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Values, Trees And The Urban Realm

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> And so put off the weary day
> When we should have to put our mind
> On how to crowd but still be kind
>
> from "*America Is Hard to See*"
> by Robert Frost

Not so long ago the word city conjured up such sparkling visions of a new life in sophisticated surroundings that the problem seemed to be, "How you going to keep 'em down on the farm?" Of course the answer was, "You can't", and in the United States only one in ten now lives by working the land. Most of the rest have so crowded into core cities and their suburban areas that names like urban sprawl and megalopolis are almost as freighted with disagreeable meanings as slum and ghetto. Although over three-quarters of our people have found out how to exist in and around cities, they have made so little progress toward doing it in a way that is really kind to their fellows or to the environment, that solving this dilemma comes high on everyone's action list for the 70's. We can hope that this meeting will show how thoughtful use of trees and forests can help ameliorate the life of the great, and not so silent, urban majority.

Most of our speakers have been exploring, and defining whenever they could, some physical nexus between trees and men. At this early stage of "urban forestry" a great deal of this sort of thinking must be done to work out how trees are related to man's natural and cultural environment. We have heard that trees have great aesthetic appeal, that they play a role in maintaining the quality of the air we breathe, tend to suppress noise, have an impact on the hydrologic cycle, create microclimates and wildlife habitats, enrich and stabilize the soil and furnish wood products. On the other hand, they can also mask attractive views, prize up pavements, clog water and sewer lines, routinely interfere with overhead wires and seriously interrupt communication and power transmission during storms, become a fire hazard, endanger motorists, require considerable maintenance around houses and along streets, and transpire a good deal of scarce water. Like most natural objects, trees do some things that people like and others that pester them, so a certain amount of ingenious action is needed to keep a favorable balance between attractions and misfits. It is my job today to enquire whether a value and exchange system exists, or can be created, to perform this trick efficiently.

Discussing values before we fully understand the ecology of trees and men may seem to approach urban forestry backwards. However, people are deciding what to do with woodland everyday in response not only to their knowledge of how forests behave, but also to the values generated by our social machinery. They act as though man and nature

were both part of one great integrated system with closely articulated rules, ignoring the fact that most academics choose to think otherwise. If we wish to improve land usage it seems advisable to study simultaneously the workings of natural systems and the social institutions that have grown up around them. While others deal with nature I shall emphasize the human factors in the man/forest equation. Over the years a number of value and allocation systems have been developed to stimulate the use of scarce resources in ways that efficiently supply the things people need, so a brief review of these mores may suggest what is needed for the future.

Early Land-Use Guides

Because we are meeting here it seems appropriate to use Massachusetts as an example of the man/forest relationships that typify the situation in megalopolis. Actually this state is now 65 percent forested, somewhat more than the 50 percent found in the Boston to Washington corridor that is the eastern flank of urban America. Back when the Indians ruled the land Massachusetts, except for the meadows and marshes, was almost totally covered by forest. Because woodland inflammability and hurricane tracks have changed little since that time it is likely that a patchwork of age classes existed, determined largely by the special fire and storm history of each small area. Also genotypes and sites are rather stable so the same species probably grew in the kinds of places we now find them. In spite of folklore about the forest primeval it is likely that the wooded landscape the colonist faced was much more like our present forest than it was different.

Unmodified woodland in these latitudes is an uncomfortable and almost impossible place to live without shelter, and there is so little food on an acre that even the Indians found some agriculture desirable. Therefore modifying the environment by building houses and barns, clearing land and planting crops was the colonists' first task right along with providing for the common defense and propagating the church. With a scarcity of equipment and not much labor a group effort was in order so the founding fathers rather quickly invented a social system to settle the countryside.The method of granting a township jointly to a responsible group that would "plant themselves thereon" proved very effective. Although the land was initially owned in common, after a few abortive attempts to farm common fields, land was quickly parceled out to individuals. Self-contained farmsteads worked so well that during the first 80 years the seaboard lowland, the Connecticut Valley and much of the Bay Path was solidly settled (Map I). During the next 100 years the balance of the state was taken up so that by 1801 the last towns were granted (Map II).

We can visualize that during this period the population was rather evenly buttered out over the landscape with 30 to 50 people per square mile. Of course, there were somewhat greater concentrations along the seaboard in shipping towns and other trading centers, but most families lived on farms. These farms were not very large because overland trade was minimal, and the majority of people lived a subsistance existence. But this changed rapidly early in the 19th century as the industrial revolution started urbanization in the waterpower towns, roads were built and commercial farming became possible. In response to the prodding of higher produce prices, land was cleared rapidly and by the middle of the 1800's the forest was pushed back to cover perhaps a quarter of the state.

During the Turnpike Era the crying need for improved roads was filled by adapting the government chartered company as a mechanism that could mobilize private funds and initiative to the task. The idea of a publicly regulated monopoly had a brief fling also with canals, but neither of these enterprises was successful for very long. Costs were too high, services too poor, and the greater efficiency of railroads drove out the canals and turnpikes by mid-century so that road building was taken over early as a public enterprise based on social decisions financed by taxes and other revenues.

Thus the initial allocation of land to public purposes was guided by a political decision to settle the state, using proprietorship in common and free land as a subsidy. The institutions of private property and legal contracts developed a class of entrepreneurs who used their resources to clear the state for farming, stimulated largely by the prices that flowed from a market system. Certain large construction projects were guided by a combination of public decisions and private business in the form of regulated monopolies. The free market economy was never as free as many people think, subsidies were used to encourage larger developments, tariffs protected industries, land grants promoted settlement, and many prices were fixed by public decree. A mixed economy and a mobile society have been with us for a long time.

