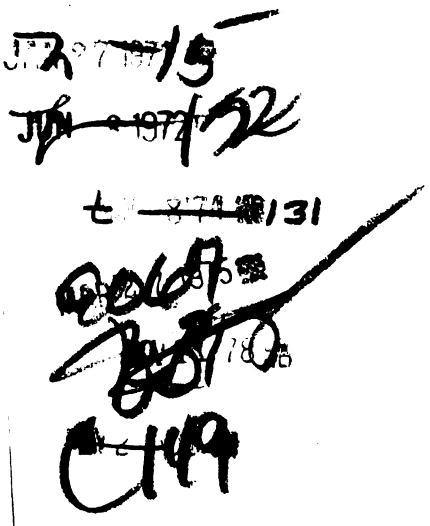
AN ANALYSIS OF THE SUCCESS AND ACCEPTABILITY OF THE DUTCH ELM DISEASE CONTROL PROGRAM IN LANSING, MICHIGAN: 1956-1965

Thesis for the Degree of M. S.

MICHIGAN STATE UNIVERSITY
THEODORE JAMES HASKELL

1966



ABSTRACT

AN ANALYSIS OF THE SUCCESS AND ACCEPTABILITY
OF THE DUTCH ELM DISEASE CONTROL PROGRAM
IN LANSING, MICHIGAN; 1956-1965

by Theodore James Haskell

The purpose of the study was to examine the events leading up to the beginning of the Dutch Elm Disease Control Program in Lansing; to analyze the development of the control program between 1956 and 1965; and to identify the distinctive pattern of Dutch elm disease control practiced in Lansing.

The procedure involved a search of the literature on the nature and the control of the Dutch elm disease. An analysis was made of the Lansing program through examination of budget and program records, correspondence, and personal interviews.

The Dutch elm disease is a fungus that will kill any of the native elms. Technical control procedures concentrate on scouting, to locate the diseased trees; sanitation to destroy all diseased trees and all other elm wood capable of breeding the bark beetles that carry the disease. Spraying is also used to protect valuable elms from infection by bark beetles. Research is being conducted on resistant trees, improved chemical controls, and biological controls. State and federal research helps local programs.

Under professional leadership Lansing was able to apply the recommended technical procedures by means of a strong administrative structure based on systematic evaluation and public relations.

As an isolated control area with a large number of native elms, both public and private, Lansing experienced a steady increase in elm losses,

particularly in the areas annexed between 1956-1965. Lansing has sustained the program in spite of these losses because both the elected officials and the general public support the long-range position established by the professional staff: THAT the community should continue to oppose the Dutch elm disease because the alternatives, (1) the high cost of removals to be met in a short time, and (2) the loss of mature shade trees to the community, are more costly to the community as a whole than the annual cost of the program.

This pattern of a professionally directed combination of technical and administrative procedures has implications not only for other Dutch elm disease control programs, but also for other similar programs that must sustain public support over a period of time.

These programs should be based on the best technical information available and adapted through administrative procedures to the specific requirements of the community. This has to be done by men with professional abilities and attitudes, because only such men will be able to earn the public support necessary to sustain the control programs.

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By

Theodore James Haskell

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

MASTER OF SCIENCE

Department of Resource Development

1966

ACKNOWLEDGMENTS

For discussing the subject with me and for giving me constructive criticism and factual information, I am indebted to a number of my friends. First to my major professor, Louis F. Twardzik, Associate Professor, Department of Resource Development, Michigan State University, for his assistance and guidance. To Dr. Milton H. Steinmueller and Dr. Raleigh Barlowe, Chairman, Department of Resource Development, and Professor Charles Barr, School of Urban Planning and Landscape Architecture, Michigan State University, for their interest in acting as members of my committee.

To Charles Hayden and the staff of the Department of Parks and Recreation, City of Lansing, and to C. A. Boyer, Plant Industry Division, Michigan Department of Agriculture, for their help in gathering materials.

Theodore James Haskell

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GENERAL STATEMENT OF THE PROBLEM

Purpose

The purpose of the study was to examine the events leading up to the beginning of the Dutch Elm Disease Control Program in Lansing, to analyze the development of the control program between 1956 and 1965, and to identify the elements of the distinctive pattern of Dutch elm disease control as practiced in Lansing.

Delimitations

Location. The study was confined to the Dutch elm disease program, policies, and procedures carried on in Lansing, Michigan.

Time. With the exception of selected historical events preceding the discovery of the Dutch elm disease in Lansing, the study is concerned with the active control program carried on over a ten-year period beginning January 1, 1956 and ending December 31, 1965.

Definitions of Terms Used

Dutch Elm Disease. A disease that kills elm trees. It is caused by a fungus growth that results in a plugging of water conducting tubes in the trunk and branches. The fungus is spread from tree to tree by bark beetles and through root grafts.

Community. A number of people living in the same place under the same laws. It is not only a social relationship, but an ecological one between the people and the land, binding them together by the way in which they wish to live.

Policy. A predetermined course of action to be followed by the elected officials, appointed officials, or designated individuals of the community in meeting the needs of the community.

Program. A plan with a sequence of steps to be followed in implementing community policy to solve problems and meet needs.

Procedure. The manner or method established to carry out plans and programs in an orderly and regulated manner.

Rationale. The underlying reasons for a procedure, a rational foundation for subsequent decision making.

Technician. One who is skilled in the specialized methods essential to execution of control programs.

Professional. One who devotes himself directly to an occupation on which he is an expert in an effort to follow, by education and experience, the recognized standards of the occupation, and who is able to teach and explain these standards to the community he serves.

Administrator. One responsible for a public trust who serves by managing or directing the execution or conduct of programs, skilled in the use of various means to accomplish a designated end.

Elected officials. Mayor and City Council.

Significance of Study

In the Dutch elm disease control programs there are situations in which action is forced upon a community by outside forces. In the Dutch elm disease and its principal carrier, the European elm bark beetle, there is a tremendous potential for killing elm trees. The dead elm trees in turn represent a double loss to the community.

All such dead or dying trees located on street right-of-ways become a menace to people traveling the streets. These trees must be removed at public expense. Dying trees on private tracts, while not necessarily a direct menace to the public as a whole, become a potential hazard to the community as a breeding place for bark beetles. Beetles from diseased elm trees may carry the infection to many other trees on nearby properties. Further, such dead trees may well become a direct menace to the life and property of the individual property owner.

In addition to the very real costs of removing dead trees, there are less tangible costs of property values from the losses of well-located shade trees. There have been a number of methods and various professional formulae developed over the years to make such appraisals. While the relative value of the elm tree has had some revision over the years due to the impact of the Dutch elm disease, there is still a definite loss to community values involved in the loss of community shade. If it may be assumed that a city grows or declines to the degree that it remains more or less attractive to the people who would live and work there, then pleasant shaded streets[1] and parks are of value.[2] Dead trees do not beautify a city.

This potential loss to the community is one that forces a city to spend money. The decision is not, as some communities decided, a choice between spending money or not spending money, but rather a choice between spending some money on a regular basis for a control program or substantially more for removing dead trees and absorbing the community "intangible" losses as inevitable. It is also a choice between recognizing it as a community problem and spreading the costs over the community as a whole, or letting the burden fall on those who happen to have elm trees on their property.

John Hart surveyed control programs in the southern half of the Lower Peninsula of Michigan during 1964. He reported an expenditure of 5-1/4 million dollars by public agencies and 3-1/2 million dollars by private owners. By comparing the estimated cost of removal with the formula value for a tree of the same size, and projecting the ratio (removal cost about 1/5 of computed value) to the cost of removals, he estimated the

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[1]F. Stuart Chapin and Shirley F. Weiss, Urban Growth Dynamics (New York: John Wiley and Sons, Inc., 1962), p. 385.

[2]Okah L. Jones, "Parks are Important to Business Too," Proceedings of the International Shade Tree Conference: 1963, ed. Paul Tilford (Wooster: Collier Printing Company, 1963), p. 95.

loss in esthetic value to the people of Michigan to be slightly over 30 million dollars for 1964 alone.[3]

The history of the disease in Michigan communities has been one of rising losses and rising costs. The rate of increase has been moderated by community control programs carried out with the cooperation of the Michigan Department of Agriculture. Faced with the natural ecological factors inherent in the problem, these communities in general and Lansing in particular, have devised and implemented control programs. As the ecological factors have changed these policies and procedures have been revised repeatedly to minimize losses and balance costs and benefits on both a short-run and a long-run basis. Preliminary search of the literature showed a number of reports and studies of programs. Most of these deal with the technical aspects of control programs and have not attempted to relate the innovative, administrative and public relations work of the administrator to the decision making of the elected officials and the community.

Moreover, of 443 communities in Michigan participating with the State Department of Agriculture in a control program in 1956, only 121 were still participating, even in a limited capacity, by 1965.[4] Was there a common factor: a similarity in the natural situation, professional techniques, or community attitudes that might explain why some communities were able to sustain a control program while other cities decided to drop the effort?

This study examined the development of a number of key procedures in the Lansing Dutch Elm Disease Control Program so that the experience of the people of Lansing in sustaining a control program might be of some value to other communities confronted with similar problems.

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[3]John Hart, "Economic Impact of Dutch Elm Disease in Michigan," Plant Disease Reporter, XXXXIL, 10 (October 1965; Journal Article No. 3690, Michigan Agricultural Experiment Station), pp. 831-32.

[4]Plant Industry Division, Michigan Department of Agriculture, "Dutch Elm Disease Report: 1956," and "Plant Pest Control Annual Report: 1965." (Mimeographed.)

Hypothesis to be Tested

That the Dutch Elm Disease Control Program in Lansing involved more than the use of the standard techniques of scouting, sanitation, and spraying; that in addition to these technical procedures, there are certain administrative procedures of public relations and systematic evaluation that must be incorporated in the program if it is to be sustained over a period of time.

Assumptions

That the department's control program has been recognized by experts as being effective, and so worthy of analysis.

That examination of the departmental records of the program were sufficient to obtain a meaningful pattern of the evolution of the policies and procedures.

That the continued budget appropriations over the ten-year period indicate a degree of confidence expressed by the people of the community, through their elected decision makers, in the administrators and technicians with responsibilities for the program, and agreement with the goals and procedures developed by these specialists.

Procedure

The study began with a search of the literature regarding Dutch elm disease, importance of trees to the community, and the community action process.

Further information was obtained by examination of budget and program records and reports, correspondence, schedules and other records of the Department of Parks and Recreation, City of Lansing, from 1956 through 1965.

Finally, selected interviews were held with those having first hand experience in such control programs.

Results were analyzed, relationships pointed out, conclusions drawn and implications described.

CHAPTER II

REVIEW OF LITERATURE

I wonder about the trees
Why do we wish to bear
Forever the noise of these
More than any other noise
So close to our dwelling place?[1]

Much has been written on man and his relationship to trees. Why do we have trees in our cities when they must be maintained at considerable expense? Surely the use of public funds must indicate a recognition of value to the community.

Literature on Trees and the Community

In dedicating a tree planted on the lawn of the Michigan State Capitol, Ralph A. MacMullan, Director of the Michigan Department of Conservation, said "Historically, man and trees have held a close partnership in shaping this great land of ours. Man has used trees for shelter and food — for both body and soul."[2]

Charles Lathrop Pack wrote of trees and the city beautiful, "The best works of artist and architect must have trees to set off and enhance their splendor."[3] He also stressed that the city beautiful is also the city healthful. He summed up the importance of trees with the following words: ". . . the tree, therefore, should be recognized as blending beauty, poetry,

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[1]Robert Frost, Pocket Book of Robert Frost's Poems, Introduction and Commentary by Louis Untermeyer (New York: Washington Square Press, 1960), p. 226.

