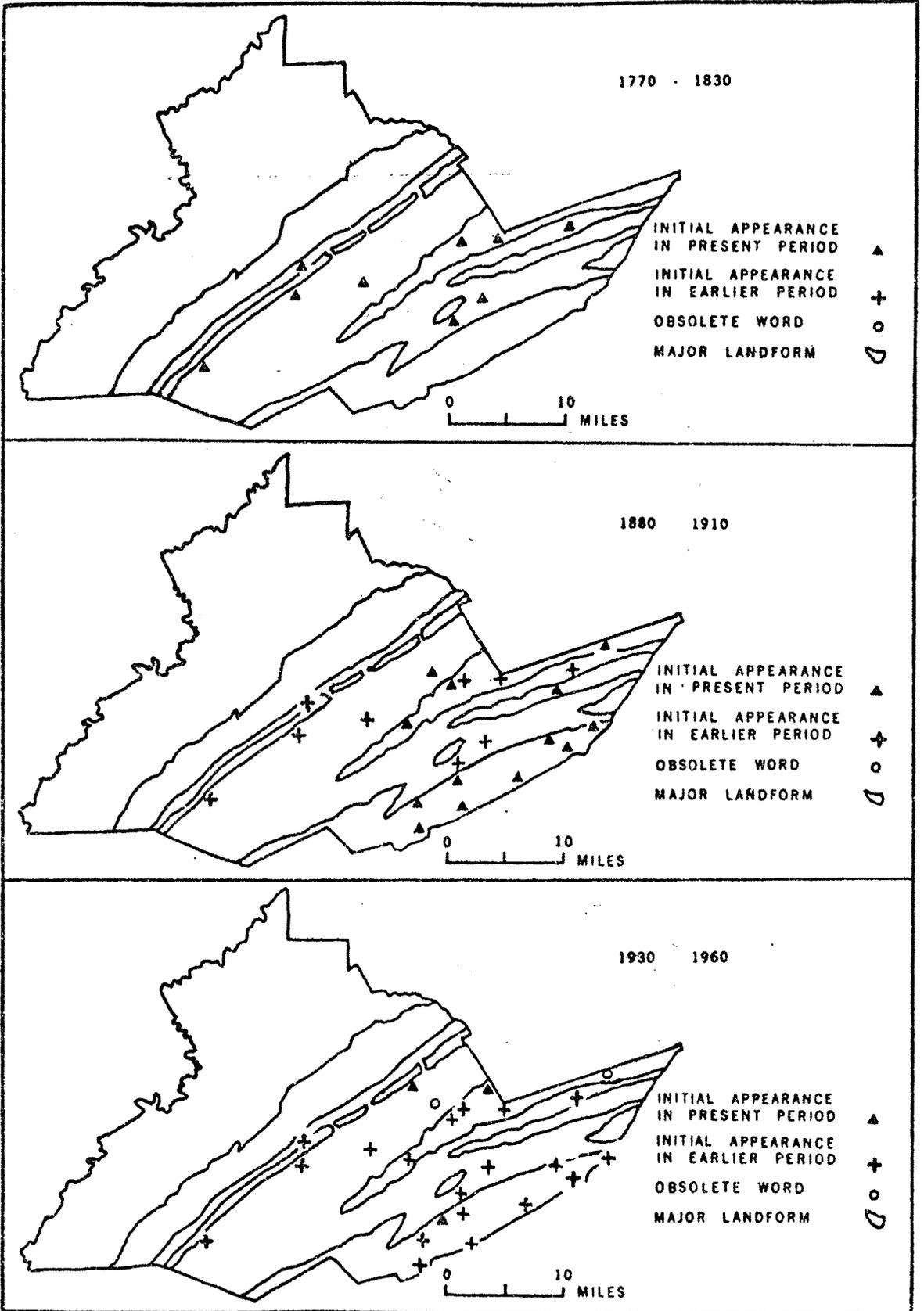


Figure 4 Distribution of Valley

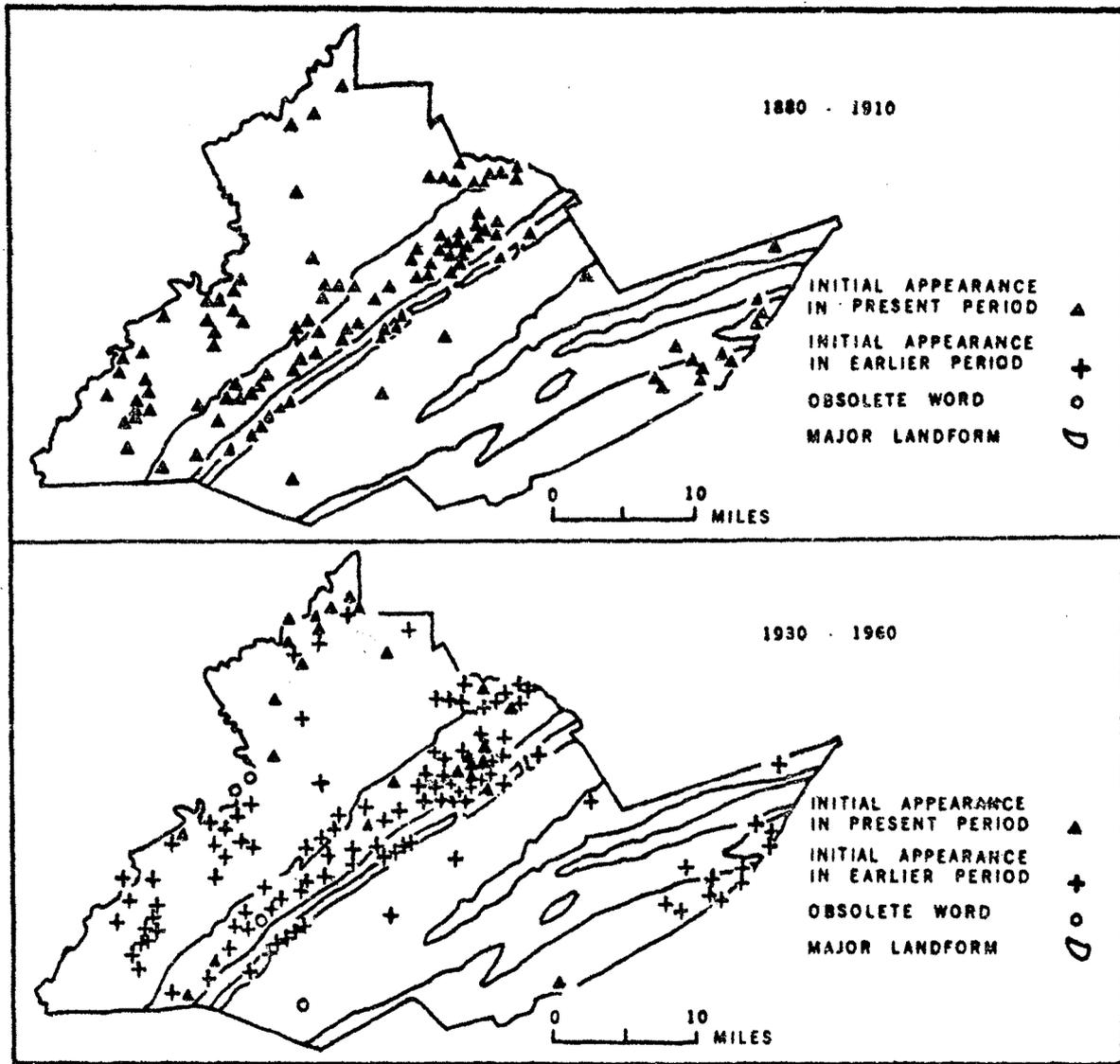


Figure 5 Distribution of Hollow

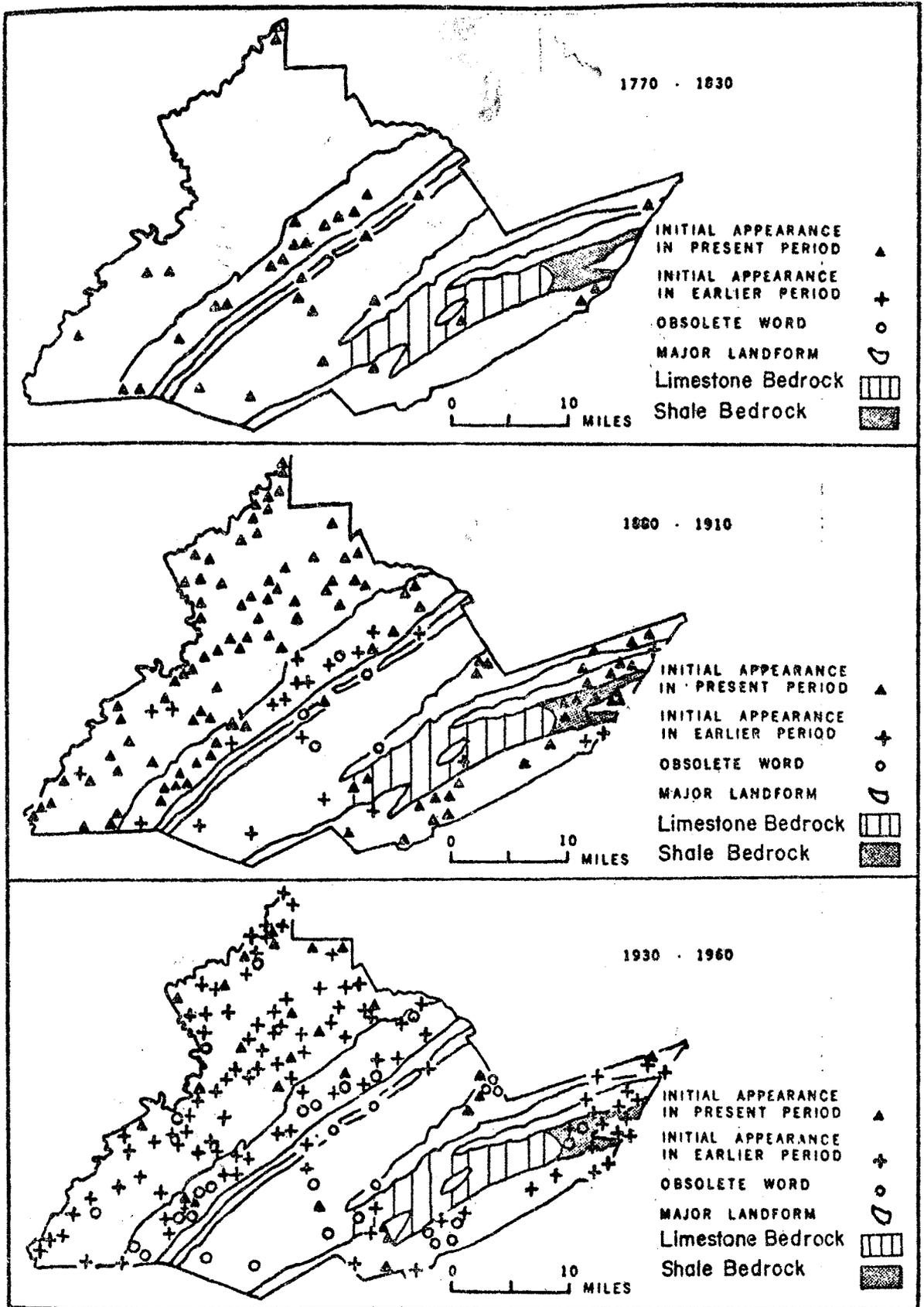


Figure 6 Distribution of Run

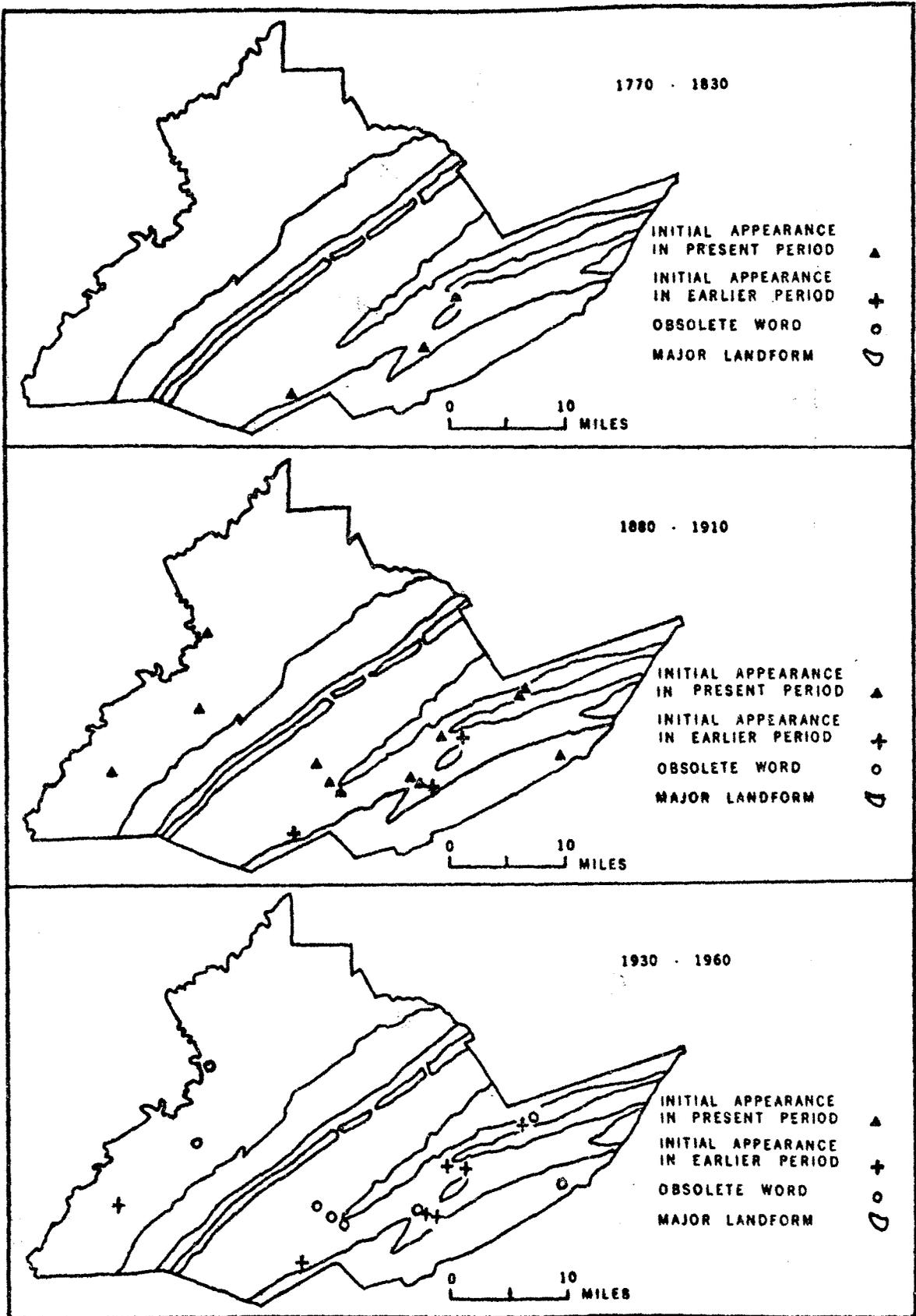


Figure 7 Distribution of Mill(s)