The Growth of Cities

The middle of the 19th century was probably the high water mark of land clearing and cultivation, but the middle west opened as long distance transportation was cheapened and local agriculture went into a decline. Simultaneously manufacturing increased, creating a greater and greater concentration of people in cities. With the decline of agriculture the forest tide rose again as trees moved in and took over the fields and pastures that went out of cultivation. As people huddled closer and closer together in cities the trees reoccupied most of the landscape in Massachusetts. Although farmers moved off the land the total population of the state grew rapidly so that by 1890 a density of population map (Map III) looked much like the first settlement map, with most of the people living in the Boston Basin and along the Merrimac and Connecticut rivers. By 1920 population rose from 2.2 million to 3.8 million, but most of the growth took place in and around the urban centers of 1890 (Map IV). By 1965 when there

were almost 5.3 million residents the same growth points prevailed (Map V) suggesting that urban areas have advantages people want in spite of the difficulties caused by crowding. Although the state now averages over 670 persons per square mile, or about one citizen per acre, densities range from as much as 13,000 per square mile in Boston to as few as 8 in the town of Washington.

Forests and People

Map VI shows that Massachusetts woodland is now concentrated where people aren't. The black area contains 74 percent of the total land but only 13 percent of the population, and all these towns have more than 1 acre of forest per person. The dotted area covers 21 percent of the land and holds 37 percent of the people in towns that have from one-tenth of an acre to one acre of forest per person. The white area around the Boston Basin, Worcester and Springfield contains only five percent of the land, but has 50 percent of the people living in towns with no more than 0.1 of an acre of forest per person. Thus over four-fifths of the people live on about a quarter of the land, in towns that have one acre or less of forest land per person and over half these towns have no more than a few hundredths of an acre of woods per capita.

It is obvious from the last map that forest land and trees play a variable role in this state even though as a whole it is considered highly urbanized. Trees are very plentiful compared to people over about three-quarters of the state, in moderate supply over much of the rest and in short supply on only about five percent of the state. Of course, at least half the people might feel that they don't live with enough trees and only 13 percent could believe that they had more than they need. Even in the core cities, however, there are a good many trees along streets, in parks and waste corners and none of these were counted in the forest land figures.

However, area figures alone are a poor measure of the contribution of trees and woods to the cultural environment of a city or suburban area because so much depends on the flair for design or the accidents of growth that have located the wooded areas and trees where they are accessible to people and where they can have a maximum effect on the quality of a neighborhood. The importance of design is apparent when we look at what are thought of as the best of the inner ring of suburbs. Take Newton, Brookline, Wellesley, Lexington, Winchester and Woburn, for instance. As a group they have only about five hundredths of an acre of forest land per person; none-the-less only about half the land is in urban development and the rest is in forest or other open space. This works out at about 90 acres of forest and open space per 1,000 people, which is very close to that magic (and probably mythical) 100 acres once dreamt up as a desirable aesthetic goal.

Space for Growth

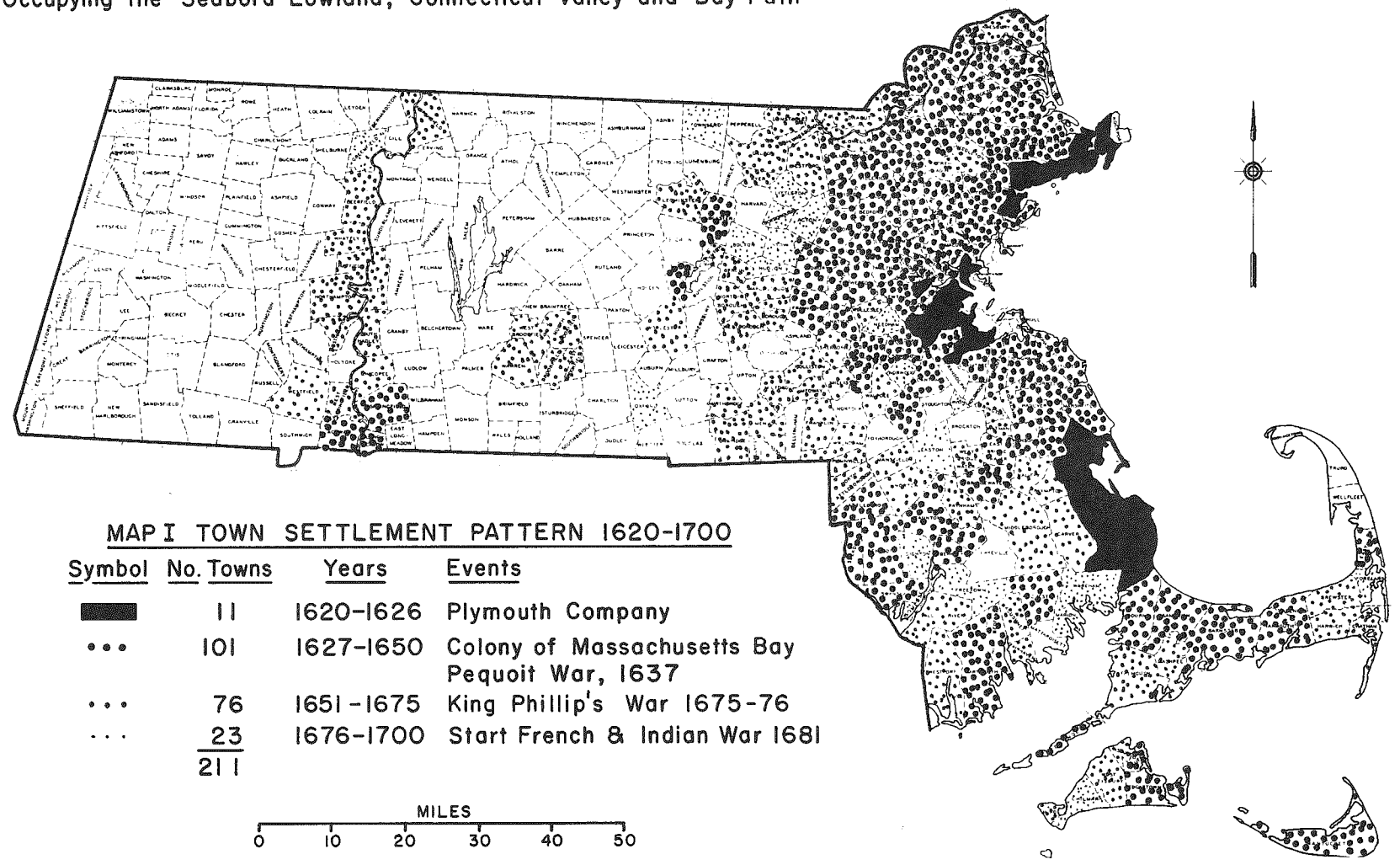
It is clear from the maps we have seen that population growth during this century has been in and around the places where people had already congregated. If this trend continues, as seems most likely, how many people can we accommodate and what design standards can be met? One approximation can be made by looking at the dotted area on the last map. This cluster of towns now settled at a medium density is already served by a considerable mileage of roads, and other community services are at a rather high level, so that they seem better able to absorb more people than the less densely settled or very congested parts of the state. If these outer ring towns should grow to the same density as the prestige towns of the "Newbrookley-Lexchesterburn" group the area could contain about 7.2 million people. This would be an increase of about 5.3 million, slightly more than the present population of the entire state. Thus, without moving more people into either the present high or the low density towns, a most unlikely possibility, Massachusetts could accommodate twice its present number of citizens, all in towns with about half their area kept in forest and at densities no higher than presently found in the more desirable suburbs. If population grows at the 1960-65 rate of half a percent a year this would provide space enough until at least the year 2100. Thus, there seems to be no outright shortage of space for growth, even in the parts of the state located near the present core cities.