[2]Ralph A. MacMullan, "Unity Through Trees," Presented as a part of the National Tree Planting Ceremonies held in Washington, D. C. and many state capitals, August 16, 1965.

[3]Charles Lathrop Pack, Trees As Good Citizens (Washington: American Tree Association, 1922), p. 19.

sentiment, and romance with the practical and important elements of profit and health."[4]

William Solotaroff wrote Shade Trees in Towns and Cities in 1911. This book shows an early awareness of the importance of trees to the community.[5] Conversation with H. Lee Bancroft, Superintendent emeritus of the Department of Parks and Recreation, Lansing, indicated that he relied heavily on Solotaroff in organizing the Lansing street tree programs.[6]

During the process of settlement, Solotaroff explains, natural features of the land were often swept away. The frontiersman regarded the forest as an enemy to be vanquished rather than as a friend to be protected.

As the cities developed and acquired additional wealth, education and culture, "there has come the recognition that cities must not only be the sites of manufacture and commerce, but attractive places in which one would wish to live."[7] Like Pack, Solotaroff stresses the city beautiful and the city healthful. He sums up his position this way.

> A modern progressive city possesses three assets — its industries, its commerce, and its appearance, the outward and visible evidence of its character. "Show me your town and I will tell you the kind and quality of its citizens." . . . the morale of a people is unquestionably in exact keeping with the outward appearance of its municipal home.[8]

While it is true that the value of trees cannot be defined as precisely as that of an automobile or a building, perhaps it can be inferred by the action of the people. Pack noted that many subdividers plant trees, on the lots and on the street frontage, because experience has shown them that in the sale of homes in a new residential area, trees are as essential as sidewalks and paving, and second only to sewer, water, gas, and electrical connections.[9]

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[4] Ibid., p. 24.

[5] William Solotaroff, Shade Trees in Towns and Cities (New York: John Wiley and Sons, 1912), p. 2.

[6] Conversation with H. Lee Bancroft, May 8, 1966.

[7] Solotaroff, p. 2. [8] Ibid., p. 5. [9] Pack, p. 25.

In their community attitude surveys in North Carolina, Chapin and Weiss found that "big shade trees" were considered to be extremely desirable, ranking even higher than parking space. Of 357 people surveyed, 258 picked "big shade trees" as one of the most desirable assets to a community.[10]

When communities are in competition for business and industry, many of the basic facilities, such as streets, water supply and sewers, transportation, labor market and good government, seem equally advantageous. Then the decisions to locate are made on the basis of the "amenities" that the communities offer.[11] Ian Nairn goes further and declares that trees are more than just a vegetable amenity, they are living partners in the environment.[12]

Oliver Wendell Holmes called the elm a "great green cloud,"[13] but its assets to a community include not only beauty, but adaptability. The American or white elm (Ulmus americana) has the widest geographical range of all the native hardwoods and apparently the Dutch elm disease is capable of following it to the furthest limits.[14] The elm has the ability to grow on many different soils and endure a great range of temperatures.[15] It is a tree of the forest, farm yard, village green and city street. It is a "matchless urban tree." It is not only beautiful, it is as rugged as a weed. It can live in almost any filth of smoke and soot and noxious fumes that man himself can tolerate.[16]

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[10]Chapin and Weiss, p. 396. [11]Jones, p. 97.

[12]Ian Nairn, The American Landscape (New York: Random House, 1965), pp. 88-92.

[13]Berton Roueche, "A Great Green Cloud," New Yorker, July 15, 1961, p. 35.

[14]Ibid.

[15]Edward G. Cheney, American Silvics and Silviculture (Minneapolis: University of Minnesota Press, 1942), p. 451.

[16]Roueche, p. 36.

A tree with such magnificent virtues is not without magnificent faults. The wood is good for very little. Under many difficult growing conditions it is sickly. The leaves and limbs are eaten by cankerworms, gypsy moths, and borers. It is infected by wetwood bacteria and the virus of mosaic; by black leaf spot, Dothiorella and Verticillium wilts, and last of all, by the Dutch elm disease — deadly, uncontrollable, and of explosive spread.[17]

Perhaps it would seem that with all these flaws there would be a less vulnerable substitute for the elm tree. But, as Gurdon Dennis recounted, "all the substitute trees have their problems." Sycamore needs three sprays a year to fight anthracnose. The Ash is plagued with borers. Mountain Ash gets fire blight and borers. The London Plane is susceptible to cankerstain, and most of the maples, for all their brilliant color and graceful silhouette, are not as tolerant as elms of the urban soil conditions.[18]

Because of its virtues, or perhaps in spite of its faults, the elm has been widely planted in midwestern cities. These trees, planted by citizens for their children and those who would follow them, become a civic heritage shared by the community as a whole. This civic heritage was threatened by the Dutch elm disease.

Literature on Dutch Elm Disease Control Programs

Faced with invasion of the Dutch elm disease and the millions of elm bark beetles, communities reacted in different ways. Some, like Greenwich, Connecticut, began a systematic program at the first sign of wilting elm trees.[19] In others, such as Syracuse, New York, the disease made serious inroads until an aroused citizenry forced the city government to take action.[20]

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[17] Ibid.

[18] Gurdon K. Dennis, "Status of Detroit's Dutch Elm Disease Control Program," Proceedings Dutch Elm Disease Conference: 1961, p. 14.

[19] Joseph A. Dietrich, "Greenwich, Connecticut, Control Program," Control of Dutch Elm Disease, Proceedings of Statewide Conference, November 10, 1955 (Illinois State Chamber of Commerce), pp. 31-35. (Mimeographed.)

[20] Roueche, p. 51.

And, in a great many other communities, the people did nothing at all.

Detroit was one of the first communities in Michigan to meet the challenge on a systematic basis. In 1952 Walter I. Meyers, Superintendent of Landscape and Forestry for the City of Detroit, told members of the Michigan Forestry and Park Association,

> It is our opinion at the present time that the number of American elms infected with Dutch elm disease will gradually rise for a period of about five years. Our thought is to keep this rise at a minimum, and it is hoped that at the end of five years it will level off and possibly decline.[21]

At the Dutch Elm Disease Conference of 1960, C. A. Boyer, Chief of the Plant Industry Division of the Michigan Department of Agriculture, listed some reasons why programs in Michigan have failed. First, many communities failed to realize that money must be spent either for control programs or for the removal of dead trees. Second, Dutch elm disease programs did not receive the public support due to inadequate education of the public. Third, since officials did not realize that control was a technical matter, there was undue reliance placed on spray programs and too often the work was given to irresponsible supervision and unskilled labor to carry out. Summing up, failure to understand the need for a comprehensive program resulted in a piece-meal failure of many programs.[22]

George Dalby, Superintendent of Horticulture for the Niagara Parks Commission, felt that the greatest stumbling block is public apathy — "why are people indifferent to this program?" He offers a number of suggestions. When the experts seemed to disagree and no masterplan was available, public interest seemed to wane. Officials have tended to emphasize costs of control measures and ignore the ultimate costs of removing the dead trees.

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[21] Walter I. Meyers, "Dutch Elm Disease Fight in Detroit," Proceedings of the 26th Annual Meeting of the Michigan Forestry and Park Association (East Lansing, 1952), p. 13. (Mimeographed.)

[22] C. A. Boyer speaking at Dutch Elm Disease Conference in 1960 (Haskell notes).

Finally, self-styled experts offered "witchcraft cures" and wishful thinkers hoped that "it won't be too bad."[23]

In addition to the public apathy and disorganized thinking deplored by Mr. Dalby, Joseph Dietrich of Greenwich, mentioned that opposition by many organized groups against the use of DDT as a control spray has retarded many town and city programs.[24]

John C. Van Camp, midwestern tree consultant, was the city forester for Rockford, Illinois until he resigned in 1957 in protest to lack of support for the Rockford program.[25] At the International Shade Tree Conference in 1963, he presented a penetrating analysis on the success and failure factors of Dutch elm disease control programs in Illinois between 1955 and 1963. Two principle reasons given were (1) the failure to realize that tax money must be spent in greater amounts and over a shorter number of years where no program exists, and (2) that there is need for competent professional advice. In addition to these causes for failure, he gave the following observations.

1. There is a better chance for long-range programs where there is an established forestry department.
2. Strong leadership in initiating and maintaining a program has been more effective than waiting for an aroused public to demand action. It is the obligation of the city official to take action.
3. The disease can be controlled but not eradicated. Many cities lose heart and interest when they continue to lose trees after following the recommendations. Then they drop the program.

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[23]George Dalby, "Status of Dutch Elm Disease in Canada," Proceedings of the International Shade Tree Conference: 1963, p. 149.

[24]Joseph A. Dietrich, Seventeen Years of Dutch Elm Disease. (Greenwich Tree Department, June 1962), p. 2.

[25]Letter from John C. Van Camp to Theodore Haskell, August 7, 1959.

4. "Sure-cures" and new methods tempt many to drop the tested control measures and losses mount.[26]

Noel B. Wysong, Secretary of the Midwestern Chapter of the International Shade Tree Conference, says that the success of a disease control program depends on the effects of three groups within the area: the scientists; arborists, both public and private; and tree owners including municipalities, highways, utilities and private citizens. The actions of these three groups influence the extent to which a control program may be effective. He stresses the importance of good communications to "spread the word" of the significance, potential damage, etc. of any new disease or insect pest.[27]

In reviewing the accounts of programs that have succeeded and those that have not, there seems to have been no shortage of technical information on the higher levels. If there has been a problem it has been in the area of public relations. Boyer, Dietrich and Wysong stress the need for public relations work. The people must be convinced of the need for prompt action to meet the threat. It is not enough to design a plan for a control program. There must also be decision-making, implementation, and evaluation.

Literature on the Community Action Process

Planning a program cannot be completed without consideration of the whys and hows of decision; without implementation a plan is useless.

Considering the community power structure by which the community "gets things done," there seem to be three significant groups: (1) the community leaders or "influentials," (2) the elected officials or "decision-makers," and (3) the administrators or "professionals" employed by the government to carry on the affairs of the city.

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[26]John C. Van Camp, "Status of Dutch Elm Disease: Outlook in Midwest," Proceedings of International Shade Tree Conference: 1963, pp. 143-48.

[27]Noel B. Wysong, "The Human Side of Tree Disease Control," The Connecticut Arborist, X, 2 (December 1956), 19-23.

Charles Adrian argues that the "community leaders" seem to function as innovators of policy, but he maintains that they have difficulty in implementing policy into effective community action. He feels that they will be faced more often with citizen apathy than with opposition.[28]

However, decision-making within the present urban culture is not a simple matter of community leaders or elected officials making the decisions and the people carrying them out. In his study of the activities of city officials and persons with private influence in the cities of Raleigh, North Carolina and Atlanta, Georgia, Dr. Kent M. Jennings indicated that while the influential group ranked considerably higher in social status, the city officials were just about as important as the so-called influentials in making decisions which involved their specialized fields.[29] Perhaps the limit of the choices open to the influentials are set in large measure by the day-to-day decisions of the city administrators?