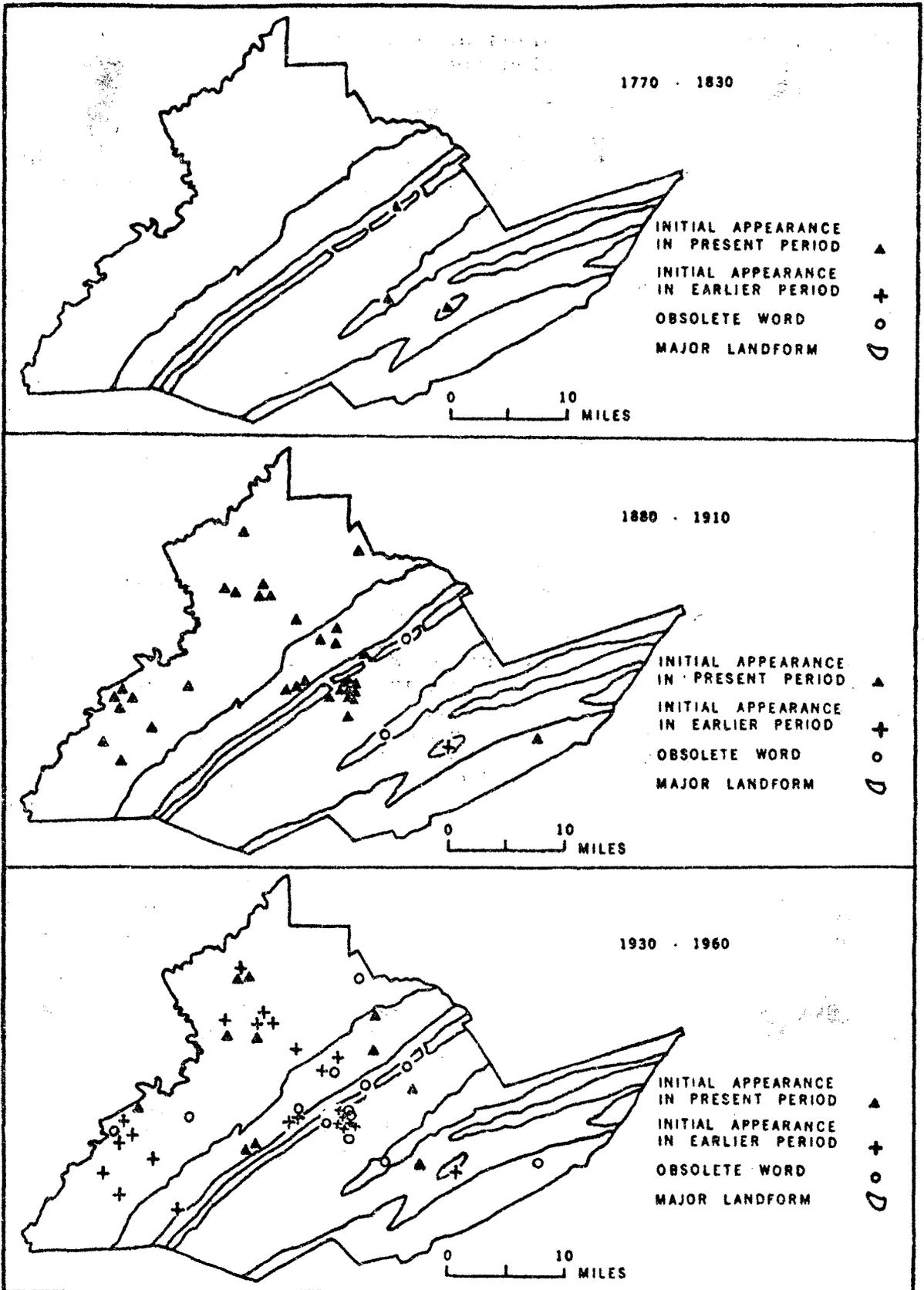


Figure 8. Distribution of Hill

valleys, and mountain ridges as landmarks during the early history of the county undoubtedly influenced the widespread usage of mountain and valley (Figure 4) in the place name cover during the 1770 - 1820 period. This assumption is reinforced by the conspicuous absence of the generic names, hollow and hill during the frontier period (Figures 5 and 8). These terms are normally applied to smaller features which would have been obscured by the forest canopy and of little use as landmarks.

Use of the generic, hole, for names of deep places in stream beds illustrates the selective manner in which the landscape is named. The one characteristic which the half dozen named holes in Centre County share is a reputation among the local inhabitants as excellent swimming spots or fishing sites. In one case, a hole had the adverse reputation as the site of a drowning. Unnamed deep places in streams nearby either lack the necessary distinction or have yet to be discovered.

The geographic location of area features in relation to the position of the viewer is a third characteristic involved in the application of place names. Whether or not the juxtaposition of the viewer and the feature is the cause which attracted attention to the feature is immaterial. What is important is the choice of name. Because the viewer's perception of the feature's location in the landscape will vary according to viewer's position, a single feature may have two or more names, each of which is used in separate localities. The northern ridge in the Seven Mountains complex is known as First or Front Mountain in southern Centre County (Figure 2), while in Mifflin County to the same feature is referred to as Seventh Mountain. The specific name applied to watershed divides will vary according to the side of the divide on which one lives. Blanchard area residents have named a nearby divide for the Marsh Creek Valley which lies on the opposite side of the ridge. The use of Blanchard Divide by Marsh Creek valley residents reflects the weekly trips across the intervening ridge to the closest market town.

The influence of the perceived environment on the place name process is much greater in scope than has been described in this paper. Preliminary research reveals that significance of landscape features in the eyes of the viewer is essential to the naming process. Three characteristics which tend to add significance to natural and cultural features have been discussed herein. With additional research others will be identified and the place name process clarified.

FOOTNOTES

- 1 Material presented in this paper is based on research conducted during 1965 and 1966 as part of a master of arts thesis, "Place Names of Centre County: A Geographical Analysis," Dept. of Geography, The Pennsylvania State University, 1969.
- 2 Symbols representing linear features, e.g. streams and ridges, are shown at a position midpoint between the extremities of such features.
- 3 George R. Stewart, Names on the Land. 2nd edition; Boston: Houghton Mifflin Company, 1958, p. 60. Wilbur Zelinsky, "Some Problems in the Distribution of Generic Terms", Annals of the Association of American Geographers, XLV, No. 4, (1955), pp. 319-349.

THE DECLINING WATER RESOURCE  
OF COLD SPRING HARBOR, NEW YORK

by

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"Long Island is the most rapidly developing area in the State, and the area where water problems are most pressing. Developing and protecting Long Island's precious water resources is essential for continued development." Governor Rockefeller's statement, if it was somewhat more than political rhetoric, perhaps bodes well for those towns of Long Island dependent on declining water resources. One such town is Cold Spring Harbor.

The settlement at Cold Spring Harbor came into existence and has been maintained through time by a remarkable juxtaposition of port site and fresh water stream. Study of pre-Columbian middens indicates a significant dependence by the Matinecock Indians on fish and shellfish from Cold Spring Harbor. In addition, the Matinecocks had a great variety and density of game to hunt in the valley of the Cold Spring Brook. This brook drains the north slope of the Ronkonkoma moraine, the intermorainal plain and the Harbor Hill moraine. The varied topography and vegetation in a relatively small area was permissive of a mixed fishing, hunting, gathering and even an ancillary farming economy of the autochthonous peoples.

The well-being of the Matinecocks in the Cold Spring area was one of the inducements attracting Dutch and English traders to Cold Spring Harbor. Another inducement was the protected inner harbor. A mid-bay bar extended halfway across the bay from the west side. The inner harbor in the seventeenth century was both deep and commodious.

In 1653 Englishmen from Connecticut purchased land from the Matinecocks and settled on the delta kame several hundred feet north of the confluence of Cold Spring Brook and Cold Spring Harbor. The original town site proved to be an excellent choice for almost 300 years. Potable water was readily available from several springs. The springs occurred where the saturated till was underlain by Cretaceous clays. There was adequate stock water from the brook and later from the lakes formed by the mill dams. However, as early as 1681 one can find legislation regarding the maintenance of water quality. The town council resolved on February 23, 1681:

Whereas complaint of the damage done to our brooks by geese, which is likely to be harmful, because sheep are caused to roam in the

woods and be exposed to the wolves, as they will not feed and water where there are geese, and the people take water from the brook for their own use, Resolved that no person shall keep geese or ducks upon the commons. (1)

The flocks of sheep and herds of cattle did so well on the prairie between the moraines that a significant tanning center developed at Cold Spring Harbor. Hides and skins were sent down the valley on the wagon road and tanned in the village. So much oak bark was used in tanning leather that the town council resolved on December 29, 1668 that, "no trees shall be felled within three miles of this town, upon the penalty of five shillings for every tree felled." (2)

One result of curtailing the tanning industry was greater specialization in wool production. By 1682 Cold Spring Brook was dammed at the present day site of the lower dam. A head of fifteen feet was secured at tidewater. Saw, grist, and woolen mills were all in operation by 1700.

During the first decade of the eighteenth century many of the springs around the village either stopped flowing or produced distasteful water. This was largely resultant from the denudation of the forest and from increasing numbers of livestock. Nevertheless, the slow growth of the community continued. Shallow wells provided copious supplies of potable water. Since as little as four feet of sand will act as a barrier to bacterial pollution, outhouses posed no major threat. (3) The solid waste-products of the livestock soon proved too valuable to crop agriculturalists to leave dispersed over the meadows. The first water crisis of Cold Spring Harbor was thus easily handled by switching from surface and spring water to ground water from the shallow till aquifer.

The availability of the Cretaceous clays at tidewater around the town led to the development of a brick industry. Bricks were fabricated in Cold Spring Harbor brickyards and exported from 1713 until the end of the nineteenth century. In 1880 400 local men were employed in mining, wood cutting, and the brickyard itself. (4) The woodcutting for the kilns and for the coopers of the nineteenth century played a major role in the accelerated silting up of the inner harbor. The coopers used local hardwoods for the manufacture of barrels. Complete barrels were produced to contain the flour being processed at local grist mills. Milling and shipping the flour from Cold Spring Harbor was such a lucrative trade during the high price periods of the Napoleonic Wars that a second dam was constructed. The upper dam was 2,000 feet upstream from the old mill dam. Water was led by means of a sluiceway from the upper pond along the discontinuous remnants of a delta kame to the south end of

town where the water was dropped to power grist, fulling, and spinning mills at tidewater.

With the European dumping of cloth on the United States market and the opening of the Genesee country, the fine woolen and grain milling industries of Cold Spring Harbor went into a decline. However, the involved entrepreneurs managed to establish a small whaling fleet that sailed from Cold Spring Harbor. At the height of the whaling industry in 1852, two barks and seven ships were provisioned at Cold Spring Harbor.<sup>(5)</sup> The co-operaage trade switched, from finished barrels for flour to barrel parts for whale oil. A small shipbuilding and shiprepairing industry further depleted the local forests of their remaining hardwoods.

Cold Spring Harbor's whaling industry went out of existence well before depletion of the herds or competition from petroleum destroyed American whaling. As the whaling ships were built larger to go on longer journeys, the inner harbor of Cold Spring grew smaller both figuratively and actually. Dock owners were regularly dredging berth space by the mid-nineteenth century. Accelerated erosion from the denudation of local forests had resulted in a decrease in depth of the inner harbor by the last third of the nineteenth century. After several ships had run aground trying to negotiate the channel to the inner harbor, whaling vessels stopped reprovisioning at Cold Spring Harbor. Another factor contributing to the demise of whaling was that the precursor of the Long Island Railroad was not built through or even near Cold Spring Harbor. The railroad followed an area of much less relief on the intermorainal plain.

The worldly entrepreneurs of Cold Spring Harbor managed, however, to save the village from economic stagnation. They again capitalized on the local water resources. The following article was prominently displayed in many publications of the New York-New Jersey area:

"Here (at Cold Spring Harbor) is a curious and valuable spring of fresh water whose ever gurgling flow appears strongly impregnated with iron, and perhaps some other mineral substances. The waters of this spring are believed to contain valuable medicinal properties, and instances are not wanting in which invalids, reduced to alarming extremes have been greatly benefitted and even restored to health by drinking of it."<sup>(6)</sup>

Many such advertisements were seen in New York papers at the turn of the century. However, this one was successful in attracting day excursionists to Cold Spring Harbor. Some

came to partake of the mineral water but many more came to enjoy the excellent bathing beaches. The narrow bar between inner and outer harbors proved to be an excellent beach with water conditions to almost everyone's taste. The north side dropped off steeply while the south side had extensive areas of shallow water in which children might bathe and shellfish could be gathered. The spring described in the advertisement lay just below the lower mill dam. In 1900 sapping from this spring was a major factor in the washing away of the dam. The beaches of the inner harbor were ruined, thus leading to the demise of the weekend recreation occurance. Excursion boats stopped calling at Cold Spring Harbor.

By the end of the first decade of the twentieth century the commercial, industrial, recreational economy of Cold Spring Harbor had gone into a major slump. The village was relatively inaccessible. The nearest railroad station was three miles away over a steeply sloping road while commercial vessels no longer called at Cold Spring Harbor. The federal port of entry status which had been granted by act of Congress in 1799 was withdrawn in 1913. A small breakwater that had been built during the whaling period had led to accelerated growth of the mid-bay bar. After the dam burst, the bar blocked all but a 100 foot wide passage to the inner harbor. The complex spit at the east end of the bar made two ninety degree turns necessary in order to enter the inner harbor. The very factors that were repellent to continued commercial occurance served as an attractant to the modern occurance of Cold Spring Harbor.