Although this precise pattern of growth is most unlikely it appears that for a long time to come the citizens of Massachusetts will have space enough to design the kinds of urban environments that they prefer if they can devise social systems to do it. Living space itself is probably last on the list of things that will limit carrying capacity, coming after such essentials as adequate jobs, potable water, clean air, effective waste disposal and transportation systems. But even if these problems are solved is it realistic to believe that all the land in the state is available for urban development?

Land Prices and Values

Land for living purposes is immovable so each plot has a unique location, and cheap transportation can only partially overcome this fact because people also have only a limited amount of time they can give to moving about. The private market system that is generally setting the value of land reflects this fact – in the core cities land values are exceedingly high because many demands create an acute scarcity. Moving outward, values fall as undeveloped land increases and commuting time rises, but even at the suburban fringes prices are rising rapidly because speculation anticipates greater demand in the near future thus spreading the wave of higher land values. Even further out another need – the demand for second home and recreation sites – stirs a considerable ripple in the value of open or forested land. Thus the actual shortage of land plus the expectation of shortage can considerably raise private values even before much change is readily apparent.

Occupying the Seabord Lowland, Connecticut Valley and Bay Path



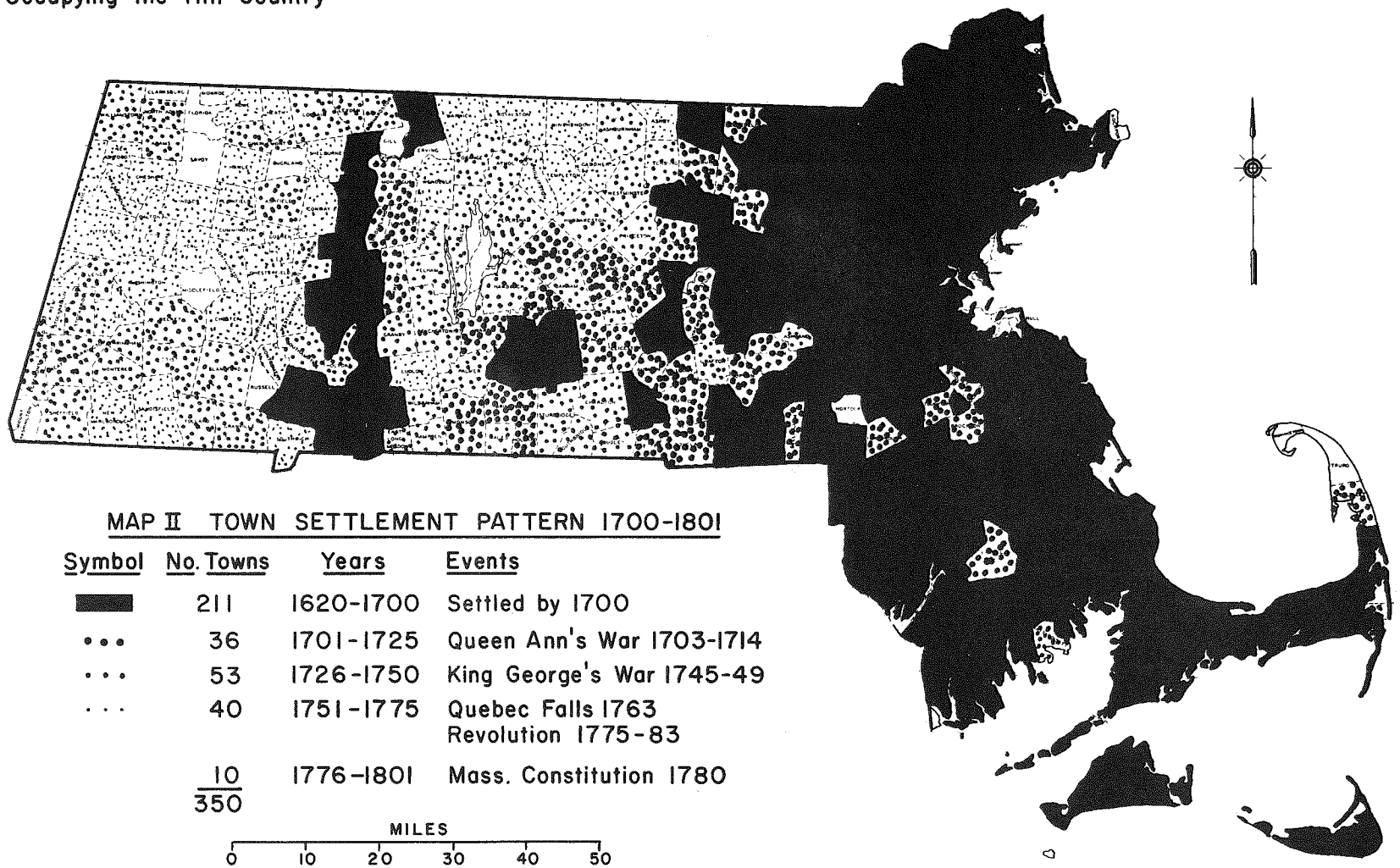
MAP I TOWN SETTLEMENT PATTERN 1620-1700

Symbol	No. Towns	Years	Events
▬	11	1620-1626	Plymouth Company
• • •	101	1627-1650	Colony of Massachusetts Bay Pequoit War, 1637
• • •	76	1651-1675	King Phillip's War 1675-76
• • •	23	1676-1700	Start French & Indian War 1681
	211		

MILES

0 10 20 30 40 50

Occupying the Hill Country

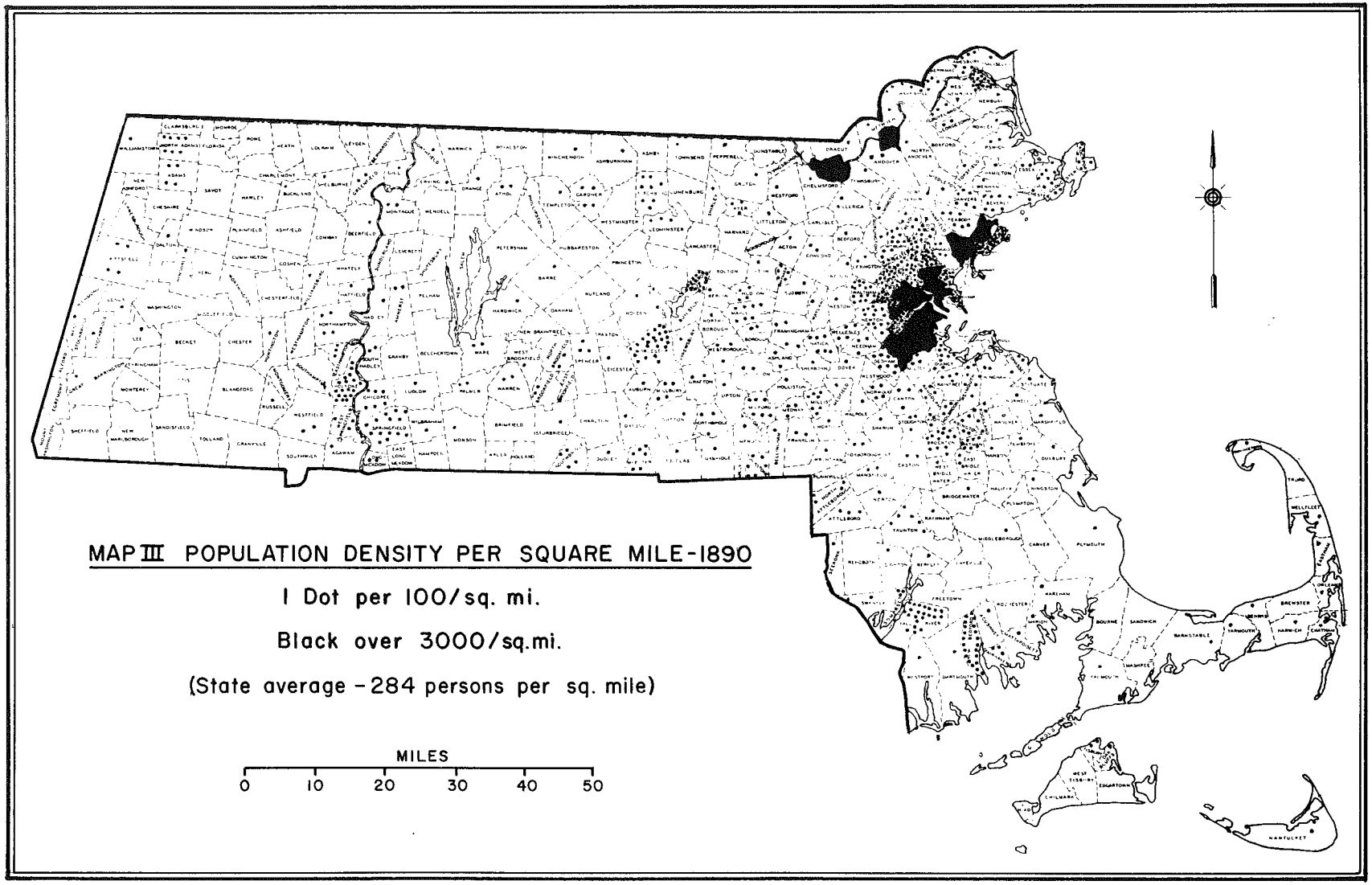


MAP II TOWN SETTLEMENT PATTERN 1700-1801

Symbol	No. Towns	Years	Events
■	211	1620-1700	Settled by 1700
• • •	36	1701-1725	Queen Ann's War 1703-1714
• • •	53	1726-1750	King George's War 1745-49
• • •	40	1751-1775	Quebec Falls 1763 Revolution 1775-83
	10	1776-1801	Mass. Constitution 1780
	350		