In Science and Government, C. P. Snow discusses the interactions of decision-making groups in the construction of the first British radar screen network. He says that much of the critical decision-making was done in what he calls "closed politics" — from which there is no appeal to the electorate or other higher assembly. He gives three systems:

1. Committee politics: action by consensus of committee with support of those committed to group decision.
2. Hierarchal politics: In a highly articulated organization you must convince people at all levels. It is their support — or absence of their passive resistance — which decides whether the strategy goes through in time.

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[28]Charles Adrian, "The Community Setting," Social Science and Community Action (East Lansing: Michigan State University, 1960, p. 1.

[29]Kent M. Jennings, as quoted by Phillip Meyer in news column, Detroit Free Press, September 17, 1962.

3. Court politics: to exert power through a man who has a concentration of power.[30]

How does this "implementation by an elite" fit in with our democratic system? Democracy assumes that all adults should have a right to make their opinions known, and a right to influence decision-making if they feel that they have an interest. Today many of the problem areas are so complicated that the notion that a layman can always know what is best for him is not very logical. From this situation has come the increased dependence on the specialists, the technicians and the professionals who bring the knowledge of their field to bear on the problems. Yet the specialist cannot be given an entirely free hand because most specialists become biased in favor of their special area whether it is horticulture, highways, or downtown parking.[31]

So how should progress best be made in this democracy of ours? The best answer seems to be that democracy requires the decision-makers of a community to (1) hear out all those who see themselves as having an interest in the problem, (2) to give a fair amount of attention to the technical specialists in the field, and then (3) to produce a compromise among the various desires that will work in the short run and not have unfavorable, but preferably acceptable results in the long run — as measured by the values of society.[32]

The phrase "values of society" is a key one. In discussing the process by which community leadership, especially citizen leadership, evolves community decisions, Adrian says,

> Claimed solutions are, of course, not solutions at all unless the prevailing values of the people involved

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[30] C. P. Snow, Science and Government (Cambridge: Harvard University Press, 1961), pp. 56-63.

[31] Frank W. Suggitt, John L. Hazard, and Charles R. Adrian, Land and Water Policies for the Future, General Bulletin No. 4, Institute for Community Development (East Lansing: State Board of Agriculture, 1959), p. 35.

[32] Ibid., p. 36.

> accept them as such. . . . What appears to be a 'good solution' to the efficiency expert . . . may seem useless to the local citizen who may value a certain type of service or certain type of access higher than he does "efficient" government administration.[33]

Whether a man has planted a tree, or just watched it grow, he is disturbed to see it wilt. He wants to talk to someone who can tell him what is wrong. He wants a sympathetic listener and advisor, not an "efficient" form letter from City Hall.

Summary

There are trees in the cities because men planted and maintained them at considerable expense. It would seem, then, maintenance programs with public funds indicate the importance of trees to the communities. The elm is considered to be one of the most beautiful and practical of the urban trees. When the Dutch elm disease threatened this community heritage, the communities responded in many ways. Some were successful in combating the disease, but some were not. It seems to follow that to be successful, a Dutch elm disease control program must be well designed from a technical viewpoint and must be capable of efficient administration. But, it must also fit the value-pattern of the citizens of that particular community. Regardless of the ability of the administrator and his technical staff, and regardless of the relative costs of such a program compared with other city services, unless the people of the community value their shade trees, they will not support a program. If this basic appreciation of value by the community is not recognized and transferred to support of the shade tree program, then, despite an efficient and able administration supported by the governing body, the Dutch elm disease program (or any similar program), will be weakened and usually abandoned.

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[33] Adrian, p. 7.

CHAPTER III

LANSING AS A COMMUNITY

To understand the impact of the Dutch elm disease on Lansing the city must be seen, not as a map, or as a collection of buildings, streets, and real estate, not even as a "social group" of people living close together, but as an ecological community. Charles J. Galpin, a pioneer rural sociologist, was one of the first to emphasize that the relationship of people to the land was the significant relationship. In 1924 he wrote: "The human element in the problem of agriculture and country life is the theme of this book."[1] His notions, that people and their attitudes were important to planning of any kind, formed the basis for his studies on communities. He and others that followed him urged planning based on the attitudes of human beings to the land and the institutions around them, in short, an approach through community ecology.

The history of the city explains the abundance of elm trees and also the early regard of the people for shade trees. As the city grew and the people of Lansing shaped a city from the forests and swamps, they shaped a city government to meet their needs. A problem in the growth called for a tool of government to meet the problem, and in turn the ordinances, policies, and city functions helped shape the approach to further problems of expansion. After several cycles of problems, tools, and specialized approaches Lansing developed the city institutions that exist today. The basic approach to new problems, including the Dutch elm disease, tends to be predetermined by the tools available in the Mayor-Council form of government and the technical specialists in the city departments. The

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[1] Charles J. Galpin, Rural Social Problems (New York: Century Company, 1924), preface.

problem of the Dutch elm disease was met by the efforts of the Department of Parks and Recreation. This professional orientation did much to determine the course of action that was taken when the disease was discovered.

History of the Community

Early accounts maintained that the densest deciduous forests known in the region grew in the Lansing area. "Ingham county forests were denser, its swamps were swampier, its soundless vastness less penetrable . . . few Indian trails and no roads."[2]

The City of Lansing lies in the center of this area, in a shallow bowl formed by rolling hills. The Grand River flows through the city in a wide loop. Sycamore Creek flows up from the south and joins the Red Cedar River a short distance from where it meets the Grand in the center of the city. There is very little fall on the Red Cedar and the Sycamore and both streams loop and twist through an extensive flood plain. Much of this low land is swampy and still covered with elm, soft maples and other swamp species.[3] As the area developed and the land was cleared, first for farms and later for residential development, the well-drained land covered with oaks and maples was chosen first, leaving the sites that supported soft maple and elm. By the 1950's a high percentage of the "wild trees" of the Lansing area were swamp elm types, growing in the most inaccessible and neglected parts of the city.

The first settlement was established in 1837 near the confluence of the Grand and Red Cedar River. In 1847, the State Legislature voted to move the state capital from Detroit, and the decision for Lansing was approved in December 1847. The name was changed from the original "Town of Michigan" to Lansing in 1859.[4] It was incorporated by legislative act

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[2]Mrs. F. A. Taylor, and Mrs. George R. Thornton (eds.), Today and Tomorrow in the Lansing Metropolitan Area (Lansing: League of Women Voters, 1961), p. 54.

[3]Ibid., pp. 7-8.

[4]Harland Bartholomew, The Lansing Plan (Lansing: City of Lansing, 1922), p. 11.

on February 15, 1859 and named for a New York State town from which most of the early settlers had migrated.[5] The city grew slowly around the state capitol and the mills on the Grand River. As the railroads were built, the industry developed and the city began to grow.[6]

In 1878 the City Council passed Ordinance No. 32.[7] This ordinance was to provide for the planting and protection of shade and ornamental trees in the City of Lansing. Many of the early plantings date from this ordinance, and many of the old hard maples are still on the streets.

In 1912, Lansing became a home-rule city under the provisions of the state constitution.[8] On June 14, 1920, the City Council entered into contract with Harland Bartholomew, City Plan Engineer of Saint Louis, Missouri, to prepare a comprehensive city plan report for Lansing. A City Planning Commission was formed on September 7, 1920. One of the active members of the Commission was H. Lee Bancroft, Superintendent of Parks and City Forester.[9]

In the city plan of 1922, Harland Bartholomew listed a number of things to improve the city. It is significant that among this list of improvements were a number that were definitely linked to horticultural values. He was critical of the hit-or-miss development of the city park system and the street tree plantings of the past. He commented that while the native forest trees had "mostly disappeared," there had been many others planted to take their places.[10]

To improve the city in a horticultural way, he recommended the encouragement of more home landscape gardening, stressing the advantages

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[5]League of Women Voters, p. 7.

[6]Bartholomew, p. 11.

[7]City of Lansing, Revised Ordinances (Lansing: W. S. George and Company, 1878), No. 32.

[8]League of Women Voters, p. 7.

[9]Bartholomew, p. 2.

[10]Ibid., p. 13.

to be gained through the use of lawns, trees, and shrubs. He urged more widespread planting of street trees, to be maintained at city expense. Additional plantings should be made when new subdivisions are laid out, and on older streets when improvements, curbs and gutters, are put in. Uniform extensive plantings are to be desired, but will not be secured if left to individual property owners.[11,12]

In the Bartholomew plan the designs of the proposed streets all showed tree plantings as playing an important part of the design.[13]

When Bartholomew returned in 1938, to revise and update the 1922 city plan, he commented favorably on the progress made since 1922. City changes that had been made included 300 acres of new parks (including Groesbeck and Red Cedar golf courses, additions to Potter Park, Scott Field, and many improvements of river banks). Nearly 11,000 street trees had been planted since 1930, and "all this in conformity with the city plan of 1922."[14]

By 1958 the city had grown considerably, and the park and street tree system had grown with it. A period of expansion, by annexation of large areas of Lansing township, had begun in 1949 and was to continue through the period of the study until the city would more than double in size. By 1958 the city had a population of over 115,000 and there were over 155,000 people in the Greater Lansing urban area.[15]

The growth of the city during the period of the study, had a significant

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[11] Ibid., p. 56.

[12] Was this criticism the spur that gave H. Lee Bancroft his first "push"? Certainly, in the years that followed, both the park system and the street tree system showed considerable improvement. Perhaps it is significant that an Assistant City Forester was hired in 1923.

[13] Bartholomew, p. 17.

[14] Harland Bartholomew and Associates, A Report upon the Comprehensive City Plan (Lansing, 1938), p. 13.

[15] Comprehensive Master Plan, 1960-1980: Lansing and Environs (Lansing: Ladislas Segoe and Associates, consultants, 1958), p. 4.

effect on the success of the Dutch elm disease control program. Not only did this expansion mean more elms to protect, but also the disease and the bark beetle-carrier population had been established for a period of several years without any sort of official control measures being taken except for a few state condemnations made during the early years of the study period. The Ingham County Road Commission removed dead trees along the right-of-way, and the township government removed a few dead trees from time to time. However, there was no organized effort and control measures in these areas until they were annexed to the city. By this time the city was faced with a high beetle population and a large backlog of dead elm trees.

The city grew by annexation from approximately 9,646 acres with a population of 92,129 in 1956, to an area of 21,294 acres with 130,398 people by June of 1965. This increase of 11,648 acres more than doubled the size of the city and brought it to a total of 33.27 square miles, with a population increase of 38,269. The final population figures were based on the 1960 census, plus the mergers, plus growth factors over deaths and migration.[16] (See Figure 1 for a map of Lansing showing areas of annexation between 1956 and 1965.)

Lansing Form of City Government

"Americans are by temperament and tradition, distrustful of government in all matters in which the commonwealth is not at stake."[17] Yet, as our society has become more urbanized, more mobile (both physically and mentally), the acts of any one affects the many, and more and more the local government acts in areas for the common interest, that only a short time ago were considered only a matter for individual concern. People have realized that many problems, such as Dutch elm disease, water pollution, or recreation needs, that were beyond the power of the individual to correct, have been possible to solve through community action.