The very wealthy had discovered Cold Spring Harbor during the recreational occurance. They regularly visited the area by yacht. The demise of the weekender activity probably was the final attractant leading many to build magnificent cottages around the bay. From 1920 through 1960 the population of the village remained relatively static. Cold Spring Harbor was a service center for surrounding great estates. The town had a population of 1705 in 1960 while the census tracts lying in the drainage basin had a population of 10,603. By 1970 the town population of the drainage basin has increased 94 percent to over 20,000. This rate of increase was almost double the rate for all of Suffolk County.<sup>(7)</sup> Detailed explanations for this phenomenal growth are beyond the scope of this paper. Simply one would ascribe the growth to the extension of expressways, the filling up of the land in Nassau County, and the attraction of the beautiful terrain. What concerns this author with respect to the present residential occurance is, how to maintain an adequate water resource.

The quantity and quality of the inner harbor has deteriorated significantly in the last decade. Today the inner harbor has an area of 97 acres. In 1960 the comparable figure was 112 acres. In addition, of the 97 acres of today, only 50 acres have

a mean low water depth in excess of three feet. When the English first sailed into the inner harbor there were almost 130 acres of considerably deeper water. As much harbor has been lost in the last decade as was lost in the preceding 300 years. The major factor is the rapid increase in population and the nature of the new settlement. The building boom of the last decade has been exclusively in single family dwellings on lots of one acre modal size. The developers have in too many instances clean cleared the land of all trees.

At or close to the time of the new home owner taking title a lawn is usually started. Unhappily, the decade of the nineteen sixties was one of the driest on record.<sup>(8)</sup> From 1963 through 1966 Cold Spring Harbor experienced the most severe drought of record. The average annual precipitation for Cold Spring Harbor is 44 inches. During the four years drought there was a 38.15 inch departure from the average or almost one year's normal precipitation was lost. Resultant from the drought most of the new lawns did poorly. When, in 1967, fifteen days had rainstorms of short duration with total falls exceeding one inch, deposition in the inner harbor reached a new high.<sup>(9)</sup>

Fortuitously, soon after the construction of new homes, ground water recharge basins are established, thus slowing the erosion and deposition in the bay. One minor disadvantage of the groundwater recharge basins is that the maximum flow of the Cold Spring Brook has been reduced, thus reducing the outflow from the inner harbor which had a minor scouring function. Accelerated erosion also has a deleterious effect on the water table. Fine materials are still washing into the sumps at rapid rates. The clays and silt serve to reduce the porosity of the settling basins and eventually the percolation basin. The result is increased evaporation and transpiration with a resultant lowering of the ground water table.

The obvious solution to the silting up of Cold Spring Harbor is to dredge both channels and mooring sites so that the harbor can continue to offer safe haven to the more than 300 pleasure craft now moored there. Between 1955 and 1959, 550,000 cubic yards of material were dredged from the inner harbor. In 1960 a landowner in adjacent Oyster Bay brought suit against the Town and the dredging firm. The case was first decided in the Supreme Court of New York in 1963. The decision was that, "the underwater land in issue belongs to the Town of Oyster Bay all the way over to the high water mark on the Huntington side".<sup>(10)</sup> Not until 1967 was this decision reversed by the Appellate Division. The ongoing result of the boundary dispute is that no dredging can take place in the inner harbor. Hence, to maintain the size of the existent mooring site, erosion must be controlled.

Unhappily, the quality of water in the inner harbor is

also deteriorating. Until 1966 it was possible to take hard and soft clams from the inner harbor. From 1966 until the present, the Division of Marine Fisheries has closed the inner harbor for shell fishing. The Public Health Service recommends an upper limit of 70 coliform bacteria per 100 ml of water. The coliform median for the inner harbor has been 190 per 100 ml. On July 12, 1966 a figure of 11,000 was recorded at one site. (11) During the summer season bacterial pollution is at its worst. The major sources of pollution are the village, the restaurants and the pleasure boats. Cold Spring Harbor has no municipal sewer system. Wastes are conducted into cesspools and/or septic tanks on an individual basis. Homes, shops, and especially the numerous seafood restaurants adjacent to the harbor periodically leak raw sewerage into the harbor. There is an immediate need for a municipal sewer and processing plant. The problem of dumping marine toilets has theoretically been solved. New stringent laws will ultimately stop this source of pollution, if the laws are enforced.

Potable water is of less immediate concern than the obviously deteriorating harbor. Of course, ultimately as in the past potable water will be more important. The cost and the quality of potable water have increased and decreased respectively in the last decade. The early settlers were able to use surface water. By 1970 Cold Spring's potable water was coming from the third and fifth deepest wells of the sixty-seven reporting in Western Suffolk County. In addition to the higher drilling and pumping costs, the flow from wells in the Magothy formation generally decreases with depth. By the late nineteen sixties the glacial aquifers were considered too unpredictable for continued dependence. During the drought the maximum drop in the local water table was fourteen feet. (12)

Of much greater importance in conditioning the switch to deeper aquifers was the growing occurrence of ABS (alkylbenzenesulfonate). ABS levels were high enough in water drawn from the glacial aquifer to cause foaming (1 ppm). The occurring levels of ABS were not considered toxic. However, the U.S. Public Health Service recommends that water with an ABS concentration in excess of 0.5 ppm not be used for drinking as it is indicative of cesspool contamination. The ABS problem may be solved in the immediate future. Suffolk County may outlaw the sale of detergents. Without continuing inputs of ABS, natural dilution will ultimately reduce the concentration below detectable levels. However, the more serious problems of bacterial contamination will necessitate sewerage.

No ABS has been detected in the Magothy aquifer of Cold Springs Harbor. However, there is a slow increase of manganese and chloride ions even in this deep aquifer. In short, while

the cost of water is increasing, the availability and quality is deteriorating. There are several possible palliatives to the problem. Barrier injection wells using treated sewage plant effluent would ward off the newly developing problem of saline intrusion. Obviously this first involves the building of sewers, which in itself will alleviate many of the developing problems. If the rate of salt water intrusion was to increase appreciably due to accelerated pumping from the aquifers, saline pumping troughs have proved to be feasible at other locations. Another approach that has not as yet been tried in Cold Spring Harbor is injecting treated waste waters into recharge basins, or more simply, pumping water from skimming wells in the glacial aquifer into the Magothy aquifer. All of these solutions are expensive. However, the high income community of Cold Spring Harbor is in a unique position to adopt some set of palliatives. With success, Cold Spring Harbor can serve as a model for water management to other communities of the North Shore of Long Island.

Through time the settlements of Cold Spring Harbor have been dependent on the beautiful and utile juxtaposition of fresh and salt water. Management of these resources have always been practiced to some extent. With the recent rapid increase in population, the populace must be made aware of their declining water resource. Hopefully, this paper has served not only that function but also has presented several approaches to maintaining and improving the water resource.

FOOTNOTES

- 1 Roy E. Lott, Huntington Tap Roots, Huntington, New York, 1968, p. 25.
- 2 Ibid., p. 15.
- 3 Thomas H. Wiggin, Report on a Comprehensive Plan for the Development and Distribution of the Available Water Supply of Suffolk County, Long Island, New York. Brightwaters, New York, 1957, p. 26.
- 4 Walter K. Earle, Out of the Wilderness, Cold Spring Harbor, New York: Whaling Museum Press, 1966, p. 29.
- 5 Ibid., p. 48.
- 6 Henry Hazelton, The Counties of Nassau and Suffolk, Long Island, New York, 1609-1924. New York: Lewis Historical Publishing Company, 1925, II, 826.
- 7 Long Island Lighting Company, Current Population Estimates 1970, pp. 1-17.
- 8 Philip Cohen, "Hydrologic Effects of the 1962-66 Drought on Long Island, New York," "U.S.G.S. Water-Supply Paper 1879-F". Washington, D.C.: Government Printing Office, 1969, pp 4-16.
- 9 U.S. Department of the Interior, Water Resources Division, "Climatological Records for Long Island, 1959-1970."
- 10 Town of Huntington Trustees, Minutes, 1964, p. 89.
- 11 Quentin Bennett, "Cold Spring Harbor Shellfish Growing Area #48." New York: Division of Fish and Game, State of New York Conservation Department, 1969 , p. 13.
- 12 U.S. Department of the Interior, Water Resources Division, "Sample Well Records N1242, N1243, N1244, 1941-1970."

A PRELIMINARY VIEW OF THE POSSIBLE ASSOCIATIONS  
BETWEEN CULTURAL BACKGROUND AND AGRICULTURE IN NEW JERSEY  
DURING THE LATTER PART OF THE EIGHTEENTH CENTURY (1)

by

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By the middle of the eighteenth century New Jersey was already recognized for her extraordinary agricultural productivity and was acknowledged to be an extremely important producer of wheat for export, largely through the ports of Philadelphia and New York. (2) Little, however, is known about the actual distribution of wheat production, or, for that matter, the distribution or relative importance of other agricultural products within the colony.

In addition to the lacunae concerning the distribution of agricultural production, little is known of any possible links between agricultural preferences and production and cultural background. Of the British North American Colonies, New Jersey was by far the most diverse culturally, with many cultural groups possessing distinct regional concentrations. In the past, general statements have been made about the agricultural preferences and abilities of various cultural groups in North America during the colonial period and thereafter. Recently, efforts have been made to discredit many of these generalizations, with some success, especially in regard to Pennsylvania. (3)

It is the purpose of this paper to present an overview of the distribution of cultural groups in New Jersey during the latter part of the eighteenth century and then proceed to indicate what is currently known of the distribution of crops and domestic animals. Conclusions will then be drawn as to possible links between these distributions.

Settlement in New Jersey by Europeans began sporadically before the middle of the seventeenth century and by the 1660's footholds had been gained on the Inner Coastal Plain (Fig. 1) and the Piedmont. Much of the Piedmont and Inner Coastal Plain had been settled by agriculturists before 1700 while parts of the Highlands and Ridge and Valley physiographic provinces were as yet unsettled by the middle of the eighteenth century. The Outer Coastal Plain remained very sparsely settled throughout the eighteenth century. Accessibility to the sources of European and later American immigrants as well as fertile agricultural soils encouraged the early settlement of the Inner Coastal Plain and the Piedmont. Extremely sparse settlement in the Outer Coastal



Plain was in large part due to the infertile nature of the soils available in most locations. Relatively late settlement in the Highlands and Ridge and Valley provinces was largely a function of their relative remoteness from the sources of immigration, but was also in part due to infertile and/or poorly drained soils in the northern glaciated section.

The regional concentrations of major cultural groups in New Jersey may be revealed in several ways. One method concerns estimates of the numbers of various national groups by county for the year 1790 (Table 1). These estimates were made by prominent local historians at the request of the Director of the Bureau of the Census.<sup>(4)</sup> Several of these estimates appear to be questionable. The fifty percent figure given for the Swede-Finn population of Cape May County (Fig. 2) for example, appears to be much too high, and the dearth of Dutch settlement in Monmouth County by 1790 is demonstrably incorrect, on the basis of the distribution of Dutch Reformed churches alone.<sup>(5)</sup> The category "Scots, Scotch-Irish and Irish" exists as a result of combining the "Scotch" and "Irish" populations in the original estimate. The rationale behind the decision to combine these data is that the term "Irish" has been used for both Catholic Irish and Presbyterian Scotch-Irish, two quite distinct cultural groups. Also, in several cases the total estimated numbers for "Scotch" and "Irish" were held to be exactly the same, which is hardly likely.

A later, probably more accurate estimate, relied upon analyses of the surnames recorded for the residents of the various counties.<sup>(6)</sup> Because of the loss of New Jersey's census records, the estimate rests upon Revolutionary muster rolls for most counties, the assumption being that nationalities were represented in the army in the same proportion in which they existed in the general population. In the case of Cape May, Hunterdon, and Somerset Counties, not even Revolutionary muster rolls were available and estimates were made from indices of wills probated and extant lists of residents. Unfortunately, the published data only included the Dutch and Swede-Finn ethnic stocks. These estimates markedly increased the percentages of Dutch population in Bergen (74.2%), Monmouth (30.1%), and Somerset (79.8%) Counties, and decreased the Swede-Finn population in Cape May County (8.3%). Otherwise, the later, more systematic study is remarkably consistent with the earlier estimates for the Dutch and Swede-Finn groups.

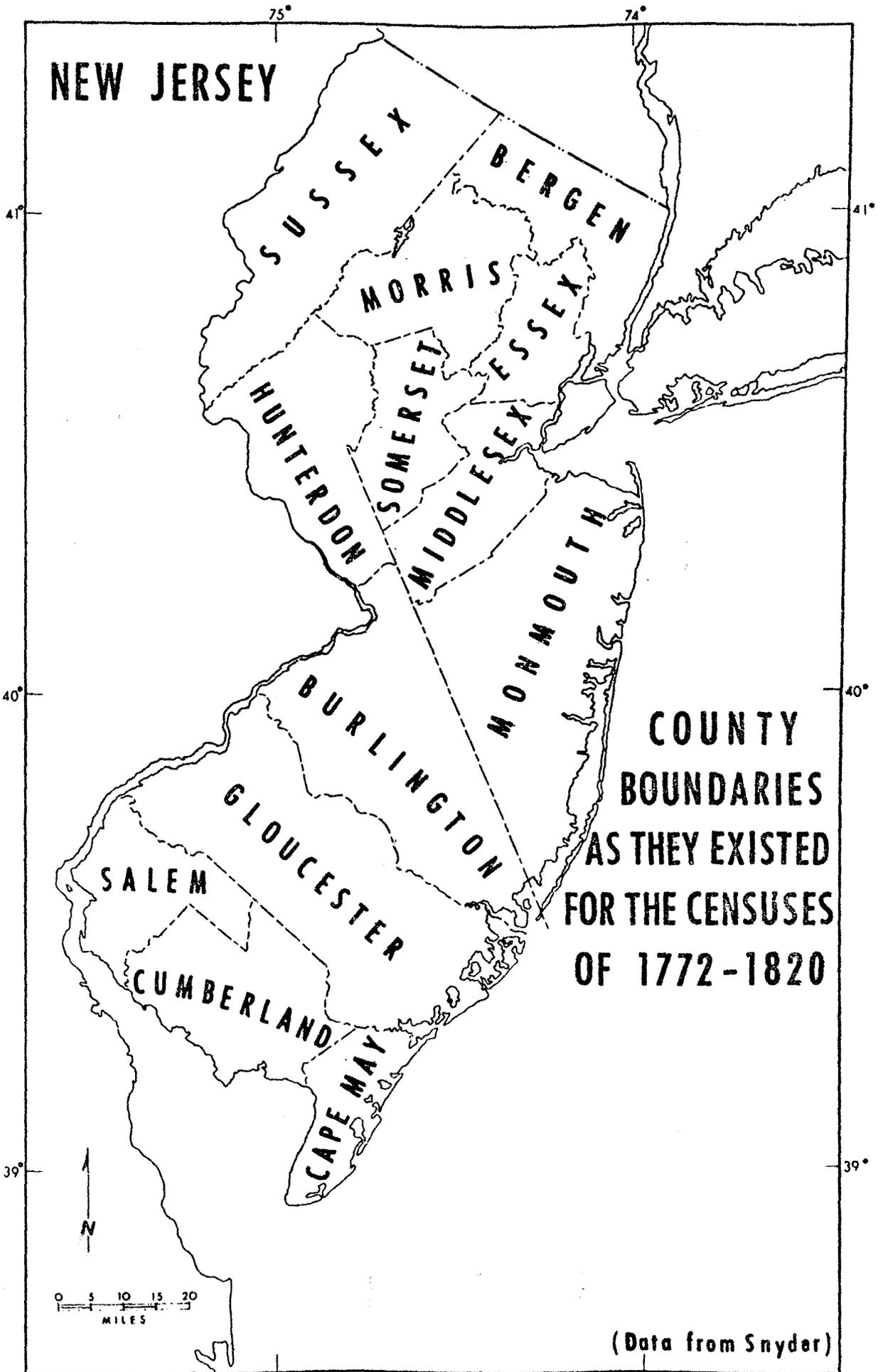
The distributions of ethnically or culturally linked churches<sup>(7)</sup> or meetinghouses,<sup>(8)</sup> county histories, and general statements by authorities of the day<sup>(9)</sup> make possible additional refinement of Table 1. Thus, the "English" population of north-eastern and central New Jersey is seen to be of New England deri-