MILES

0 10 20 30 40 50



MAP III POPULATION DENSITY PER SQUARE MILE-1890

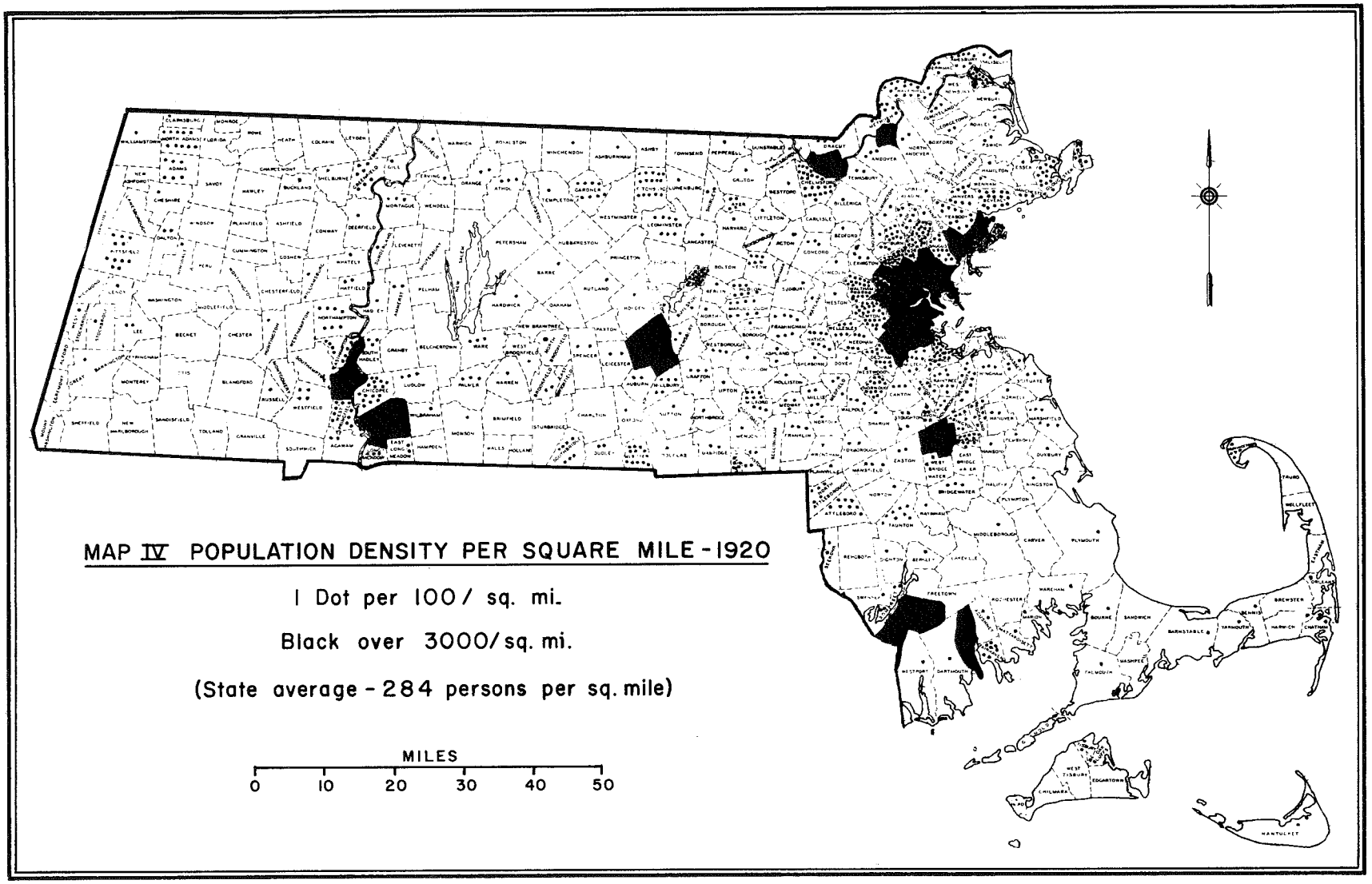
1 Dot per 100/sq. mi.

Black over 3000/sq.mi.

(State average - 284 persons per sq. mile)