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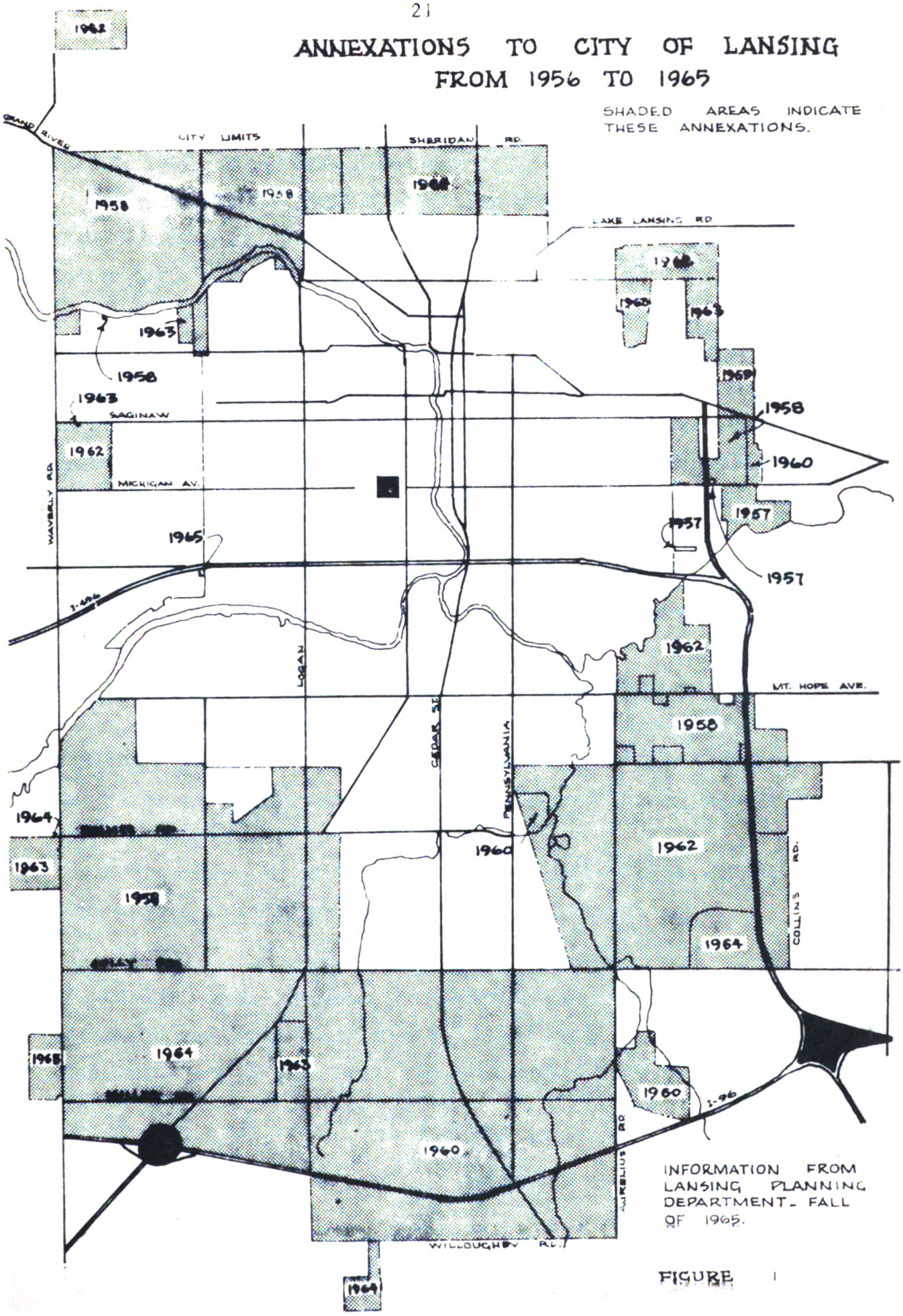
[16] City of Lansing Planning Department, "Annexation," Special Studies Division, October 29, 1965.

[17] League of Women Voters, p. 3.

ANNEXATIONS TO CITY OF LANSING FROM 1956 TO 1965

SHADED AREAS INDICATE THESE ANNEXATIONS.



INFORMATION FROM LANSING PLANNING DEPARTMENT - FALL OF 1965.

FIGURE 1

Lansing presently operates under the "new" city charter adopted in 1955. It was revised from the charter of 1912, and became effective on April 8, 1957. It has been amended three times since 1957.

There is a Mayor-Council form of city government. The Mayor is the chief executive, the Council is the legislative body, and there are two judges in the municipal court.[18]

The City Council of eight members has authority over all city ordinances, rules and regulations of the city, power to confirm or reject the appointments of the Mayor, except the Mayor's executive assistant. Four councilmen are elected at large, and one from each of the four wards. The charter allows the Council to set up standing committees to facilitate making policy decisions. The committee on Parks and Recreation is one of these, and has three members.[19]

The Mayor is elected for a four-year term. He is responsible for the administrative conduct of the city government, and is answerable to the electorate.[20]

All Boards are appointed by the Mayor, confirmed by the Council, and are under the authority of the chief executive. Each Board has an employed administrative head recommended by it to the Mayor. This administrator directs the work of his department. The Park Board has the Director of Parks and Recreation.[21]

By the charter all city operations must be carried on through the budget process, and all funds are appropriated by the Council.

Department of Parks and Recreation

Clearly, there had been a well-defined appreciation for the importance of trees in Lansing for many years before the discovery of the Dutch elm disease. While the first "tree ordinance" dates from 1878, the organization

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[18] Ibid., p. 8.

[19] Ibid.

[20] Ibid., p. 9.

[21] Ibid.

of a specific city department to assume these responsibilities did not begin until nearly 40 years later.

Writing for a Chamber of Commerce tree planting program in 1941, H. Lee Bancroft describes the founding of the forestry program in Lansing.

> More than twenty-five years ago a janitor and a fireman, at the mayor's request, went out to trim a street tree which was hanging low. They returned a short time later ahead of a property owner with a shotgun . . . the city turned in its saws to the Park Board who appointed a City Forester [Bancroft], who drew up an ordinance that was adopted and is still in force.[22]

The forestry program has since been amended to add provisions for Dutch elm disease, boxelders, and traffic hazards. Copies have been requested by other departments and have been sent to many other cities.

Bancroft stated the basis for the program as

> . . . costs for trimming or planting are cheaper on a street by street basis than on an individual basis . . . our funds come from general taxes and every taxpayer has something to show for his investment, which is growing more valuable to his property each year.[23]

The first action of the new department was pruning and shaping small trees, removal of old, planting new. Later budgets included feeding, disease and insect control.[24]

By 1953, Carl G. Fenner was able to confirm the original rationale of the department purpose in preserving and extending the street programs of Lansing.

> It was reasoned and has proved to be true that trees could be trimmed, sprayed, repaired, old ones removed and new ones planted in a more uniform manner at lower

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[22] H. Lee Bancroft, Article (no title), written in August 1941, in connection with tree planting program.

[23] Ibid.

[24] Carl G. Fenner, "Factors Affecting the Street Tree Program Budget," Paper given at Iowa State College, February 20, 1941, pp. 1-5.

> cost, if administered through a municipal department equipped to do such work.[25,26]

The operations were and still are financed by annual appropriations from the general fund through the Park Board budget.[27] This method of financing had an important effect on street tree policy. Fenner explained that since the tax revenues came from residential and business property in approximately equal proportions,[28] the per tree cost for residential street trees was low. Considering the small cost to the average homeowner, the policies have been based, first, for the improvement of the street plantings as a whole, and second, for the desires of the individual property owner.[29]

The old city charter (1912) provided for a Park Board of eight members, one from each of the eight wards. Describing the advantages of this system, Fenner wrote that the board members were,

> . . . appointed by the Mayor and confirmed by the Council, serve without compensation for overlapping four-year terms. Actually, our members serve for life unless they move out of their ward.[30] This system assures a continuous and long range program, planning, and operation of the department and a secure FOUNDATION for uninterrupted progress.[31]

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[25] Carl G. Fenner, "A Modern City Forestry Program," Arborist's News, XVIII, 2 (February 1953).

[26] The equipment factor is a key one. Since 1945 equipment is bigger, better, and so much more expensive that only a large organization can property take advantage of the combination of skilled men and specialized equipment.

[27] Ibid.

[28] In 1965 the General Property taxes made up 48.8 percent of the General Fund of the City. The residential property tax represented 42.6 percent of the property tax, or approximately 20.8 percent of the General Fund. (Records of City Assessor, Lansing, Michigan, 1966.)

[29] Ibid.

[30] This pattern changed in 1957 when four members were appointed from the four wards, and four members-at-large. It changed again in 1961 when Willard I. Bowerman was elected mayor. While Bowerman made new appointments

The Board appointed the Superintendent (now Director under the 1955 Charter) who in turn works with the Board in the selection and development of the departmental staff, including the City Forester who has the responsibility for shade tree care on the streets, parks, cemeteries, and golf courses.

These operations were based on three principles:[32]

1. A sound, uniform, but flexible tree policy sensibly administered.
2. Good quality workmanship carried out in a diligent, quiet manner.
3. The ability and willingness to discuss sincerely, tactfully, and intelligently, all phases of work under consideration. Full consideration of the property owners' views, consistent with solid forestry practice.

The departmental programs in the years preceding the Dutch elm disease were established on a foundation of technical competence combined with a sensitive public relations program.

Of the technical policies developed during these early years the most significant to the Dutch elm disease problem was the tree planting policy and program. Fenner described the background to the program as beginning with the "original planners and first residents." They were very tree conscious and diligently planted the streets of the young town to native varieties[33] from the surrounding forests: oak, elm and hard maple. The second stage began about 1890 when rapid expansion created many new developments. These tree plantings were from eastern nursery firms — cheap and unsatisfactory — soft maple, poplar, catalpa, and boxelder. Their only policy was "quick shade." By 1915-1925 perhaps two-thirds of the streets were planted; the remaining one-third were new and unplanted.[34]

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to the Board as two terms expired each year, Lansing did not reach the situation found in many cities where board members resign en masse when a new mayor takes office, regardless of provision in the charter for overlapping terms.

[31] Ibid. [32] Ibid. [33] Ibid., p. 13.

[34] Fenner, "Factors Affecting Budget," p. 2.

In 1930 a systematic planting program was started with trees planted at city expense. Elm, hackberry, and sycamore were planted on streets with parkways (between the walk and curb) of six feet or wider.[35] This diversified planting program dispersed the elm plantings around the city so that control measures for all disease and insect pests were easier to operate. Another advantage of this farsighted policy of "diversified planting" was that only 20 percent of the street population in 1956 were elms.[36]

The Department of Parks and Recreation developed its street tree program largely as a result of the efforts of two men: H. Lee Bancroft and Carl G. Fenner. Without their initiative and persistent efforts the impact of the Dutch elm disease would have been far more serious.

The program was from the first a systematic program, conceived, planned, and implemented on a scientific basis by men with a professional approach to the problems. This approach involved experience, research, and the exchange of information within the community and with other professionals on a nationwide basis. This information was systematically recorded and integrated into policies and procedures of the department. From this approach came a program which considered not only immediate and short-range needs, but also reached into the future to insure the meeting of long-range goals for the community.

During the years of the study, there were four men with responsibility for the program that had professional training in forestry. In addition to H. Lee Bancroft, 1915-1957; Carl G. Fenner, 1923-1962; there were Theodore J. Haskell, 1949-1966; and David Phillips, 1957-1966. Each of these men contributed to the program through his background training experience and professional recognition. Charles G. Hayden, 1957-1966, did not have a forestry background. However, he made significant contributions

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[35] Carl G. Fenner, "Standards of Policy and Practice," revised 1954, Manuscript of departmental talk, illustrated with slides and used in visual education programs, p. 11. (Typewritten.)