Table 1

## Estimated Percentages of National Stocks Among the White Inhabitants of New Jersey, By County - 1790

County	English and Welsh	Scots, Scotch-Irish and Irish	Dutch	French	Germans	Swedish and Finnish	All Others
Bergen	15.0	10.0	40.0	15.0	20.0	-	-
Burlington	85.0	10.0	-	-	-	5.0	-
Cape May	50.0	-	-	-	-	50.0	-
Cumberland	68.0	10.0	-	-	10.0	12.0	-
Essex	60.0	20.0	15.0	5.0	-	-	-
Gloucester	80.0	5.0	-	-	5.0	10.0	-
Hunterdon	30.0	20.0	25.0	-	25.0	-	-
Middlesex	38.0	36.0	20.0	4.0	2.0	-	-
Monmouth	75.0	20.0	-	3.0	2.0	-	-
Morris	55.0	15.0	10.0	-	20.0	-	-
Salem	83.0	10.0	-	-	-	7.0	-
Somerset	59.1	6.0	30.0	1.9	0.5	-	2.4
Sussex	55.0	10.0	15.0	-	20.0	-	-

# NEW JERSEY



**COUNTY  
BOUNDARIES  
AS THEY EXISTED  
FOR THE CENSUSES  
OF 1772-1820**

(Data from Snyder)

vation and Congregational or Presbyterian affiliation, while that of the southwestern portion of the state is English, with a Quaker predominance.

Data on the gross distributions of crops in New Jersey are available in two major sources: newspaper advertisements of the day, and claims for damages incurred during the Revolutionary War. Newspaper advertisements of property in New Jersey covering the years 1704 to 1782 have been reprinted in sixteen volumes of the New Jersey Archives.<sup>(10)</sup> The reproduction of advertisements on property which appear in the New Jersey Archives is the only source of data on real property which covers the entire state, although one may question whether or not a fair sample of the properties available for sale were ever advertised in newspapers. Recently-settled northwestern New Jersey, for example, tends to be under-represented as do Essex and Bergen Counties. Nevertheless, the advertisements are valuable in that they pinpoint locations and often include detailed descriptions of the properties and the crops either in the soil or reputed to grow well on the sites. The names of property owners or lessees are also given.

The northeastern counties are well represented, however, in the manuscript inventories of damages incurred as a result of the actions of British troops and their adherents during the Revolutionary War.<sup>(11)</sup> The damage claims for Bergen, Essex, and Middlesex Counties, for example, pinpoint locations by township or village, those for Somerset County do so only occasionally. These claims, for growing crops actually destroyed in the fields, added to the data collected from the newspaper advertisements, have been plotted on maps to provide a gross distribution pattern of the major crops during the latter part of the eighteenth century.

The gross distributional pattern of wheat (Fig. 3),<sup>(12)</sup> without question the major commercial crop, indicates that it was almost universal in the areas of better soils. Surnames associated with the crop from both the advertisements and the damage claims appear to belong to all ethnic groups. The crop appears to be absent in the Outer Coastal Plain with the exception of a cluster of production on the Cohansey in the southwest and a farm reputed to grow wheat in Cape May County. An extensive gap in the distributional pattern also occurs on the Inner Coastal Plain in Gloucester County. The extreme north of the state appears largely free of the crop, but here the data are usually scanty and in this area the map cannot be taken to be at all an accurate representation of reality.

The distribution of rye (Fig. 4), a much less valuable grain than wheat and less desired in New Jersey's overseas markets, exhibits much the same pattern as does that of wheat, except for a much lower frequency of advertisements and a some-

what lower frequency of war damage claims. At least by the statements of advertisers, land which produced rye was located in the Outer Coastal Plain. This is substantiated by tradition in many Outer Coastal Plain communities.<sup>(13)</sup> With rye as with wheat, soil quality rather than cultural predilections seems a better explanation for gross distribution.

Much the same can be said for the distribution of Indian corn as a crop (Fig. 5). As with rye, the crop was grown in the poorer soils of the Outer Coastal Plain. As with rye there is a concentration in the poor soils of the Inner Coastal Plain in Gloucester County, tending to reinforce faith in the general accuracy of the distribution portrayed.

The Revolutionary War Damage Claims also provide data on the relative frequencies of the crops and animals either destroyed or carried off by the troops. My working hypothesis in analyzing the data was that the frequencies in the damage claims are a reflection of what was actually available in the areas affected and thus probably a fair portrayal of the relative importance of the crops and animals in these areas. This is undoubtedly more true for the animals than for the crops, as the depredations occurred at varying seasons and the standing crops were almost only affected by actual troop movements and encampments, while the animals were often obtained by foraging parties who did not affect the standing crops. As the claims are most often not specific as to the exact date or cause of the loss, there is no systematic means of organizing these data separately. One might also question whether or not foragers in different areas had different predilections in terms of what was to be liberated from the New Jersey farmers. Perhaps, but I doubt it.

Another caveat in the use of the data might include the fact that the farmers inflated their claims. This might well be the case, but again presumably they would be claiming for what was known to be in the area at the time the damage was taking place. Also, neighbors, who were men of good repute, had to testify under oath and sign statements that the damages had actually occurred.

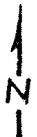
Despite the unfortunate uncertainties surrounding the quantitative accuracy of the damage claims, and the fact that they do not by any stretch of the imagination provide us with a statistically valid sample, they do provide more data on crops and animals than does any other source, including tax lists and wills. Another valuable characteristic is the large number of the claims, representing the losses of 1131 ordinary farmers and the fact that five culturally distinct counties are represented. These counties include heavily Dutch Bergen<sup>(14)</sup> and Somerset, English Burlington, New-England settled Essex, and

# NEW JERSEY

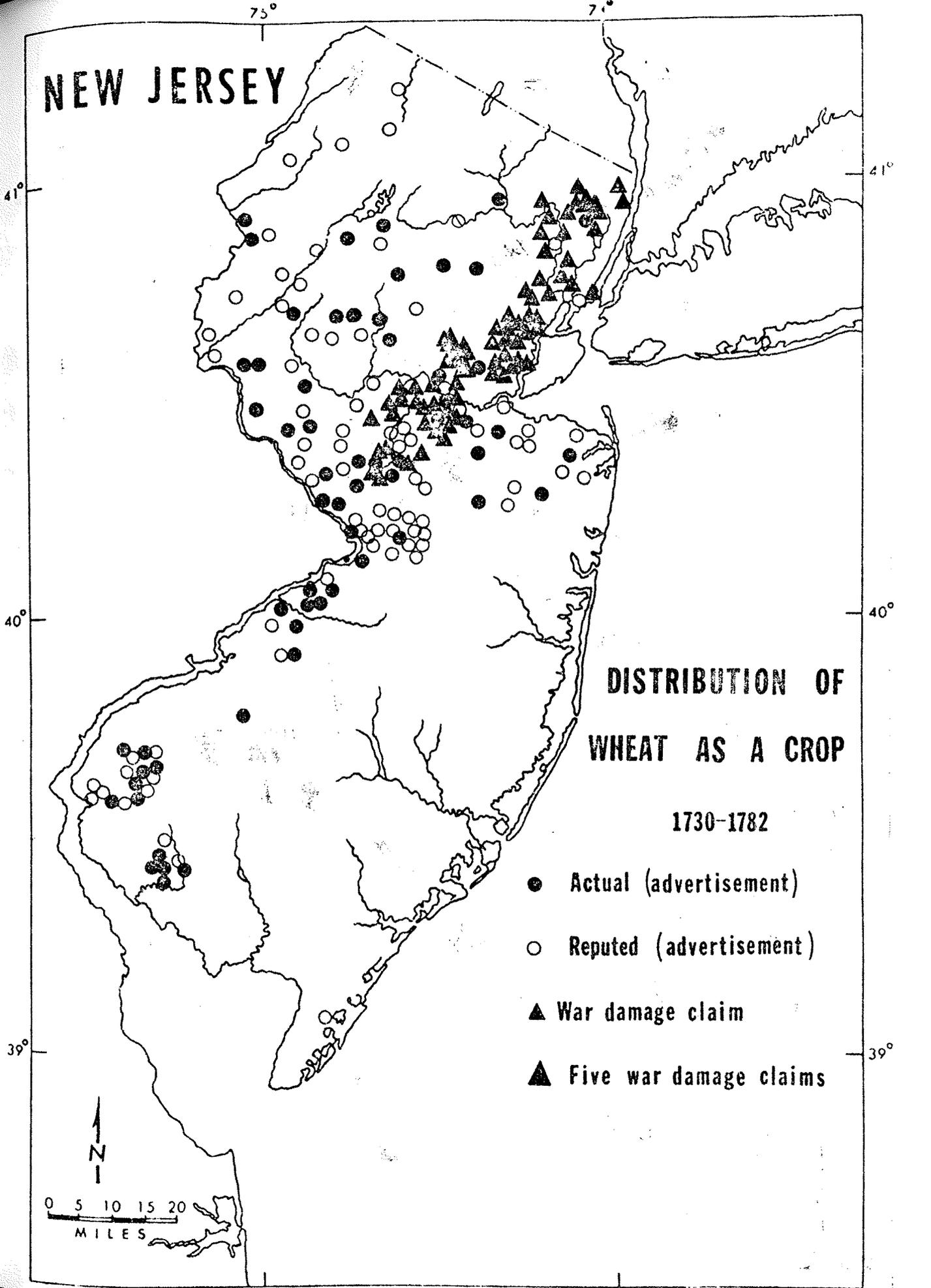
## DISTRIBUTION OF WHEAT AS A CROP

1730-1782

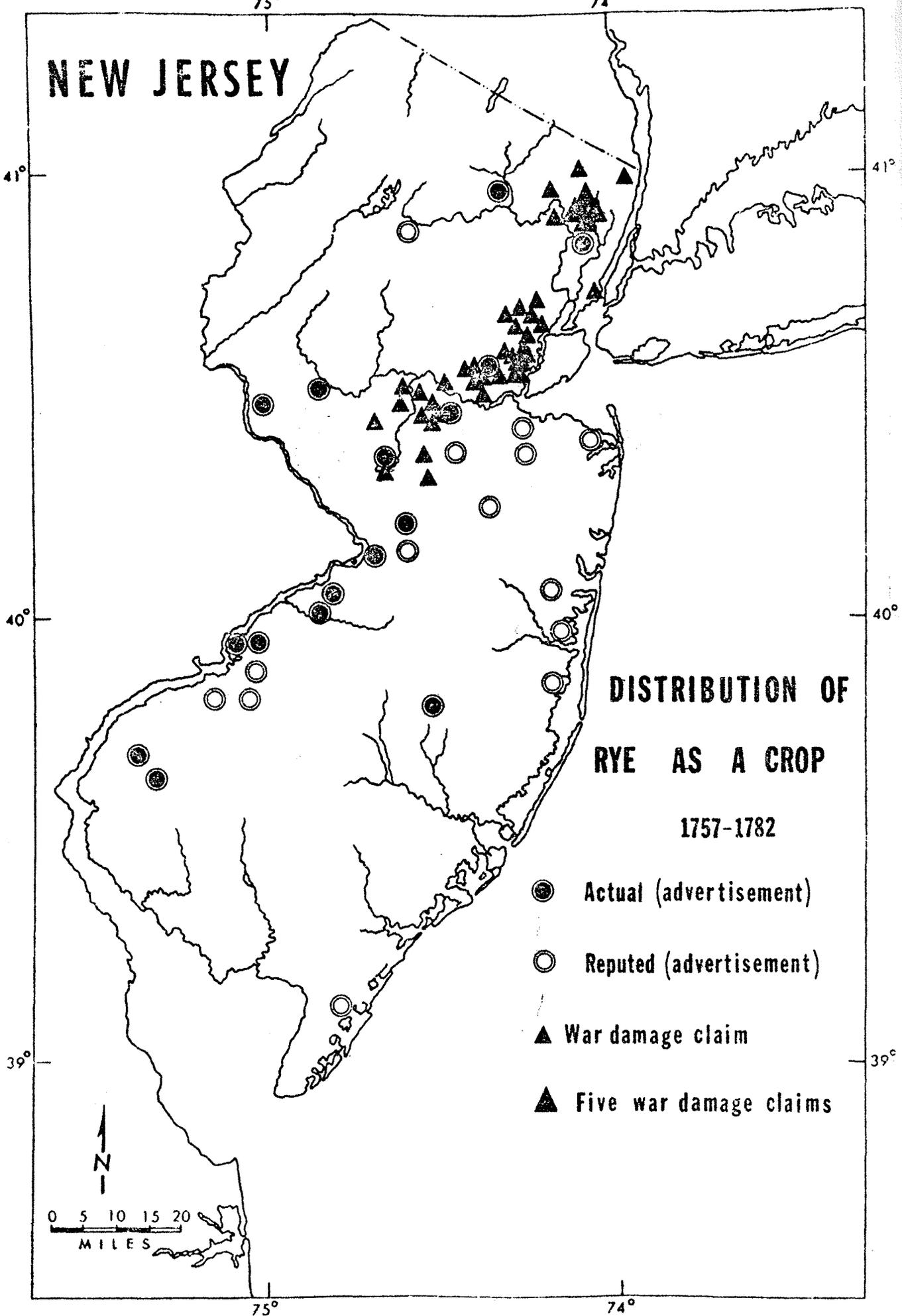
- Actual (advertisement)
- Reputed (advertisement)
- ▲ War damage claim
- ▲ Five war damage claims