MILES

0 10 20 30 40 50



MAP IV POPULATION DENSITY PER SQUARE MILE - 1920

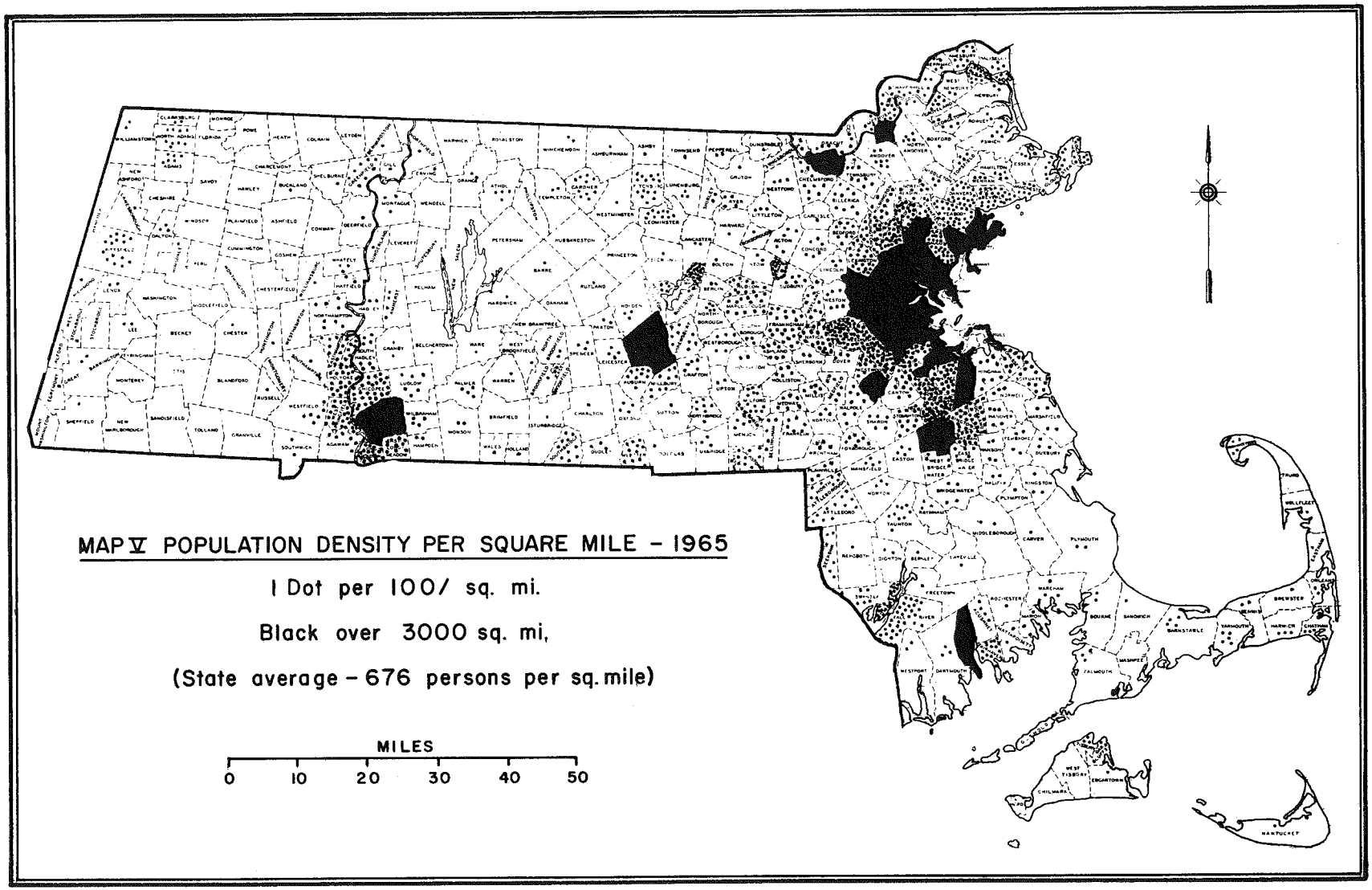
1 Dot per 100 / sq. mi.

Black over 3000/sq. mi.

(State average - 284 persons per sq. mile)

MILES

0 10 20 30 40 50



MAP V POPULATION DENSITY PER SQUARE MILE - 1965

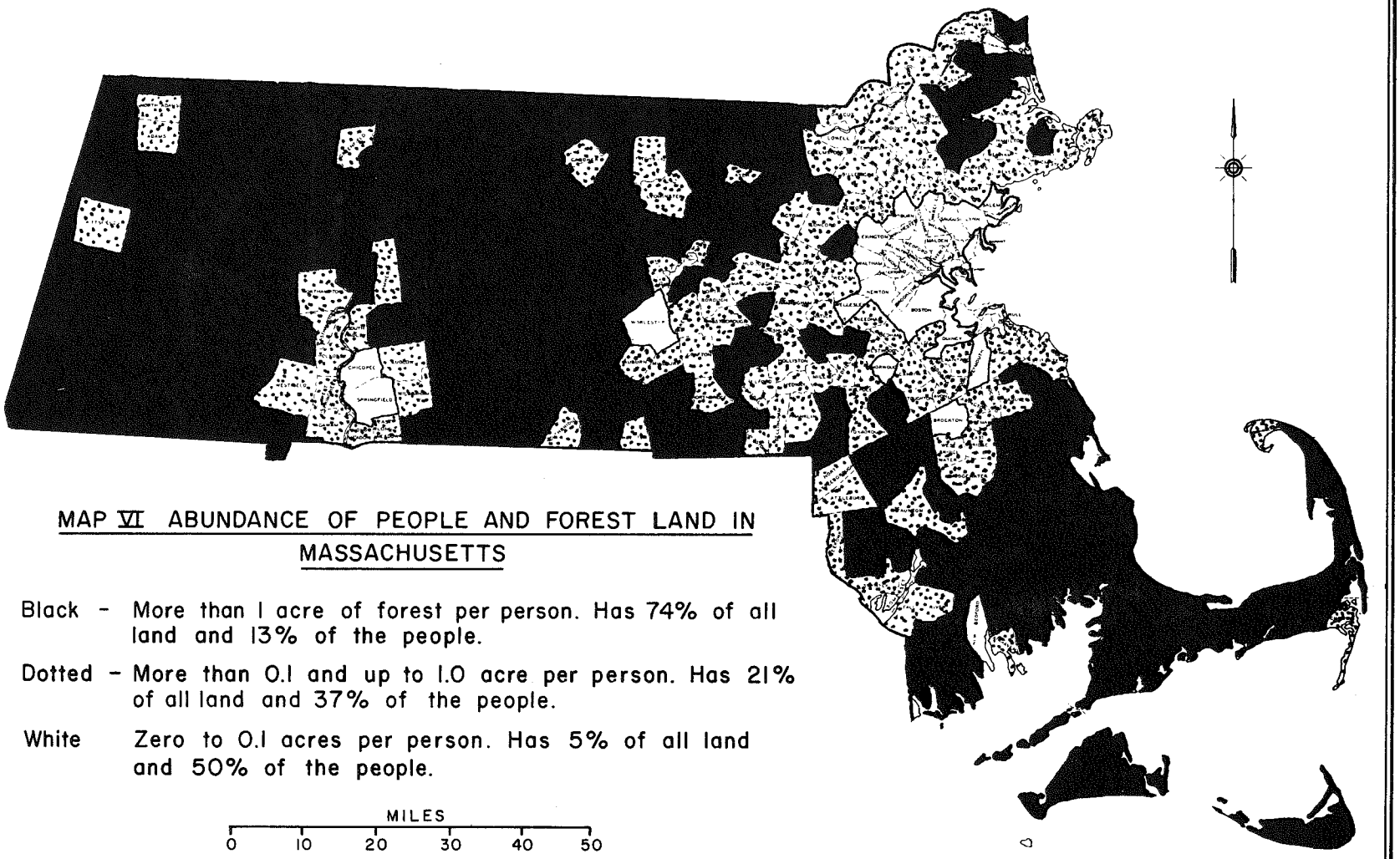
1 Dot per 100/ sq. mi.