[36] Departmental Annual Report, 1956.

in the area of political implementation and budget administration during his years as department head.[37]

A significant factor in maintaining the high standards set in the early days of the department was the program of in-service training by which not only the policies, procedures, and standards of good shade tree practice were developed, but the abilities and all important attitudes were passed down from man to man. Shortly before his retirement in 1962, Carl Fenner wrote

> . . . for the last fifteen years I have poured my soul into the job of training young, devoted, honest, competent forestry graduates — five of them — to be good tree doctors. Two of them are now in other cities. Three of them . . . [are still here] are doing their best and are successful. Give them criticism if they deserve it and your support when they deserve it . . . and try to get my point of view when I say bluntly, but sincerely, that I have trained these men to show no partiality.[38]

These, then, were the men that conceived, planned, and implemented the program for the control of Dutch elm disease in Lansing during the ten years from 1956 to 1965. Their principal tools were the skilled men and specialized machines of the forestry division. Under their guidance and administration the division grew steadily in an attempt to cope with the many problems.

The forestry staff and work crews grew from three salaried supervisors, two foremen, nine tree men and two laborers on a full-time basis, supplemented by 14 to 20 seasonal tree trimmers and laborers in 1958,[39] to a projected organization for 1966 of five salaried supervisors, four foremen, 12 tree men and equipment operators, and seven laborers on a full-time

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[37] See Appendix for biographical summaries of these key administrators.

[38] Letter from Carl Fenner to Phillip Walters regarding a request for service, June 27, 1962.

[39] Departmental Records, March 18, 1958.

basis, supplemented by 21 seasonal tree trimmers, Dutch elm disease scouts and laborers.[40] Chain saws, trucks, and other equipment including mist sprayers, stump chippers, two hydraulic aerial towers, and, in 1965, a hydraulic loading crane were added during the same period of time.[41] See Figures 2 and 3 for the present crew organization for the forestry division.

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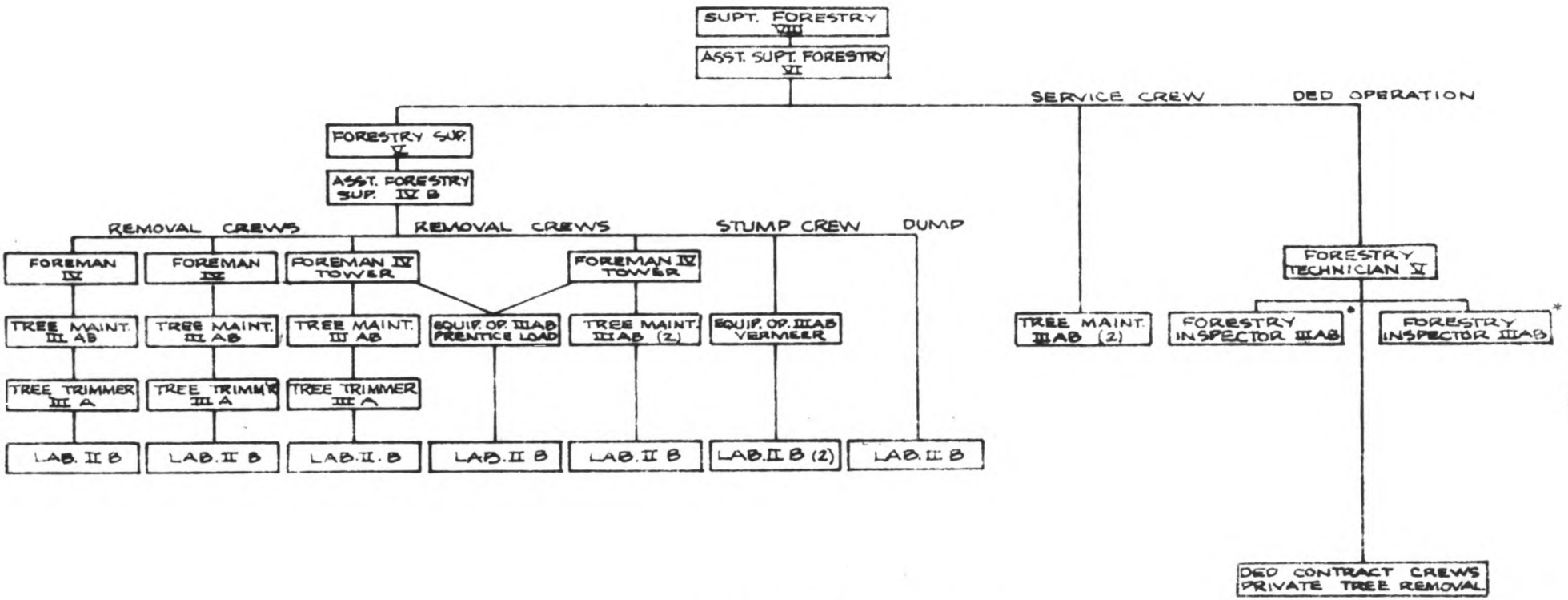
[40] Departmental Records, 1965.

[41] Departmental Records, and Reports to the Park Board, April 1963, January 1965.

WINTER OPERATION

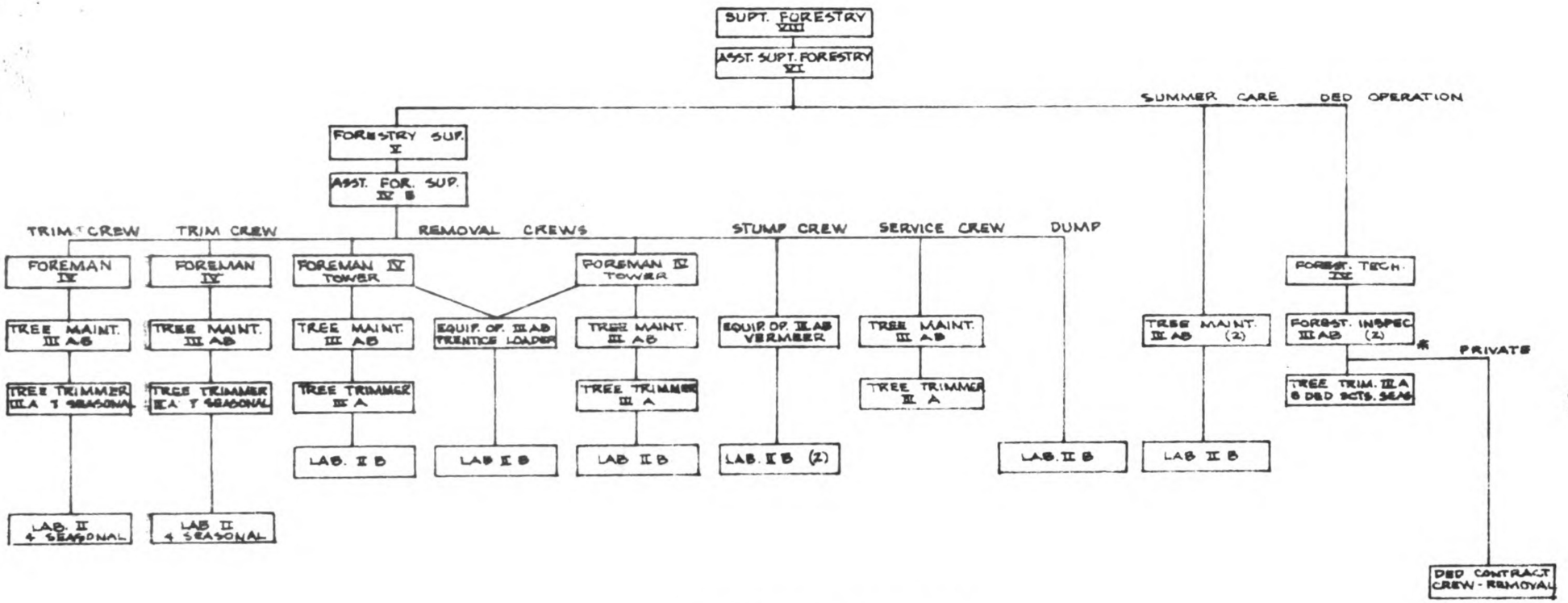


FORESTRY DIVISION
DEPARTMENT OF PARKS AND RECREATION
LANSING, MICHIGAN

FIGURE 2. FORESTRY CREWS: WINTER

* APPROVED 1966

SUMMER OPERATION



FORESTRY DIVISION
DEPARTMENT OF PARKS AND RECREATION
LANSING, MICHIGAN

FIGURE 3. FORESTRY CREWS: SUMMER

* APPROVED 1966

CHAPTER IV

THE DUTCH ELM DISEASE

In order to understand the impact of the Dutch elm disease on Michigan and the city of Lansing in particular, it is necessary to consider the nature of the disease and how it is spread, the general history of the disease in the United States and Michigan, and the evolution of the principal technical control measures. These basic control measures were tested, modified and adapted by the forestry staff to meet the needs of the Lansing program.

Nature and History of the Disease

The Dutch elm disease is a vascular disease caused by a fungus known as Ceratocystis ulmi.[1] It affects all of our native elms and European elms.

The fungus is spread from tree to tree in two ways. The most common way is by tiny bark beetles. There are two kinds of bark beetles.[2] One is a native (Hylurgopinus rufipes) but the most effective carrier, the smaller European elm bark beetle (Scolytus multistriatus) arrived in this country as early as 1905.[3] These beetles over-winter as grubs in the bark of an unhealthy elm tree or recently cut logs or firewood. As the adult beetles crawl out through the bark they may carry the spores of the fungus on their bodies. When they fly to healthy elm trees to feed, the spores enter the tree through the feeding wounds in the upper twigs. (See Figure 4 for life cycle of beetles.)

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[1] Pascal P. Pirone, Bernard O. Dodge, and Harold W. Rickett, Diseases and Pests of Ornamental Plants (3d ed.; New York: Ronald Press Company, 1960), p. 700.

[2] W. E. Wallner and John H. Hart, Dutch Elm Disease Control, Extension Bulletin 506, Farm Science Series (East Lansing: Cooperative Extension Service, Michigan State University, May 1965), pp. 2-3.

[3] Curtis May, "History of the Dutch Elm Disease," Control of Dutch Elm Disease, Proceedings of Statewide Conference, November 10, 1955 (Chicago: Illinois State Chamber of Commerce), p. 5. (Mimeographed.)