0 5 10 15 20  
MILES



# NEW JERSEY

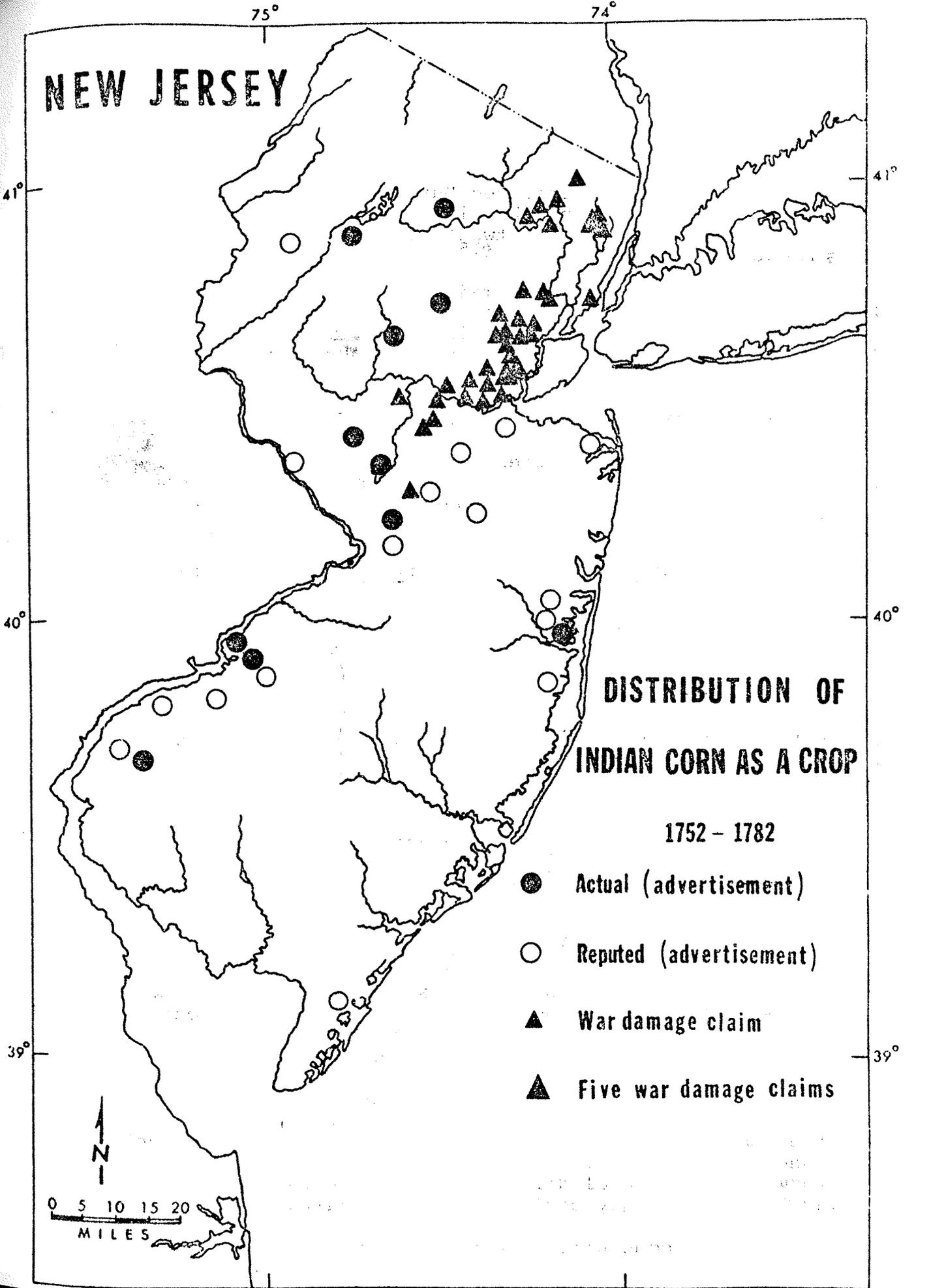


## DISTRIBUTION OF RYE AS A CROP 1757-1782

- Actual (advertisement)
- Reputed (advertisement)
- ▲ War damage claim
- ▲ Five war damage claims

0 5 10 15 20  
MILES

# NEW JERSEY



## DISTRIBUTION OF INDIAN CORN AS A CROP

1752 - 1782

- Actual (advertisement)
- Reputed (advertisement)
- ▲ War damage claim
- ▲ Five war damage claims

0 5 10 15 20  
MILES

Middlesex, which had experienced Dutch, English, New England, and Scottish settlement by the time of the Revolution. The damage claims represent from ten to twenty percent of the ordinary farmers in each of these counties. (15)

The percentage of the major grains (Table 2) reflected in the damage claims are generally in accord with what would be expected with wheat generally being somewhat better represented than rye. The relatively high percentage of maize in Essex, and oats in Bergen are a bit of a surprise, however.

More claims for damages concerning livestock (Table 3) were submitted than for any other farm product. The percentages reflect relatively high percentages of milch cows and cattle in the Dutch-settled areas. These percentages may be compared to the figures for cattle taxed per county which are available for 1784: (16)

<u>County</u>	<u>Cattle taxed per (white) capita</u>
Bergen	.868
Burlington	.645
Essex	.641
Middlesex	.762
Somerset	.849

Again the ratios are substantially higher for the Dutch-settled counties, reinforcing our confidence in the representative nature of the war claims data.

The percentages of oxen are clearly highest in New England-settled Essex and adjoining Middlesex County. Sheep are a bit more important in the New England and English-settled counties, while hogs are well distributed with a maximum in Burlington, an important pork exporter at the time. (17)

Household animals and beehives which rarely if ever are mentioned in wills and tax lists, are well represented in the war damage claims (Table 4). As these were not as marketable as were the major crops and animals, cultural predilections could, presumably, have a major effect on their distribution. The data are disappointing in this regard.

Dunghill, or barnyard fowls were most often mentioned and found in abundance in all the counties. The frequencies for the other claims are disappointing. They vary so widely that one can have little faith in them. If they are, in fact, accurate, vast regional differences in distributions are portrayed which seemingly could hardly have cultural explanations.

One can conclude, I believe, from the maps and frequency

Table 2

Major Grain Crops as Percentages of the Total Number of Claims for Grain  
Destroyed in the Fields  
(War Damage Claims)

County	Number of Claims	Wheat	Rye	Barley	Corn	Oats
Bergen with Acquackanonk Twp. in Essex (Dutch)	60	33.33	31.66	5.0	8.33	21.66
Burlington (English)	78	38.46	39.74	1.28	10.25	10.25
Essex (New England)	40	37.50	17.50	0	30.0	15.0
Middlesex (Heterogeneous)	83	51.80	27.71	0	10.84	9.63
Somerset (Dutch)	37	62.16	21.62	0	5.4	10.81

Table 3

Livestock as Percentages of the Total Number of Claims for All Livestock  
(War Damage Claims)

County	Number of Claims	Milch Cows	Cattle	Oxen	Sheep	Hogs
Bergen with Acquackanonk Twp. in Essex (Dutch)	541	32.71	14.97	3.69	22.92	25.67
Burlington (English)	323	27.55	10.21	4.02	25.38	32.81
Essex (New England)	383	28.19	9.92	8.09	28.98	24.80
Middlesex (Heterogeneous)	629	28.13	15.89	10.01	23.68	22.25
Somerset (Dutch)	237	32.91	19.19	4.64	18.09	24.84

Table 4

Household Animals and Beehives as Percentages of the Total Number of Claims  
for Household Animals and Beehives  
(War Damage Claims)

County	Number of Claims	Dunghill Fowls	Turkeys	Ducks	Geese	Beehives
Bergen with Acquackanonk Twp. in Essex (Dutch)	137	44.43	8.75	7.29	10.88	27.89
Burlington (English)	243	41.56	19.34	11.52	21.81	5.76
Essex (New England)	160	39.37	5.62	.62	33.75	20.62
Middlesex (Heterogeneous)	202	33.66	15.84	6.93	22.77	20.79
Somerset (Dutch)	58	37.93	25.86	6.89	3.44	25.86

distributions presented, that although there may have been some links between cultural background and the production of some crops and animals, most of the major crops and animals were nearly universal in their distribution in the state by the 1780's. The next step, of course, is a lengthy and time consuming analysis of tax lists, wills, and other documentary sources which may in the long run shed a little more light on this problem. Until that time arrives, it seems to me that although the above data exist in relative abundance their representative nature is still open to some question. It is, however, at this point well worth noting that data from both of the sources used above which deal with aspects of the cultural landscape are striking in their confirmation of regional assemblages of structures which are without question directly linked to culture. (18)

FOOTNOTES

- 1 Grateful acknowledgement is due the Rutgers University Research Council for financial support for the research leading to this paper as part of a larger project.
- 2 Adolph B. Benson (ed.), Peter Kalm's Travels in North America (New York: Dover Publications, Inc., 1964), Vol. 1, p. 135; Percy W. Bidwell and John I. Falconer, History of Agriculture in the Northern United States, 1620-1860 (Washington: Carnegie Institution of Washington, 1925), p. 93; and Carl R. Woodward, "Colonial Agriculture of New Jersey," in Krving S. Kull (ed.), New Jersey: A History (New York: The American Historical Society, Inc., 1930), Vol. 1, p. 275.
- 3 James T. Lemon, "The Agricultural Practices of National Groups In Eighteenth-Century Southeastern Pennsylvania," The Geographical Review 56 (October, 1966), 467-496.
- 4 United States Census Bureau, A Century of Population Growth from the First Census of the United States to the Twelfth, 1790-1900 (Washington: Government Printing Office, 1909), pp. 119-121.
- 5 Frederick L. Weis, The Colonial Churches and Colonial Clergy of the Middle and Southeastern Colonies (Lancaster, Massachusetts: Society of the Descendants of the Colonial Clergy, 1938), pp. 19-105.
- 6 Marcus L. Hansen, "The Minor Stocks in the American Population of 1790," Annual Report of the American Historical Association for the Year 1931 (Washington: Government Printing Office, 1932), pp. 366-372.
- 7 Weis, 1939, 19-105.
- 8 Theodora F. Martin, "Quaker Settlement in New Jersey 1665-1800: Origins and Dispersals," unpublished M.A. essay, Rutgers University, 1969, p. 16.
- 9 John Rutherford, "Notes on the State of New Jersey," Proceedings of the New Jersey Historical Society, I (1867), 88.
- 10 William A. Whitehead, et al. (eds.), Archives of the State of New Jersey: Documents Relating to the Colonial, Revolutionary History of the State of New Jersey (First Series, 42 vols.; Various Places: State of New Jersey (1880-1949); and William S. Stryker, et al. (eds.), Archives of the State of New Jersey: Documents Relating to the Revolutionary History of the State of New Jersey (Second Series, 5 vols.; Various Places: State of New Jersey (1901-1917)).

- 11 New Jersey, Division of State Library, Bureau of Archives and History, "Damages by the British in New Jersey, 1776-1782," 5 vols.
- 12 Properties advertised with grain crops in the ground were recorded as "actual," those whose owners claimed that the land produced specific grains were recorded as "reputed."
- 13 Harold F. Wilson, The Jersey Shore: A Social and Economic History of the Counties of Atlantic, Cape May, Monmouth and Ocean (New York: Lewis Historical Publishing Company, Inc., 1953), Vol. I, p. 134.
- 14 The data for Acquackanonk Township in Essex County have been included with those for Bergen County because of Acquackanonk's heavy Dutch population, amply revealed in the war damage claims. Acquackanonk was located in northern Essex County, bordering Bergen County.
- 15 This is calculated by assuming that the population was almost entirely involved in agriculture at that time and farm families were made up of from five to seven individuals. The number of white inhabitants estimated for the relevant counties in 1784 was then divided by six, and the claims per county calculated as a percentage of the assumed number of farm families. The 1784 statistics are found in "An Estimate of the Ratables in the State of New Jersey," Votes And Proceedings of the General Assembly of the State of New Jersey (Trenton: Isaac Collins, 1784), p. 33.
- 16 Loc. cit.
- 17 Samuel Smith, The History of the Colony of Nova-Caesaria or New-Jersey (2nd edit.; Trenton: William S. Sharp, 1877), p. 496.
- 18 Peter O. Wacker, "Folk Architecture as an Indicator of Culture Areas and Cultural Diffusion: Dutch Barns and Barracks in New Jersey," American Folklife (in press).

PROBLEMS OF THE NEW YORK METROPOLITAN REGION  
AS PERCEIVED BY RESIDENTS OF  
NORTHERN NEW JERSEY

by

Robert Brown  
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In planning a class project in political geography in the spring of 1970, the instructor and his eighteen students agreed that it would be interesting to develop and distribute a questionnaire which would test regional attitudes of residents of Northern New Jersey. The original emphasis was heavily political, as shown in this suggested hypothesis by Dennis Young, a political science major: "That the fragmentation of political responsibility and lack of regional consciousness among the people in the New York Metropolitan Area have made the laws governing that area incapable of coping with present regional problems." As the questionnaire was evaluated, it became apparent that the original aim was a little ambitious, and the focus was shifted to the perception of regional consciousness and regional problems, with secondary attention to the question of identifying solutions to the problems. This paper will explain the methodology pursued in the class project, evaluate the results achieved with an admittedly inadequate sample, and suggest future directions for research on this kind of problem.