Black over 3000 sq. mi,

(State average - 676 persons per sq. mile)

MILES

0 10 20 30 40 50



MAP VI ABUNDANCE OF PEOPLE AND FOREST LAND IN MASSACHUSETTS

Black - More than 1 acre of forest per person. Has 74% of all land and 13% of the people.

Dotted - More than 0.1 and up to 1.0 acre per person. Has 21% of all land and 37% of the people.

White Zero to 0.1 acres per person. Has 5% of all land and 50% of the people.

MILES

0 10 20 30 40 50

The fact that market prices are based on private expectations about the future, which are only partly based on records of past performance, greatly affects our capacity to design the kind of urban environments we want, because individual initiative and imagination so often outstrip public action and preempt land for private use by raising prices to prohibitive levels. Because the private market system responds to individual expectations it is peculiarly effective in reflecting those values that people can capture personally. For the same reason market values are likely to discount those values that accrue to the public in general, especially benefits to which everyone has free access such as enhancing the quality of air, improving water relationships and creating a felicitous landscape.

Balancing Public and Private Values

To redress the balance struck by the private value system several public schemes have been in use for many years and new ones are coming into prominence. The most radical interference with the market system is outright public ownership and management. When backed by the right of eminent domain this allows the courts to mediate between private prices and public values. Purchase with lease-back or resale for specific private purposes is a variant of public ownership which is sometimes used to direct land into preferred uses or eliminate deleterious operations. Another approach has been to purchase from private owners only one or a few of the rights associated with ownership, leaving the rest under private control. Thus easements have been bought for the preservation of scenery, hunting, access and a host of related purposes. This approach seems to work to the mutual advantage of the individual and the public when done in areas where the demand for land has not reached too high a pitch. If prices are too high, buying one right may cost as much as buying all.

Short of ownership in fee there are many political techniques that can influence the private value system. Local zoning regulations have been used widely to direct land use in urbanizing areas primarily by prohibiting land uses that are directly prejudicial to public health and welfare. So far this technique has been little used in connection with woodlands. State legislation has also been used to enforce preferred land management practices that are clearly beneficial, or where neglect would endanger vital public benefits. Various cutting practice regulations, slash disposal to reduce fire danger, and prohibition of operations during high hazard periods are examples familiar to all foresters. There are a host of similar legal constraints on land use in agriculture designed to protect food quality and suppress plant diseases and insect pests. Another recent constraint in this state is the legal protection of coastal and inland wetlands against development.

Even though we have placed main reliance on the private market system to set the values that direct land use in Massachusetts we have also utilized public steps through the political system to constrain use and thus indirectly influenced prices and the final design of space utilization. Thus we have had neither a pure private market system nor a straight political system but rather various blends of the two as value setting mechanisms, and each combination has had a different impact on land-use allocation.

Earlier we identified three areas of the state where high, medium and low densities of settlement make the forest land-use situation sufficiently distinct to warrant individual treatment and perhaps justify a separate blend of value setting mechanisms for each. Of course, these areas are not completely uniform because there are enclaves in each where the forces that set forest values are similar to those of some other region, however, it will simplify the discussion and perhaps highlight differences to treat them as though they were uniform.

Dense Settlements

Looking first at the core cities and the inner ring of highly populated suburban areas, the main patterns of developed land, forest and open space are already set. Land of any kind is so scarce in relation to unsatisfied needs that private market prices are very high and are unlikely to allocate much additional area to forests. In fact there is a constant political alert to just maintain present open space against public or private development. In these areas main reliance for innovative land use must be placed on values generated by the political system because most of the benefits are environmental and public in nature. Although trees and woodland may go a long way toward softening and humanizing an otherwise man-made landscape, public aesthetic tastes are only weakly reflected by private prices. It is likely that any substantial change in the pattern of tree cover for public purposes, especially in the core areas, will have to be accomplished by full public ownership rather than regulation. However, a little can be done by less than fee ownership in some of the suburbs where creative landscape gardening generally adds more than it costs to the sale value of the property. Around homesites much of the satisfaction of trees is captured by the owner directly, but the incidental spin-off to the public is a central factor in setting the tone of the environment.

Where people live close packed the land is so taken up by transportation and structures that there is little scope for adjustment; however, it is precisely in these areas that the arms of government are best developed and most capable of making plans and following through with effective action. Unfortunately, it is also here that the need to improve such cultural elements of the total human environment as education, incomes, jobs, housing and transportation all give stiff competition for talent and funds to such natural elements as trees and forest. The cities' purses are simply not long enough to solve all these difficulties at once. Even after tapping state and federal government resources success has not automatically followed. It appears that new ideas about what to do are needed, together with some new alliance between the

public and private sectors to search out long-term solutions. Only if woodland significantly ameliorates the fevered environment of city people are we likely to gain some quiet and uncomplaining trees.