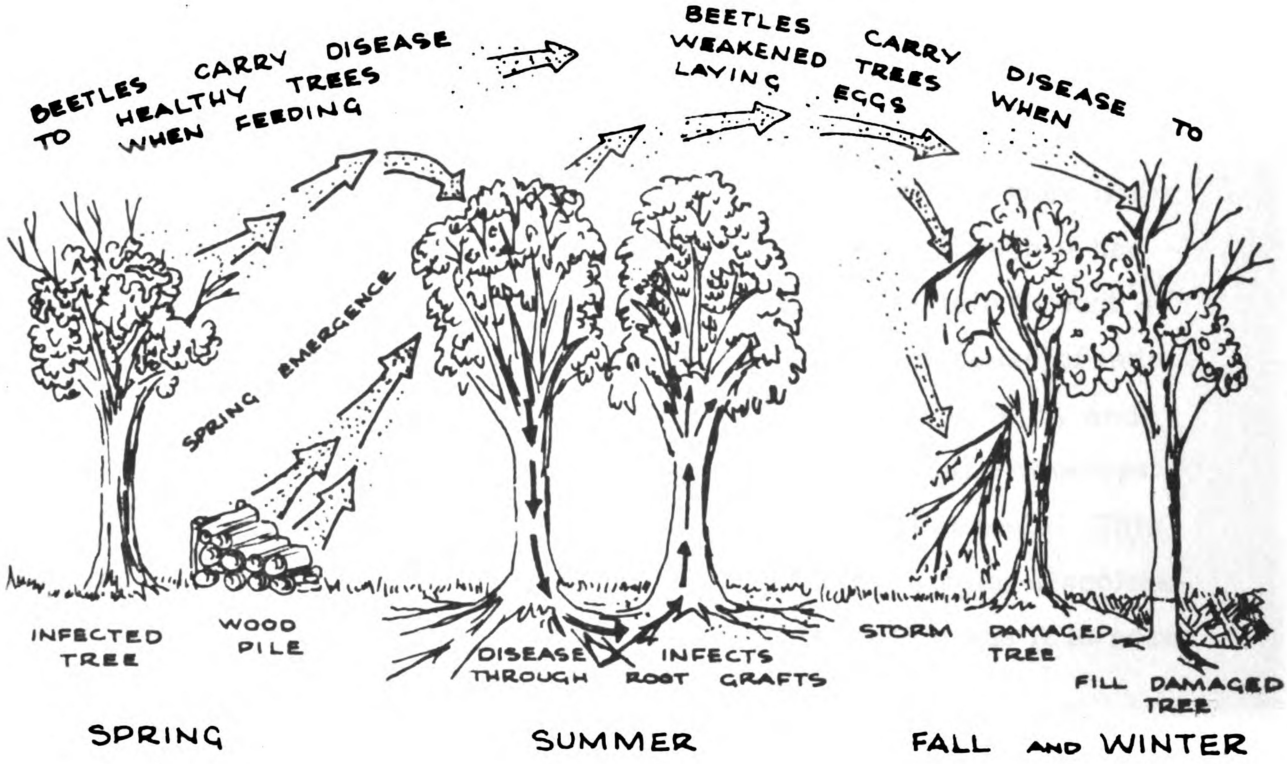

FIGURE 4

SPREAD OF DISEASE WITHOUT CONTROL PROGRAM

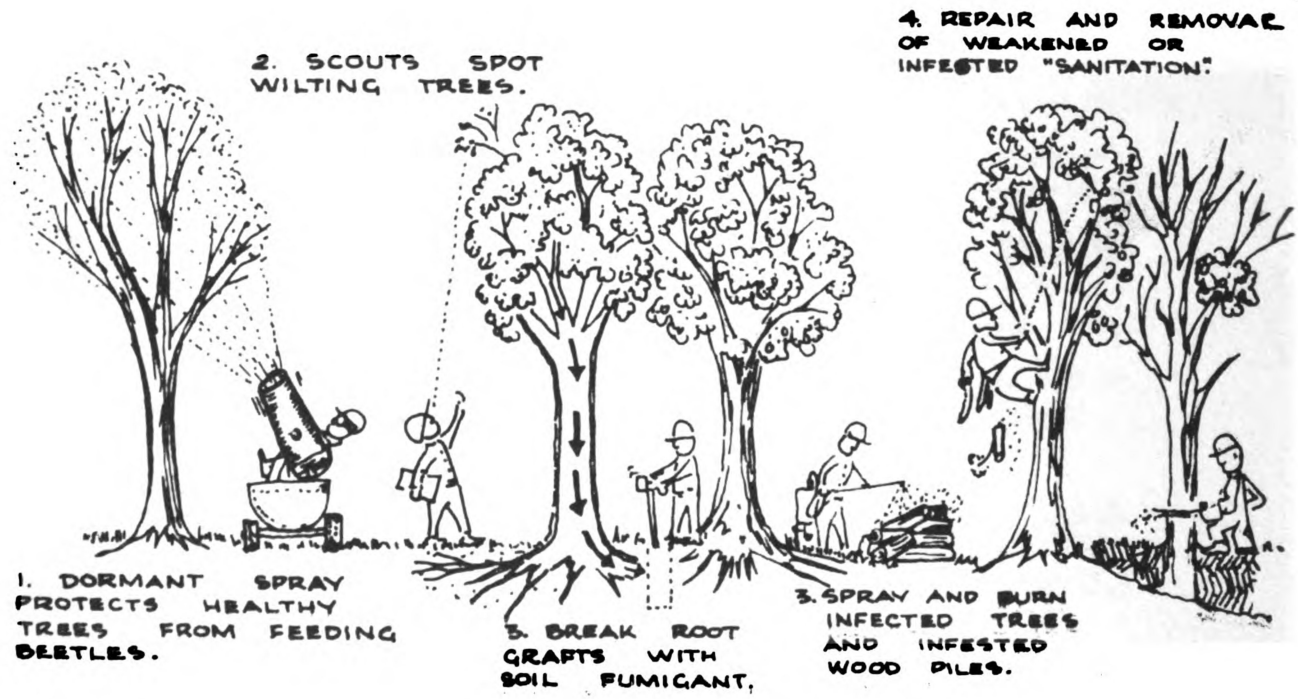

FIGURE 5

HOW CONTROL PROGRAMS BREAK INFECTION CYCLES

The disease may also pass through natural root grafts from diseased trees to healthy trees growing nearby.[4]

The first symptoms are a wilting, curling and yellowing of the foliage, usually high in the tree. This "flagging" may appear on one or more limbs and is often visible at a distance. The tree often looks as though it had been scorched by a nearby fire. The fungus may spread rapidly through the tree and kill it in a few weeks. Other trees, whether because of individual growth pattern or other special factors, may wilt more slowly and die slowly over a period of one or more years. Brown streaking develops in the sapwood and is one of the best symptoms for field diagnosis. This streaking cannot be taken as final proof, however, since similar discoloration is found in several other diseases. To determine which one it is necessary to make a laboratory test.[5]

History of the Dutch Elm Disease

The disease was discovered in Holland beginning in 1918 by pathologists from Baarn, Holland. Dr. Schwarz first identified the fungus as Graphium ulmi. It was found to be widely spread through Europe and it was felt that it probably came from Asia during World War I. The resistance of Asian elms seems to confirm this hypothesis.[6]

While the Dutch elm disease began killing elms in Europe in the 1920's, there was little definite information or protective action taken until the

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[4]Ray L. Janes, Forrest C. Strong, and John H. Hart, Dutch Elm Disease Control, Extension Folder F-195 (4th rev.; East Lansing: Cooperative Extension Service, Michigan State University, July 1963), pp. 3-6.

[5]J. Cedric Carter, Illinois Trees and Their Diseases, Illinois Natural History Survey Circular 46 (Urbana: Natural History Survey, 1955), pp. 61-62.

[6]Curtis May, "History of the Dutch Elm Disease," Control of Dutch Elm Disease, Proceedings of Statewide Conference, November 10, 1955 (Chicago: Illinois State Chamber of Commerce), p. 2. (Mimeographed.)

disease was found in Ohio in 1930.[7] Even then the questions as to how it arrived and spread went unanswered. In 1933 more diseased trees were found in New York and New Jersey.

Then a federal inspector who had read of the new disease intercepted some veneer logs in Baltimore:

> The trail starting with one log in Baltimore led to records on over 500 logs shipped into this country over a nine-year period from 1925 to 1934. They came in at four ports and 16 railroads carried them 13,000 miles through 21 states. The logs were cut into veneer or processed at 13 locations in nine states.[8]

These were apparently the source of infections in 13 areas in seven states.

For about seven years during the depression they tried to <u>eradicate</u> the disease. That failed — the real reason being that you cannot eradicate a disease transmitted by insects. However, this work did delay the spread and reduce the intensity of the invasion. During the years of World War II the European elm bark beetles spread slowly into the midwestern states, their progress was marked a few years later by an increased number of dying elm trees. During this time the spray application of DDT was found to be effective in preventing inoculation by feeding beetles and technical specialists added the third technical control measure to control programs.

Dutch Elm Disease in Michigan

When the first case was discovered in Detroit in 1950,

> Immediate action on the part of city foresters, civic groups, and law enforcement agencies resulted in the initiation of a cooperative program between Michigan

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[7] Carl Fenner, then Assistant City Forester of Lansing, saw this tree as part of the programs of the 1930 National Shade Tree Conference held in Cleveland.

[8] O. N. Liming, "Tracking Down a Foreign Invader — The Dutch Elm Disease," <u>Trees Magazine</u>, VIII, 4 (May-June 1948), 6-7.

communities and the Plant Industry Division of the Michigan Department of Agriculture.[9]

The initial program involved the Michigan Department of Agriculture, the United States Department of Agriculture, Michigan State University, and the University of Michigan. There was an educational program to supply the communities with facts on the problem and plans were made to survey certain areas of the state to determine the extent of the invasion.[10]

One of the key figures in the Michigan program was Forrest C. Strong, Associate Professor of Botany and Plant Pathology, Michigan State University. As a teacher he had explained the symptoms of the Dutch elm disease to his students for years before the disease was found in Michigan. As a research scientist, he set up the first identification laboratory in Michigan. This laboratory on the Michigan State University campus processed thousands of the samples taken in the early years and served to train many technicians in the methods of identification and diagnosis.

Professor Strong was active in the educational program and the annual programs given each year to shade tree professionals and community leaders. In setting up these programs in Lansing and East Lansing, Professor Strong always provided a balance between the technical work of the scientists and the administrative work done by the professionals in the field. In 1960 he commented, "It seemed that the hammer, hammer from so many practicing foresters who are on the firing line . . . made a better impression than any of the other talks given that day."[11]

In Michigan the overall coordination of programs came from the Plant Industry Division of the Michigan Department of Agriculture. Following a time-tested strategy for dealing with insect pests and plant diseases, the

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[9] Plant Pest Control Annual Report, 1965 Plant Industry Division, Michigan Department of Agriculture.

[10] Letter from C. A. Boyer to Carl Fenner, Assistant City Forester, October 19, 1950.

[11] Forrest C. Strong, Letter to Theodore J. Haskell, December 21, 1960.

Division had sent trained men to observe the Dutch elm disease in the eastern states.[12] They worked directly in the field "with men who are concerned and who have first hand experience."[13] Lansing followed a similar procedure and in recent years have passed such "first hand experience" on to others.

Since there was no direct cure for the fungus, the main control measures were directed against the elm bark beetle. The habits of the smaller European bark beetle indicated two ways to control it:

1. To prevent or reduce feeding (spraying trees).
2. Reduce the beetle population by eliminating the kinds of elm required for breeding (sanitation).[14]

As the disease spread north and west through Michigan the demands on the Plant Industry Division grew. Requests not only for educational programs, but requests for survey work and samples for laboratory testing grew from hundreds a year to thousands. To insure a fair distribution of available funds the Plant Industry Division drew up a set of standards for community programs. Those communities which decided to follow the recommendations were designated as "control zones" under Regulation No. 613 as amended.[15] This required a "program for the control of Dutch elm disease, such program to consist of both sanitation and spraying for vector control in accordance with the Michigan Agricultural Experiment Station."[16]

The standards also required a civic agency to be responsible for the

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[12] C. A. Boyer, speaking at the Dutch Elm Disease Conference in 1961. Notes by Theodore Haskell.