Design

In view of the fact that this was to be a project with a high degree of student involvement, the questionnaire represented an amalgamation of contributions, though the instructor's biases were ultimately dominant. Students were first asked to articulate an hypothesis, then to suggest questions which should necessarily be included. After an initial synthesis by the instructor, student committees assembled the various sections of the questionnaire, which resulted in a rough draft that was mimeographed and tested on friendly subjects. Weaknesses uncovered in this process were discussed in a long class session, and the final document eventually emerged, consisting of four legal-size pages with many complex questions. No attempt was made to design the questionnaire for computer analysis, but some questions required the subject to scale his responses.

Briefly, the content was as follows:

1) a general information section, including such matters as income bracket, age, occupation, political affiliation, and

newspapers read regularly;

2) a section testing the respondent's perception of the size of the New York Metropolitan Region (hereinafter referred to as the Region) by selecting one of a series of concentric circles drawn on a map of Northern New Jersey (see Figure 2) and by indicating whether he considered that his home community lay within the Region and/or in the Newark Metropolitan Area;

3) a series of questions about the frequency with which the respondent went to Newark and to New York City, the means of transportation utilized, and the reasons for such excursions, intending to measure the subject's circulation in the Region;

4) a list of twenty-two important problems of the Region, grouped as shown in Table 1, with a choice among the following five statements to be applied to each problem:

- a) This is a critical problem in the New York Metropolitan Region and in my community; current efforts toward solution appear to be inadequate.
- b) Although this is not an important problem in my community, it is a critical problem in the Region; current efforts toward solution appear to be inadequate.
- c) This is an important problem in the region, but I think it is being adequately handled.
- d) I consider this problem unimportant.
- e) I have no opinion.

The respondents were also asked to list the five problems considered most critical in approximate order of priority;

5) a brief question on attitudes about taxes paid to different levels of government;

6) a difficult question asking about possible solutions to the five problems selected as most critical, with the following choices provided (somewhat abridged):

- a) Better personnel in government, change in priorities, more tax money spent at home - in short, re-ordering without restructuring.
- b) More direct cooperation among communities, as in the case of a co-operative school district.

TABLE I

REGIONAL PROBLEMS LISTED ON THE QUESTIONNAIRE

1. Education
  - a. quality of primary and secondary schools
  - b. development of community colleges
  - c. quality of colleges and universities
  
2. Environment
  - a. air pollution
  - b. water pollution and sewage disposal
  - c. solid waste disposal (garbage, abandoned cars, litter)
  - d. noise
  
3. Housing
  - a. scarcity of low and middle income housing
  - b. racial conflict in housing
  
4. Social
  - a. organized crime
  - b. crime in general
  - c. drugs
  - d. dissident youth
  - e. relation of policy to community
  
5. Standard of Living
  - a. unemployment
  - b. discrimination in jobs
  - c. welfare system
  - d. rising cost of living
  
6. Transportation
  - a. bus service
  - b. commuter railroads
  - c. auto. traffic and parking
  - d. airport facilities
  
7. Other Problems (specify)
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_

- c) Increased direct intervention from federal and/or state governments.
- d) Strengthened authority at the community level - more "home rule".
- e) Strengthened authority at the county level, at the expense of community, city and/or state.
- f) Creation of a new government at the regional level, also at the expense of community, city and/or state.
- g) No opinion.
- h) Other approach to be specified by the respondent.

### Distribution

Being realistic about the time allotted for distribution and about the complexity of the questionnaire, the participants reached a consensus that it would not be possible to distribute it in a scientific manner. Most of the students lived in suburban communities, ranging from Upper Saddle River in Bergen County to Piscataway in Middlesex; the urban centers of Newark, Jersey City and Paterson were also represented. It was possible, therefore, to get a reasonable geographic coverage of the Region in New Jersey if each student operated within his own community. The aim was to achieve a high percentage of returns rather than a highly scientific pattern of distribution.

Forty questionnaires were assigned to each student, sixteen of whom were participating at this stage. Interviews were to be attempted, but the chief method of rapid distribution was through the schools, with teachers, administrators or parents of pupils serving as respondents. Accordingly, a bias toward persons in the academic world was anticipated. An effort was also made to contact persons in various levels of government, particularly the municipal, in order to attempt to determine whether their views differed significantly from those not holding positions of authority.

Many problems were encountered in distribution. A few schools proved to be peculiarly uncooperative, with permission to distribute withheld or delayed for no apparent reason. One student found himself with a collection of questionnaires answered by high school seniors - the results, as might be anticipated, were catastrophic. Other students found themselves helping respondents to answer the questionnaire during interviews, a procedure which led to discarding a number

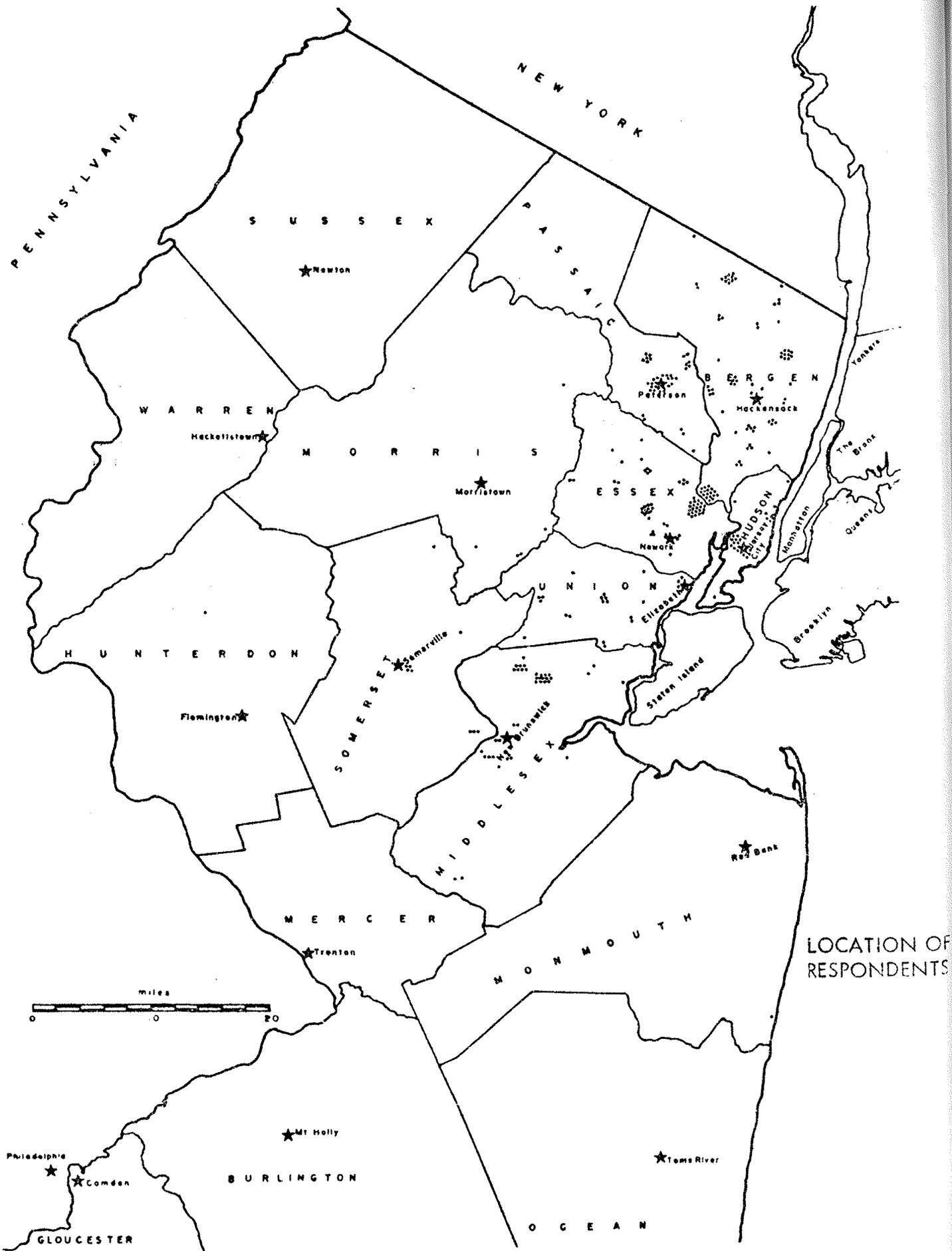
of potentially valuable responses. One or two members of the class did, in fact, interview themselves a little too obviously; and one Spanish-speaking member, who had promised to reach a Spanish-speaking neighborhood in Newark, never made it into the field.

As was anticipated, some respondents found the questions confusing or difficult and rejected the sheet in whole or in part. But 273 apparently reliable questionnaires were returned, a number large enough to permit some interesting patterns to emerge in the evaluation.

### Evaluation

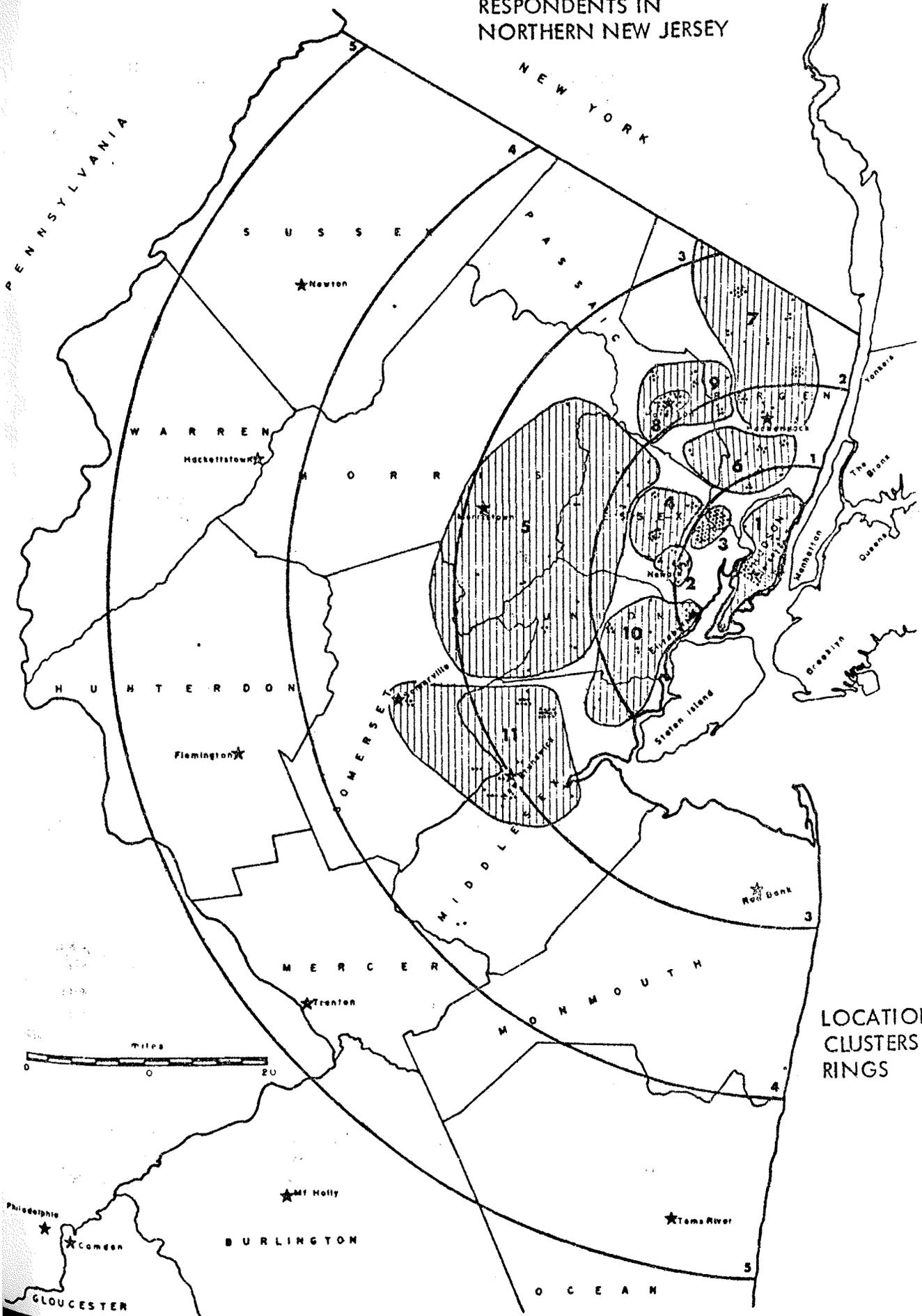
As a preliminary step in evaluation, each student was asked to comment on the project and to make observations on the results compiled from his own sample. The general consensus was one of satisfaction with the project, but a number of specific flaws were exposed. Chief among these were the length and complexity of the questionnaire, which clearly limited acceptance by the respondents. No student was willing, however, to suggest exactly how the questionnaire might have been shortened, although several commented that simple "yes-no" questions should have been employed. Another flaw mentioned was the timing of the distribution, which coincided closely with the Earth Day observance and may have temporarily heightened awareness of environmental problems. Some students were surprised by the narrow horizons of their subjects. A majority of respondents from East Orange, for example, stated that their community did not fall within the Region, although some of these contradicted themselves by selecting Ring 3 as the periphery of the Region, thereby including East Orange. As might be anticipated, the students who were most conscientious in doing legwork to distribute questionnaires got the highest percentage of returns and made the most significant observations on the project.

After the group participation phase of the experiment was completed, the instructor and Robert Gerdes, a geography major skilled in computer programing, continued the evaluation during the summer of 1970. The first step was to analyze the sample obtained and to plot the distribution of respondents, as shown in Figure I. The map quickly reveals many gaps in location, most striking of which is the sparsity of residents (nine) contacted within the city of Newark. Neither was the sample a representative social or economic cross-section. In view of the fact that the students who went into the field were all white and generally middle class, it is not surprising that only nine respondents were clearly identified as Black or Puerto Rican, that only 9 per cent were in blue collar jobs, and that the mean family income was close to \$11,000. The expected academic



LOCATION OF RESPONDENTS

# RESPONDENTS IN NORTHERN NEW JERSEY



LOCATION IN CLUSTERS AND RINGS

bias was strong; 27 per cent were students, teachers, or school administrators. The effort to reach government employees resulted in 16 per cent of the sample falling into that category, while of the remainder 12 per cent were professional and 30 per cent were in white collar occupations not already classified. The New York Times was the most widely read newspaper among the sample population with 37 per cent listing it; following were the Newark News with 33 per cent and the New York Daily News and the Newark Star Ledger each with 22 per cent. Newspapers were the major source of news in the sample, outpolling television and radio by 67 to 57 to 41 per cent, respectively.<sup>(1)</sup> The sample was composed of politically active as well as literate people; 86 per cent had voted in a recent election on either national, state or local level. Democrats outnumbered Republicans 33 per cent to 26 per cent, but a surprising 41 per cent stated that they were independent or members of splinter parties.