Moderate Density Areas

Moving further out to the exurbs where population density is appreciable but not too high, a good deal of undeveloped land is still covered by trees. Here there is considerable scope for designing urban landscapes that have a place for trees and woodland, but the imperatives of profitable development are such that private efforts to improve the environment have mainly taken the form of large lots designed for the very affluent. Private market values have allocated little if any land to public open space or low-cost housing except when goaded by public decisions.

However, many of the people settling in these rapidly growing areas bring into the community a high committment to civic improvement. Many perceive an environmental role for trees and open spaces, and are prepared to use the engines of government to insure more sensitive land use. Such people frequently accept the idea of planning and are willing to shoulder the responsibility and do the necessary work. When these folk happen to take common cause with the older residents they get community action that runs the full gamut from public ownership through zoning to easements to organized public opinion, all of which can effectively mitigate the private market system. Thus the chances of getting growth patterns in the middle distance towns altered to favor a tree covered landscape seem quite high – the forest land still exists, the need is recognized and the talent and other resources are available to energize local institutions to harmoniously blend public and private value systems. It is no accident that some of the most effective Conservation Commissions and Planning Boards are in these towns.

Although the chances of effectively harnessing value systems to the task of building a humane environment seem best in these towns the short-run effect is likely to redound primarily to the advantage of the already well-off, thus further exacerbating the difference between rich and poor. A satisfactory method of sharing an improved environment with the underprivileged who can least afford it has not yet been invented. The State Legislature has recently made a move to loosen zoning laws that have the effect of restricting low and middle income housing. And there are indications that the new census will show that many minority people have already started to trek out of the core cities into the suburbs. If this move is not to end in another blind alley, however, jobs and transportation are also needed to help the poor use the suburbs as a means of moving out of the slums and into a more satisfying and open-ended life.

Low Density Areas

Turning now to the low density areas of Massachusetts, it is not surprising that most of the forest land is found here along with most of the problems of rural poverty because this is a juxtaposition common throughout the world. With some obvious exceptions, too many of the long-time citizens of these forested areas are underemployed and in the lower income brackets, even though many of the new neighbors are well-to-do enough to live in second homes, vacation properties or make long commutes to well-paid careers in the city. With few jobs, a small tax base and a plethora of forest land it is understandable that any kind of development is often preferred to having none at all – no matter how deleterious haphazard change may be in the long-run.

Local folk and summer people have generally marched to different tunes and found that their interests were quite far apart, so the need for public regulations to modify private development has seldom been unanimously felt. Especially if the short-run effect would be to slow development and industrial jobs. The felt need has generally been for some kind of prompt and direct action and this has been the sort of change the private market system was designed to get. Public permissiveness has already produced some low-grade subdivisions for vacation and year round homes where the precepts of good site planning have been ignored to the point of creating dangerous and often illegal sanitary and flood situations. Most of these safety problems could have been corrected if the state had enforced its own laws or had helped local officials charged with state code enforcement to acquire the expertise and willingness to act.

In the low density towns that include about three-quarters of Massachusetts there has been almost no sense of urgency to exert public control over anything, least of all the management of forest land to preserve its public values. Only on municipal watersheds where there is a clear connection between land use and public health and safety has much been done. Although educational, state forest conservation laws have seldom imposed any burdensome constraints on private management, which has largely responded to the prodding of market prices. However, the conceptions of rural people are changing as the demands of urban people bid up the prices of land and it is seen that real values lie not simply in space, but also in the presence of an attractive, healthy and uncluttered landscape. It is becoming apparent that amenity values are not only hard to define, but also are so fragile that they are likely to be ground up by the machinery of private market systems. This probability is leading some rural residents to want public protection for forest and farm environments.

If the small towns are to effectively divert the dynamics of land use into preferred channels without stifling all change they must do some rather sophisticated planning. Most of them cannot muster the requisite talent so some new kind of joint action is needed to pool their limited resources in support of sensitive and practical land-use planning. We should bend every effort to make sure not only that more expert planning is done, but also that the

responsibility for decisions on local issues is kept at the town level. There is little sense in creating another layer of government so remote from the people it serves that they loose the sense of participation that is so important a virtue of the town system. There is enough frustration because of distant and seemingly unresponsive governments in urban areas to show us that we don't want a rural version of the same thing.

Future Prospects

If Massachusetts is a fair sample of megalopolis we are faced by a number of paradoxes that cause problems and offer opportunities. This heavily urbanized state has great numbers of people crowded into small spaces, but it also has large areas of thinly settled land so that space itself need not limit future growth. There is room enough to design pleasant living areas if we can set up rules that stimulate desired development.

Because in the humid East trees take over any land not used intensively they are probably a permanent part of the landscape outside the urban cores. However, those most likely to benefit from wooded areas are the folk New Englanders call "comfortably well off". Foresters and planners should have no great trouble finding common cause with middle and upper income groups who already have both market power and political strength.

The urban poor, however, have little contact with trees, and rightfully give matters of bread and butter, cultural identity and political strength a clear priority over improvements in their natural surroundings. Although the rural poor live in a forested landscape they can find scant comfort in the fact until they too enjoy a better living and get more social and economic security. If they want the poor as clients, foresters and landscape designers will have to discover imaginative ways to improve the lot of the underprivileged by combining natural and social elements into a new concept of human environment.

It seems clear that there is no automatic system of evaluating land and trees that will organize their use for both public and private welfare. Therefore we must give thought to all our actions because neither "Mother Nature" nor "Society" are independent forces that will cover up our mistakes and create an environment where we can crowd and still be kind.

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Data for all maps were derived from:

1) Classification of Land Cover Types by Towns, Publication No. 12, Cooperative Extension Service, University of Massachusetts, June 1967. One document for each county.
2) The Decennial Census, 1965 compiled by Kevin H. White, Secretary of the Commonwealth.
3) The Population of Massachusetts 1920, Commonwealth of Massachusetts, House No. 1610.