[13] C. A. Boyer, speaking at the Dutch Elm Disease Control Conference in 1960. Notes by Theodore Haskell.

[14] Russell R. Whitten, "Transmission of the Disease," Control of the Dutch Elm Disease (Chicago: Illinois State Chamber of Commerce, 1955), p. 10.

[15] W. Stanwood Cath, "State Assistance in Disease Control," Michigan Municipal Review, March 1963, p. 58.

[16] Ibid., p. 57.

program; an ordinance that involved disposition of trees on private property, "perhaps the most important tool the community possesses"; city supervision over contract spraying; provision to assist the needy with removal of condemned trees; responsibility for a greater portion of the survey work and provision of facilities for the disposal of elm wood.

Timing of a community program seemed to be a critical factor. In 1963 Fred B. Knight, Associate Professor, Forestry Department, School of Natural Resources, University of Michigan, emphasized that control must be started early. If 25 percent to 50 percent of the elms are already gone, the beetle population will be so high that it will be difficult to protect the rest. Losses on this scale might be termed the "crisis stage."

If all the elms died in a few years the costs could be very high. He follows the New York emphasis on sanitation and says that while sanitation should be supported by a spray program, if economies are needed, the spray should be eliminated first. He recommends that no control program be started if the "crisis stage" has been reached since a program must be sustained once started, or the money will be wasted. He concluded his recommendations with advice for more diversified use of tree species to replace the dead elms.[17]

The basic justification for starting a systematic control program is summed up by R. P. Marshall, Director of the Bartlett Tree Research Laboratory:

> The cost of giving an elm tree complete control treatment[18] over a period of 15 years may be less than removing the tree after it has died. . . . In one New England city hundreds of fine old elms have been stricken . . . the cost of removing them has been estimated conservatively at $400,000 — yet a program

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[17] Fred B. Knight, "Factors Which Affect the Control of Dutch Elm Disease," Michigan Municipal Review, March 1963, p. 56.

[18] As a private tree man Marshall includes two foliar sprays to control leaf-eaters, regular feeding, and pruning of dead limbs.

of $400,000 spent over 15 years might have kept most of them alive for decades to come.[19]

History of the Dutch Elm Disease in Lansing

While the Dutch elm disease had been discovered in Detroit in 1950, it was not until 1956 that the first diseased trees were confirmed in Lansing. During the early 1950's the forestry staff used the basic techniques of research, and the exchange of information with those in first hand contact with the problem to prepare a preliminary plan. The city was surveyed in 1954 and again in 1955. These surveys were conducted in cooperation with the Plant Industry Division of the Michigan Department of Agriculture. The experienced Dutch elm disease scouts came into the city and aided the Lansing staff in learning the symptoms and proper techniques for taking samples for laboratory testing.[20]

With the discovery of nine infected trees in 1956, the city shifted from the pre-infection program to the active phase of the control program.[21]

As the disease became established in the surrounding countryside there was an annual increase, except for 1963, in the incidence of the disease.[22] Table 1 shows the number of trees condemned: public trees, private trees and annual totals.

The first two years of the program spraying was limited to the "danger areas" surrounding the actual infection points where trees had been condemned. An educational program was devised to urge private property owners to spray their own elm trees through contract with private tree service firms. This was released through the news media and stressed that this was something that the owner could not do for himself, but that

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[19]R. P. Marshall, "We Can Save Our Elm Trees," Trees, VIII, 1 (November-December 1947).

[20]Report to Park Board, April 13, 1955.

[21]Report to Park Board, August 8, 1956.

[22]Department Dutch Elm Disease Report for 1965, p. 7.

one spray application a year was cheap insurance to protect a valuable tree. A city-wide survey was planned for late winter (1959) to locate elm wood piles or other elm wood infested with beetles.[23]

Table 1. Elm Trees Condemned for Dutch Elm Disease: 1956-1965

Year	Total Positive	City Positive	Private Positive
1956	9	7	2
1957	8	3	5
1958	66	23	23
1959	218	41	177
1960	508	177	325
1961	989	255	734
1962	1,570	340	1,230
1963	901	145	756
1964	2,308	312	1,996
1965	3,544	695	2,849
TOTALS	10,115	1,998	8,117

Source: Departmental Dutch Elm Disease Report, 1965, p. 7.

In 1960, the department was still making two complete surveys a year. The losses were again highest in the newly annexed portions of the city. A contributing factor was the extensive home building program that made drastic changes in the natural environment and favored the build-up of the bark beetle population. The 1960 reports also indicated increased infections in the "fringe areas" around the city.[24,25] Since there was no control

[23] Report to Park Board, October 8, 1958.

[24] Report to Park Board, August 10, 1960.

[25] "Fringe area" was defined as 1/4-mile strip inside the city limits around the perimeter of the city. Departmental Dutch elm disease report, 1963.

program operating in the areas of the township, high beetle populations built up. As a result, the trees in these fringe areas were particularly exposed to infection.

Perhaps the outstanding problem over the years has been the result of annexations. The department forestry program extends services into new areas on a phase basis; the most urgent having the highest priority. Storm damage and Dutch elm disease control were the first services "phased in." Due to the menace of the Dutch elm disease, every elm in the Pleasant Grove and Horsebrook areas was surveyed in the summer of 1958.[26]

In 1959 the problem of the newly annexed areas remained critical. During 1958, the ratio of infected trees ran approximately two private trees to one public tree; by 1959 the ratio was running at three private trees to one public tree. Losses were high in the Pleasant Grove area where many private elms had been neglected.[27]

In 1959 losses in the annexed areas represented 52.3 percent of the total and in 1960 they represented 39 percent of the total city loss. Street tree losses reached an annual rate of 3.7 percent of the population while in the "old city" the rate was only 1.4 percent in 1961 (see Figure 6).

Losses in the annexed areas in 1961 were reported at 26 percent from the North School area, 31 percent from Pleasant Grove-Horsebrook, representing 57 percent of the loss for the entire city.[28]

While the rising losses were discouraging on first consideration, the comparison between the "old city," where there had been a control program from 1954, and the annexed areas shows a decided difference. The street tree losses for 1961 were still less than 2 percent compared with loss rates of 8 percent to 10 percent where cities had no control programs.[29]

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[26] Report to Park Board, August 1958.

[27] See Figure 3, Report to Board, July 8, 1959.

[28] Departmental Dutch Elm Disease Report, 1961.

[29] Departmental Dutch Elm Disease Report, 1961.

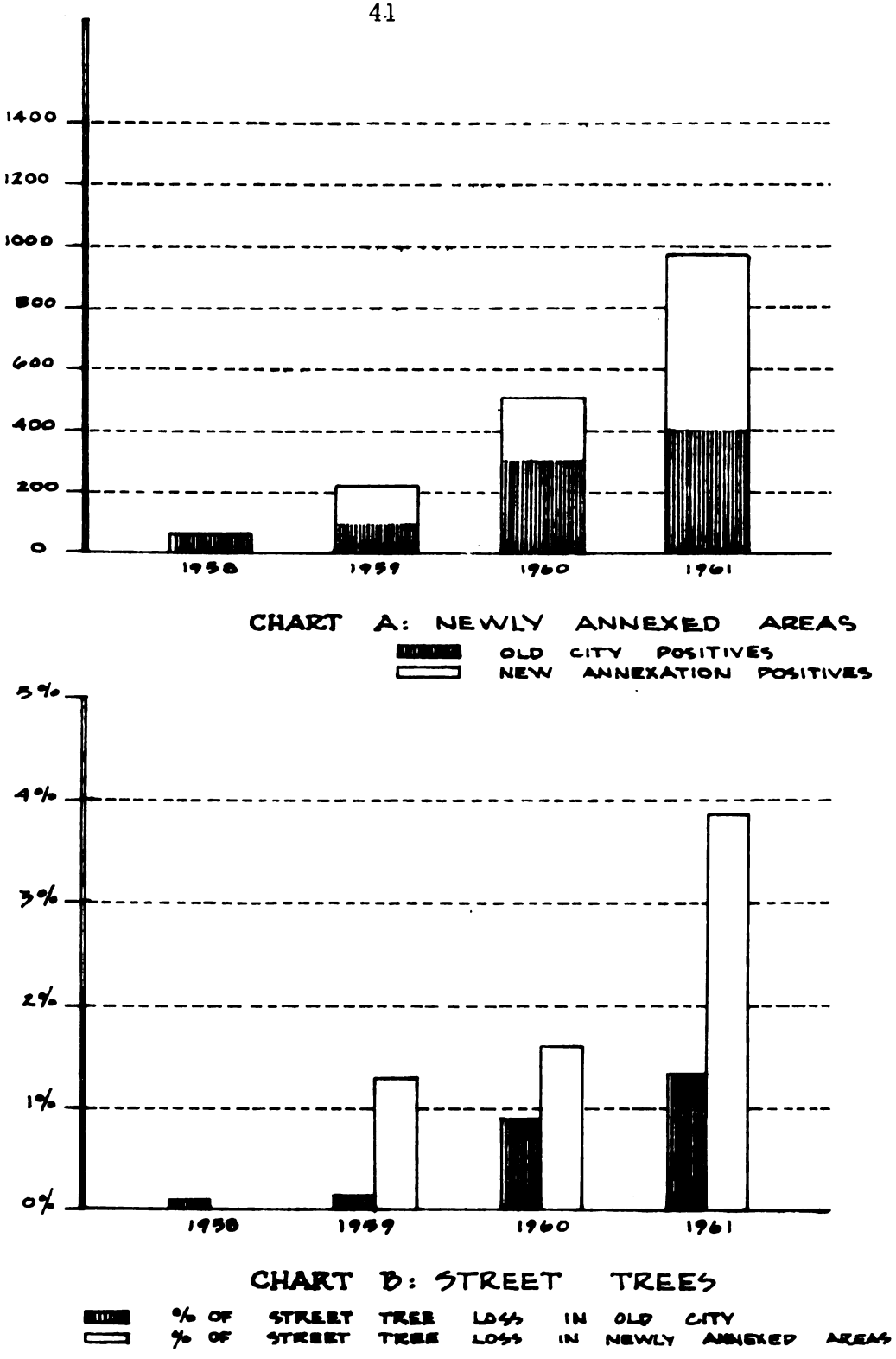

Figure 6. Elm Losses in Annexed Areas

Forestry Division, Parks and Recreation Department, City of Lansing.

In 1962, ". . . to effectively evaluate our control measures and make a better projection for Dutch elm disease control," the department divided the program records into Program A and Program B.[30] Program A included the high-value city elms that were sprayed; Program B included the low-value public elms and all of the private sector elms. (See Figures 7 and 8.)

In 1963, the number of diseased trees condemned decreased. The decrease in dying trees was substantial. Not only did the losses of program decrease, but there were fewer trees condemned on private land. This was encouraging and the professional staff, Park Board, and City Council hoped that the turning point predicted by Meyers and others had been reached. In 1964, however, the losses again increased sharply. (See Table 1, page 39.)

Study of the situation suggests two theories; one of natural causes, the other of administrative causes. It is likely that the decrease could have been caused by a combination of both sets of circumstances.