In sum, the unscientific sampling process and the complex questionnaire combined to furnish a respondent population which was predominantly white middle class suburban, relatively well read and politically active, with a strong academic bias. Such a group should be relatively alert to the problems of the Region and of individual communities.

### A Geography of Problem Perception

The awareness of problems among our respondents was indeed high; only two items from the list of twenty-two, namely bus service and discrimination in jobs, were not considered critical by the majority of the sample population. The perception of the problems varied with the location of the respondents, and a method was devised to examine these variations. All persons who cited a problem as critical by applying one of the first two options (statements 4a and 4b on page 3) were evidently keenly aware of the existence of the problem. Another level of perception could be tapped by examining the ratio of "critical in community and in Region" responses to "critical in Region but not in community" responses; the ratio of the former to the latter in any one subgroup of the sample could be considered a "penetration index" of the problem into that group. If, for example, half selected the first option and half the second, the index would be infinity. Note, however, that persons who selected the third, fourth or fifth options were not being counted by this method, the presumption being that their relative lack of concern would make them poor judges as to whether the problem penetrated into the group.

In order to test the variation in the penetration index, the sample was divided into subgroups defined by income, occupation, newspaper readership, primary source of news, residential zones

CHARACTERISTICS OF THE RESIDENTIAL CLUSTERS

Cluster No.	Communities in Sample	No. Resp. in each	Income (avg.)	Newspapers	Circulation	Tax Base	Tax Rate	Pol. Affil.
1 (East Hudson)	Jersey City	13	Low	New York and local	More to N.Y.C. than to Nwk., but index relatively low	Industry, commercial, apts. in all communities; densely populated urban environment	Very high	I 9
	Hoboken	2						D 6
	Others	5						R 4
	Total	20						
2	Newark	9	Low	Newark primarily	To N.Y.C. for entertainment only	Commercial very high, with indus., apts. also	High-est of all clusters	I 4 D 3 R 1
3 (West Hudson - South Bergen)	Harrison	20	Above avg., esp. N. Arl.	Newark & local	To N.Y.C. for entertainment; to Newark for other services, but index low	Commercial and industrial high; residential and indus. uses separated	Lowest of all clusters	D 27
	N. Arlington	14						R 8
	Kearny	4						I 6
	E. Newark	1						
	Total	39						
4 (Essex Inner Ring)	E. Orange	12	Avg.	Newark & N.Y.C.	To N.Y.C. for entertainment, Nwk. for shopping; index low	Residential high, but com., apts. significant	High esp. East Orange	I 9
	Belleville	4						D 7
	Bloomfield	4						R 4
	Total	20						
5 (Essex-Morris-Union-Somerset Outer Ring)	Scotch Plains	3	High	Newark News, <u>New York Times</u>	High index of circulation, with marked preference for N.Y.C. on everything but education	Mainly residential	Moderate to high	I 7
	Livingston	2						R 5
	New Prov.	2						D 4
	West Orange	2						(3
	Westfield	2						rejects)
	Others	8						
	Total	19						

106

TABLE 2 (Cont.)

6	Lodi	5	Avg.	Bergen	More to N.Y.C.	Industrial	Low	D 7
(South	Rutherford	3		<u>Record</u> ,	than to Newark,	high, signif.		R 5
Bergen-	Woodridge	3		New York	index moderate	commercial;		I 4
Passaic)	Others	6		papers		residential		(1
	Total	<u>17</u>				located on		reject)
						ridge		
7	New Milford	10	High	Bergen Record,	Entertain-	Primarily	Mod-	I 21
(North	Upper Saddle			New York	ment in N.Y.C.	residential,	er-	R 10
Bergen)	River	10		papers	primarily,	commercial	ate	D 9
	Saddle Brook	4			rel. low index	or indust-		(3
	Ridgewood	3				rial in a		reject)
	Park Ridge	3				few		
	Teaneck	2				communities		
	Westwood	2						
	Allendale	2						
	Others	7						
	Total	<u>43</u>						
8	Paterson	18	Low-	Local pa-	Entertainment	Industrial,	High	R 7
			est	pers, <u>News</u>	and shopping	Commercial,		D 3
			of all	<u>Daily</u>	to N.Y.C., very	decayed		I 8
			clus-		low index	residential		
			ters					
9	Wayne	6	Avg.	Local pa-	Entertainment	Mainly res-	Low	I 9
(Subur-	E. Paterson	5		pers, <u>Daily</u>	in N.Y.C., very	idential, in-		R 8
ban Pat-	Haledon &			<u>News</u>	low index	dust. or		D 3
erson)	N. Haledon	4				commercial		
	Hawthorne	2				in some com-		
	Little Falls	2				munities (esp.		
	Fair Lawn	1				Wayne)		
	Total	<u>20</u>						
10	Cranford	5	Be-	Elizabeth	Newark and N.Y.	Heavy indus-	Low	I 8
(Union	Elizabeth	3	low	<u>Journal</u> ,	C. about equal	trial, (esp. to		D 3
Core)	Linden	2	Avg.	<u>Newark Ledger</u> ,	for all services	oil refining	Mod-	R 1
	Rahway	2		<u>Daily News</u>	ex. entertain-	in Linden)	er-	(6
	Others	6			ment; low index		rat	reject
	Total	<u>18</u>						

TABLE 2 (Cont.)

11	Metuchen	13	Highest	New York	To N.Y.C. for	Mainly resi-	Moderate	I-20
	Piscataway	7	of all	<u>Times</u> & local	variety of	dential, in-		D- 9
(Middlesex-	Somerville	4	clusters	papers	services, little	dustrial or		R- 8
Somerset)	E. Brunswick	3			to Newark; index	commercial in		(2
	Somerset	3			fairly high	some commun-		reject)
	New Bruns-	2				ties		
	wick							
	Highland Pk.	2						
	Others	5						
	Total	39						

delimited by the rings on Figure 2, and finally by residential clusters of similar communities as shown also on Figure 2. The variation was much the greatest with the last-mentioned parameters, a result which encouraged the researchers to draw a series of isoline maps of problem penetration with the twelve residential clusters as districts.

Table 2 gives relevant data for each of the clusters. Clusters 1, 2 and 8 represent primarily urban centers; Clusters 3, 4, 6 and 10 chiefly inner suburban communities; and Clusters 5, 7 and 11 are outer ring suburbs, mainly residential in character. Groupings were made according to data furnished on the questionnaires, according to municipal statistics available, and according to the general knowledge of the research team. With a more scientifically determined sample, a more scientific definition of the clusters would be appropriate.

Figure 3 is a highly generalized map of the income surface of the clusters. While the slope shows income increasing with distance from New York City, there are two striking anomalies - the depression in Paterson and the slight peak in Cluster 3, which includes communities which are sometimes referred to as "the Peninsula" because they are bounded by the Jersey Meadows on the East and the Passaic River on the West. These two features appear in reverse on many of the maps of problem perception.

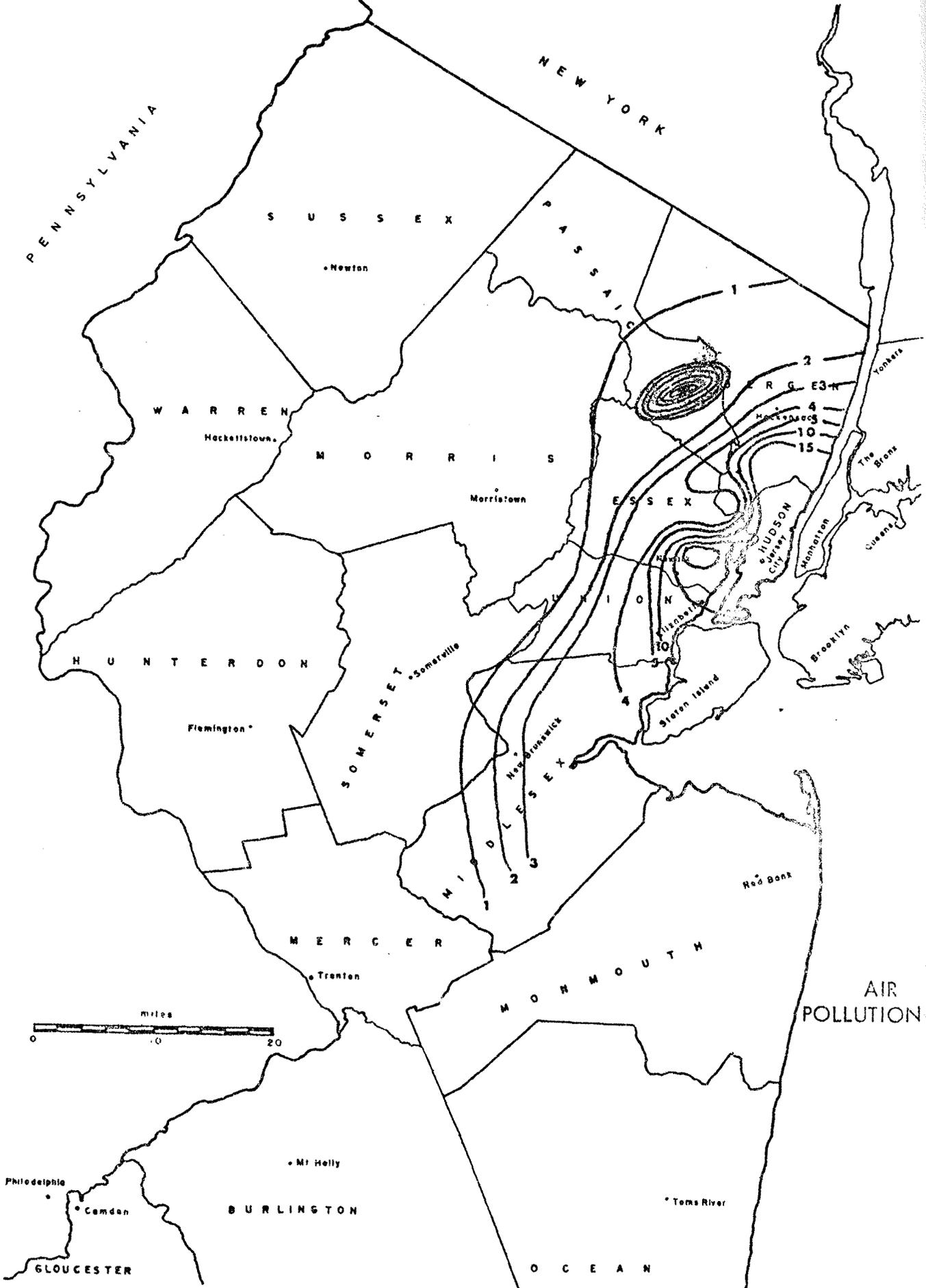
#### Analysis of the Maps and Responses on Problems

The maps of penetration indexes, while drawn from only eleven data points representing the approximate centers of gravity of the residences of respondents in each cluster, show a considerable variation in patterns of isolines. Note that, for purpose of clarification, the isoline interval on all maps has been set at one for index values between one and five, then raised to five for index values above five. Some of the very high peaks actually represent an index of infinity, indicating that all respondents who recognized the problem as critical felt that it penetrated into the community as well as the Region. A brief analysis of each of the maps and problems follows, with the ten outstanding problems ranked in order of respondents' citing them as critical.

Figure 4. Air Pollution. (Average Penetration Index 3.2%  
responding critical, 89)

While first in number of critical responses, air pollution was only third in penetration, though indices of more than 15 were recorded in Clusters 1, 2, 6 and 8. Clusters 10 and especially 3 were surprisingly low in penetration; respondents here behaved more like inhabitants of residential than industrial suburbs. The indicated "valley" between "Mount Paterson" and the





AIR POLLUTION

"hills" of South Bergen is hypothesized from lack of data; it may be that a sloping ridge exists from Mount Paterson eastward, as heavy vehicular traffic and some industry are characteristic of the area.

Among employment groups, blue collar workers were significantly lower than all others in perceiving the problem as critical, in spite of the fact that the penetration index of air pollution into blue-collar residential areas was highest of all groups. This seeming anomaly might be explained by the industrial worker's acclimatization to dirty air. Since the penetration index was determined only from those respondents who perceived the problem as critical, it is apparent why this value should be recorded as high in the blue collar residential areas.

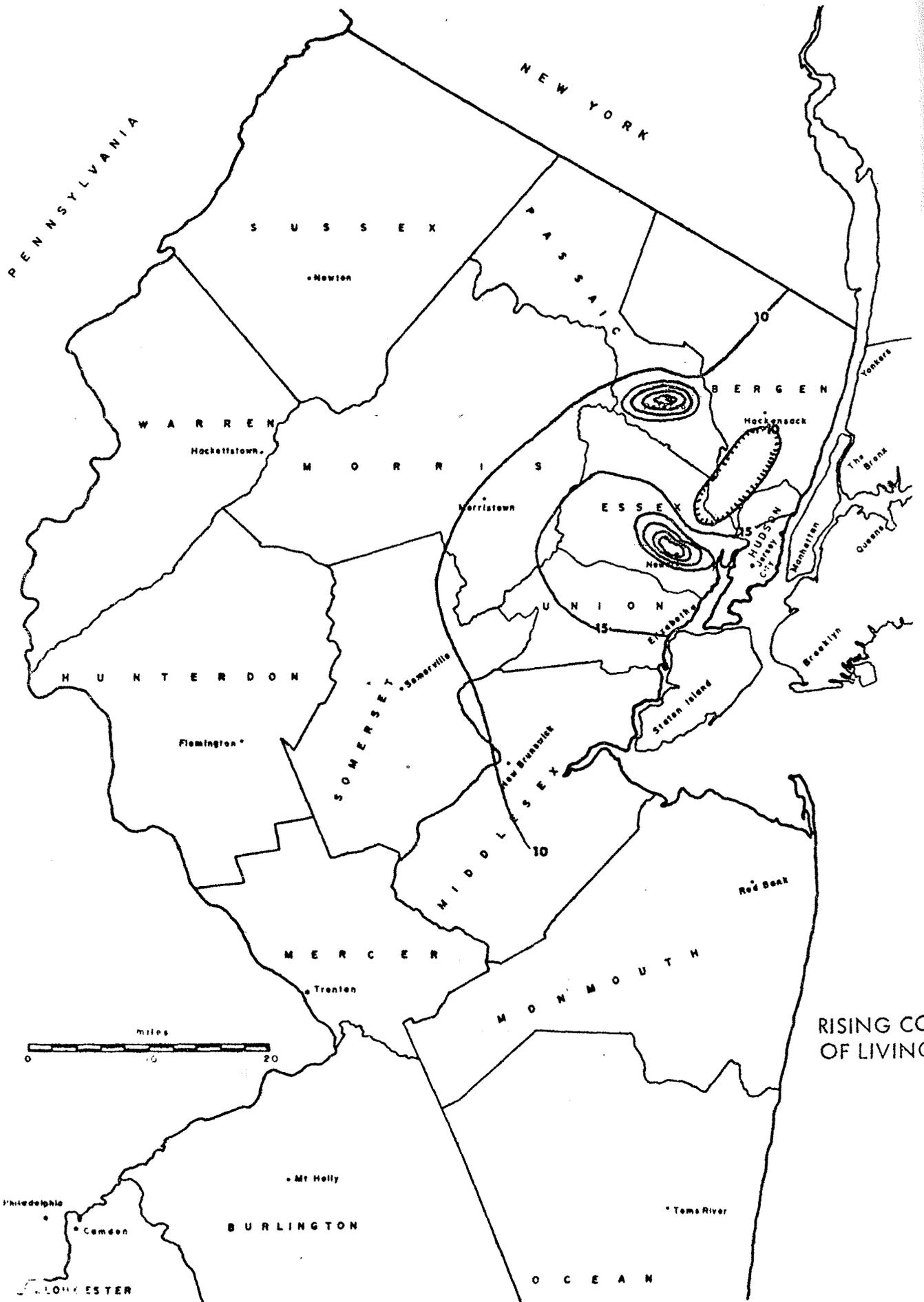
As was true of many of the problems, a majority of respondents felt that air pollution should be solved by intervention from government on the state or federal level. The option of the regional solution was cited by 13 per cent, however, indicating higher than average acceptance of this alternative for this problem as compared with the others.

Figure 5. Rising Cost of Living. (P.I. 12.8, 86% critical)

The penetration index for this problem was in a class by itself, necessitating the use of the 10 isoline as the lowest value plotted on the map. When asked to rank the five most critical problems in order of priority, however, the rising cost of living came out fourth rather than second, indicating, perhaps, a certain resignation of the individual before the inexorable pressures of inflation.

The pattern in this case has certain similarities to the air pollution map, but Mount Newark has stretched westward to incorporate the inner suburbs in Cluster 4, among which East Orange has property tax rates only slightly less overwhelming than Newark's.<sup>(2)</sup> Cluster 6 shifts from a high to a low on this map and joins with Cluster 3 to form a prominent depression, a feature which coincides with the lowest property tax rates of all groups of communities herein recorded. Lest the influence of the property tax rate on penetration of this problem be given too much weight, it should be noted that the very high tax rates in East Hudson did not yield a commensurate penetration index, while Mount Paterson coincides with a relatively moderate rate for urban areas. It might be fair to postulate, however, from the limited evidence seen here, that the penetration of the problem into single-family residential areas should correlate positively with the property tax rate.

It is interesting that high income respondents and pro-



RISING COST OF LIVING

fessional people (between which groups there is, of course, a considerable overlap) had the highest penetration indexes, that penetration among New York Daily News readers was significantly higher than among readers of other newspapers (can that be explained?), and that government employees were lowest in the perception of the problem as critical.

In the case of this problem 64 per cent of respondents felt that a re-ordering of priorities (option a, page 3) was sufficient action to achieve a solution, with some persons specifically mentioning the Vietnam War as the most flagrant misallocation of funds. It should be noted that inflation more than any other problem on the list is national in character, so that its high penetration index and the response on solutions do not have particular significance at the regional level.

Figure 6. Water Pollution (P.I. 3.2, 84% critical)

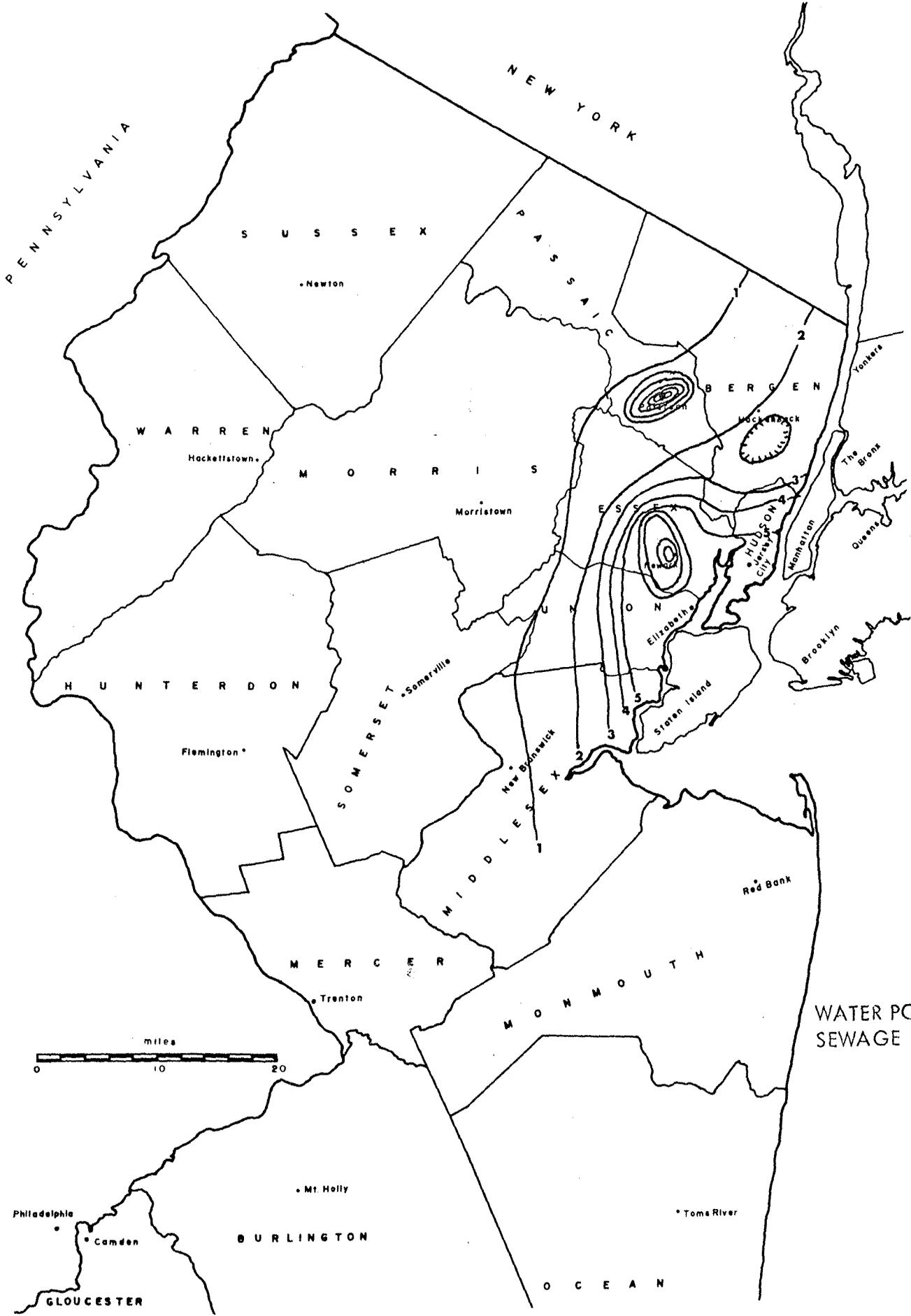
This problem's penetration index pattern resembles that for air pollution, although the peaks are somewhat lower and the depression shifts, for some reason, from Cluster 3 to Cluster 6. The 1 isoline corresponds closely with the periphery of the respondents, and, as with many other problems, the pattern clearly indicates spatial association with urban (though not necessarily industrial) development.

Perception of this problem as critical rose with the income level, while academic groups were especially high, blue collar especially low. Wall Street Journal readers, however, had a low penetration index of less than one. In regard to solutions, almost 50 per cent opted for intervention from federal and/or state governments.

Figure 7. Drugs (P.I. 3.7, 83% critical)

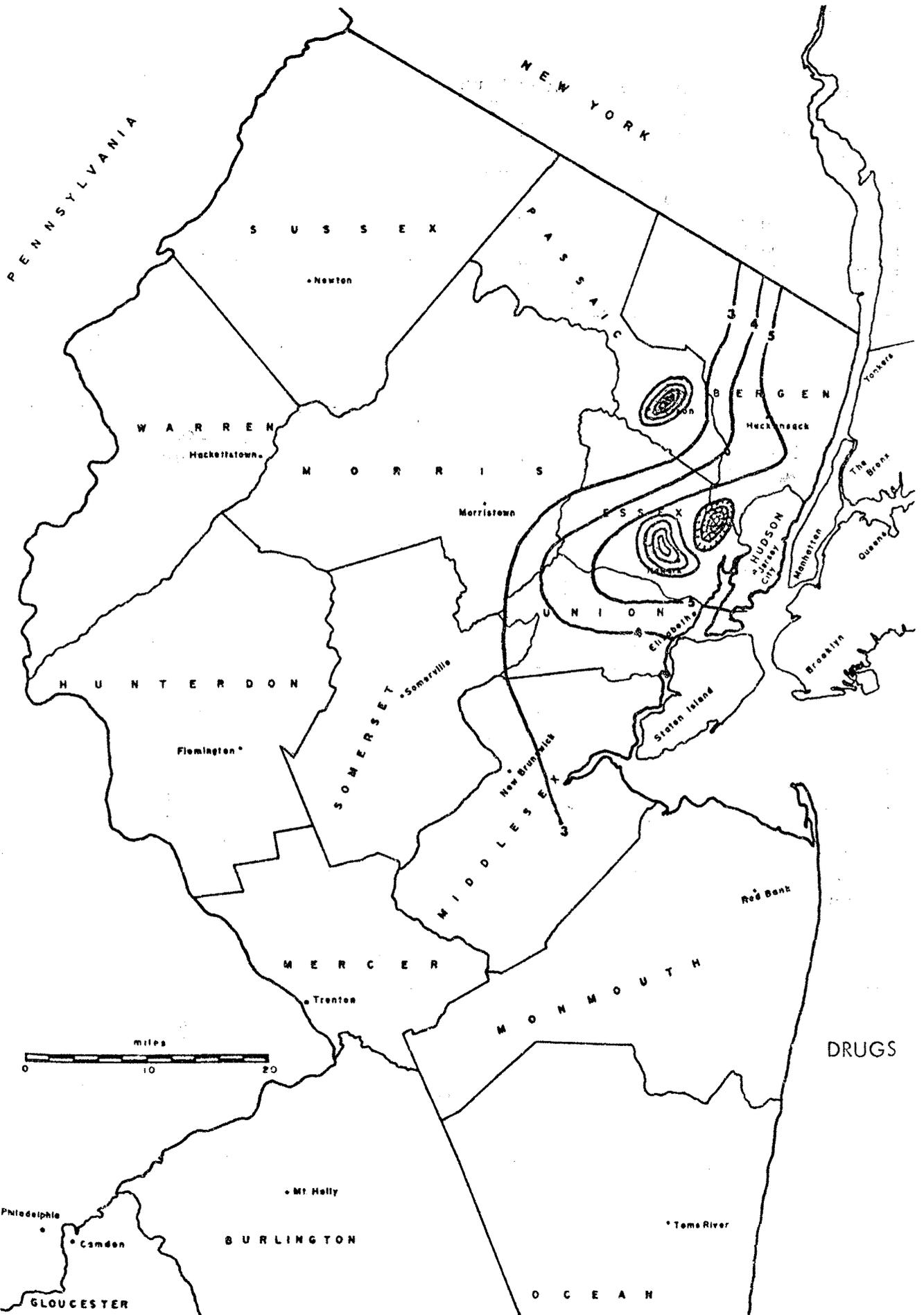
While ranked fourth according to percent of respondents' citing as critical, the drug problem was second in the average penetration index and second in the priority ranking of the five most critical problems. Penetration was unusually high into the peripheral suburbs, a pattern reflected also in the fact that high income groups recorded a higher penetration index than mid-income groups (though low income groups were the highest, as might be anticipated). Among employment groups, penetration was most profound among the partially employed and also high in blue collar areas, while government employees recorded relatively low penetration.

The most curious feature on this map is the striking depression in Cluster 3. Previous and subsequent maps also show irregular behavior from our comparatively large sample of the



WATER POLLUTION  
SEWAGE DISPOSAL





DRUGS

inhabitants of the "peninsula" that stretches between the meadows and the Passaic River. The penetration index was 3.3 into the suburban, relatively high-income sample from North Arlington, but it was only one among the average-income sample from Harrison and Kearny. With regard to drugs, inquiries have indicated that a real problem exists in the latter communities, in spite of the apparent unwillingness of many residents to admit its importance. Local officials in this area, which is filled with identifiable European ethnic groups and notably sparse with Blacks, confirm that the residents are indeed generally blind when it comes to recognition of local problems, though they are aware of the critical problems on the regional level. Further research may yield some more significant data on these interesting communities. (3)

In respect to finding solutions to the drug problem, 40 per cent felt that the intervention was needed from higher levels of government. But 24 per cent opted for strengthened home rule, the highest percentage among the ten top problems directed toward this alternative.

Figures 8 and 9. Crime in General and Organized Crime (P.I. 1.3 and 1.2 respectively, and 79 per cent critical for both)

The patterns of peaks and depressions (note Cluster 3) for both types of crime are similar, but organized crime penetrates fairly deeply into Hudson County, while crime in general has a relatively high index in Bergen County and a surprisingly low index in Jersey City and its neighboring communities. It is apparent, in fact, that our Newark and our East Hudson sample populations perceive regional problems very differently. In view of the very small size of the samples, one must not draw hasty conclusions; but Hudson County residents do have the reputation of being relatively apathetic toward local problems and community involvement, whereas the vitality of Newark has often been demonstrated, most recently in the election of Kenneth Gibson as Mayor.

Penetration indexes among employment groups and income groups produced no noteworthy patterns, but government employees were once again significantly lower in perceiving the problems, particularly organized crime, as critical. The recommended solutions fell into the mean distribution pattern of alternatives for all problems, except that a larger than average proportion (50 per cent) felt that federal or state intervention was needed to deal effectively with organized crime.

Figure 10. Solid Waste Disposal (P.I. 1.4, 78% critical)