J. G. Matthysee of Cornell University reported that:

> A high incidence of Dutch elm disease can be expected in a year with warm spring weather. If the time of the early flight coincides with the spring vessel development and no summer development, a high degree of Dutch elm disease can be anticipated. If the beetle emergence is fairly late because of cool weather and the trees have laid on spring wood and some summer wood, then the probability of the disease is low.[31]

It is possible that such a combination of natural factors in the spring of 1963 resulted in lower losses from 1,570 to 901. Flint records also show a decrease, from 1,031 to 659.[32] Ann Arbor did not record a decrease,

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[30] Departmental Dutch Elm Disease Report, 1963.

[31] J. G. Matthysee as quoted by Joseph Dietrich, "The Outlook in an Old Dutch Elm Disease Area," Proceedings International Shade Tree Conference: 1963, p. 132.

[32] City of Flint, Forestry Department Report, February 2, 1966.

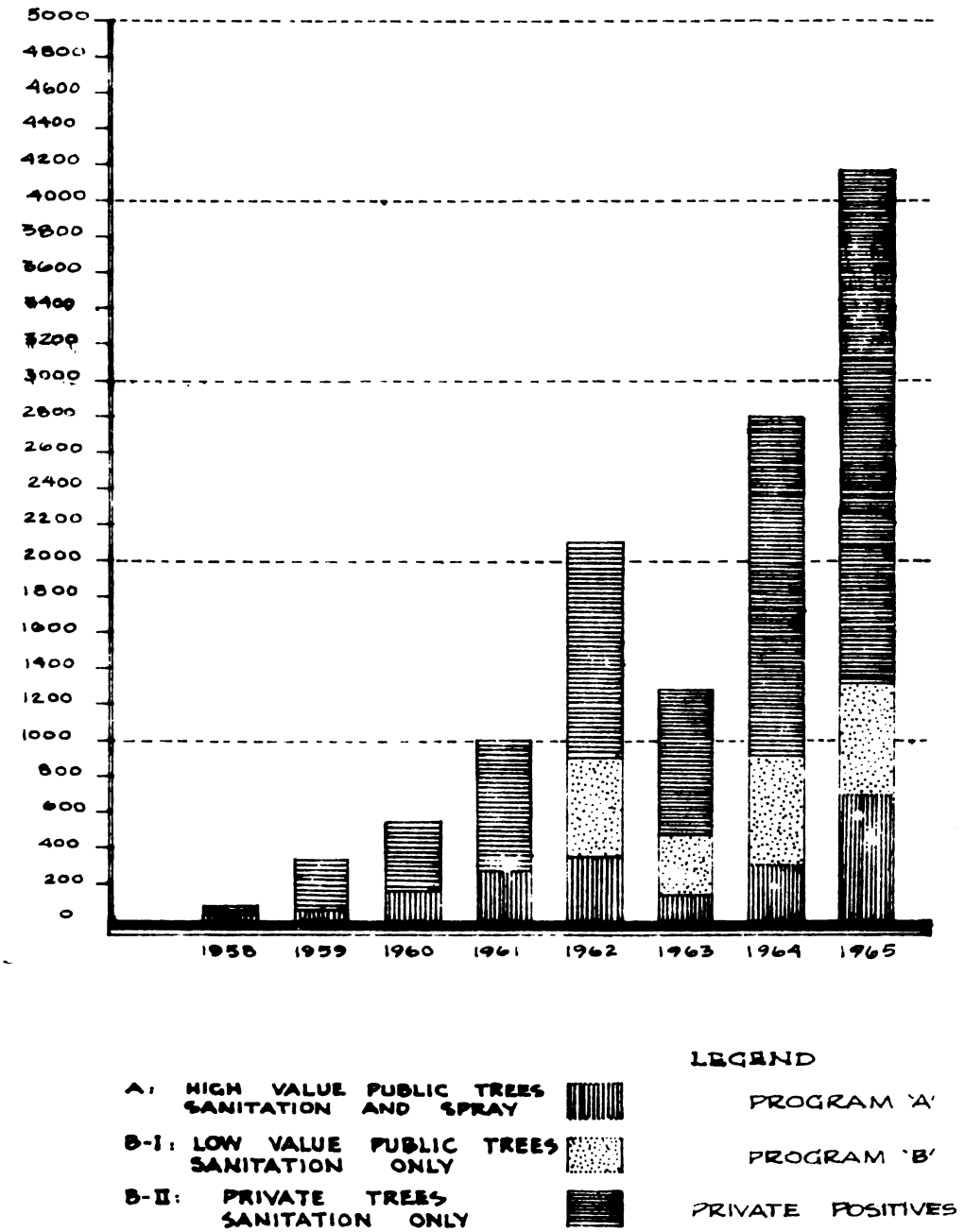

Figure 7. Dutch Elm Disease Program Elm Losses

Forestry Division, Parks and Recreation Department, City of Lansing.

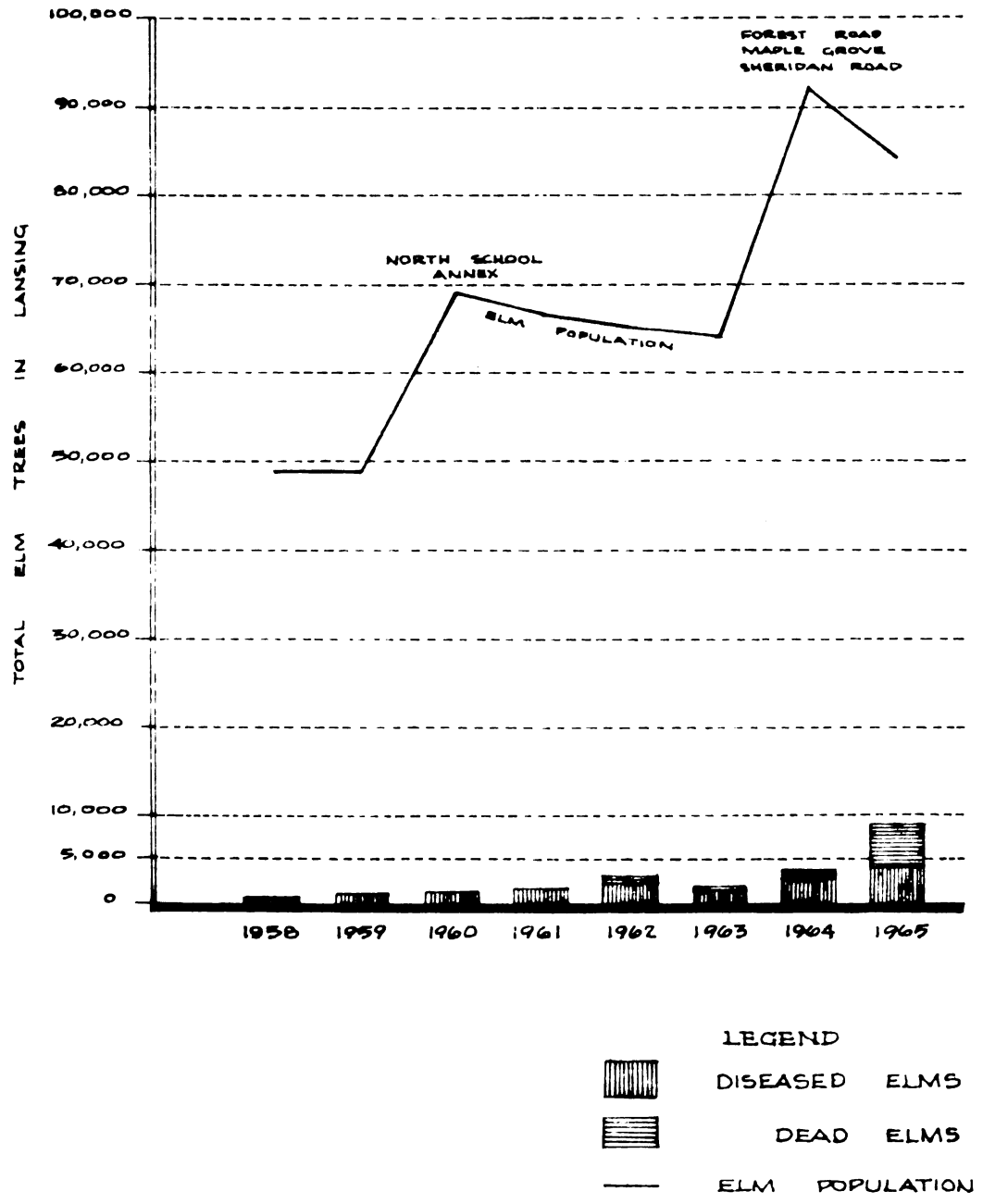

Figure 8. Dutch Elm Disease Program Elm Losses

Forestry Division, Parks and Recreation Department, City of Lansing.

but losses were only 700 in 1962 and only 711 in 1963.[33] Jackson, however, experienced an increase at about the same rate as in the past.[34] Obviously a more intensive study would have to be made before a definite correlation could be established with the weather cycles.

The administrative causes relate to changes in personnel. In 1962, Carl Fenner retired as Director. Charles Hayden replaced him, and Theodore Haskell, City Forester, had been promoted in November to Assistant Director while retaining the responsibilities of the forestry division. In the budget request of 1963-64, reclassifications to a higher salary level were requested for Louis Atkins, Assistant Forester, and David Phillips, Forestry Technician. These reclassifications were not approved and when Phillips was offered a position with the Plant Industry Division, he accepted and left the department March 29, 1963. After considering several job openings, Atkins accepted a position with the Plant Industry Division, and left the department on July 19, 1963.[35]

As a result, in the heart of the scouting season, the supervisory staff was cut from a base of 160 hours to approximately 60 hours. By working overtime and giving extra responsibility to some of the less experienced but responsible tree men, the department continued until replacements were hired in the early fall. In a situation of this sort, the established procedures are usually followed without the usual close attention to possible changes in the work situation. Trees may have been missed by the scouting patterns that were not counted until the following year.

These two theories illustrate that control programs will always have some vulnerability to forces and decisions that operate outside the program, but extend their effects into the operation of the program.

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[33] City of Ann Arbor, Park Department Report, March 1966.

[34] City of Jackson, Forestry Department Report, January 2, 1966.

[35] Departmental Records, 1963.

In 1963, David Phillips, Forestry Technician, prepared a five-year report on the history of the disease. Discussing the problems, he noted that new subdivisions were definite problem areas. Grading, changes in drainage, and new construction caused large numbers of trees to be weakened and become more susceptible. (Breeding of beetles increased under such conditions and the beetle population became very high in these areas.)[36] As these areas are cleared of dead and dying elms the control program should be more successful. He noted that the heaviest concentrations still continued to be found in woodlots and fringe areas. One such "fringe area," bordered on three sides by derelict woodlots, contained 33 percent of the total losses of the 1962 season.[37] The annexations of 1959 and 1960 (see Figure 1, page 21) added a total of 3073 acres of land including 24,354 more elms and 151 acres of highly vulnerable fringe area. The disease had been established in these areas since 1958 and no control program had been in effect.[38]

This pattern was continued from 1963 through 1965. Though the excitement of meeting a new challenge was gone, the problems remained. Vigilance and persistence were needed more than ever as each spring the scouts sought out the dead and dying trees. When new areas were annexed they were surveyed and included in the operations planning and budget preparation.

The technical problems of the basic control measures were largely solved and the solutions tested by experience. Administrative and public relations problems, however, increased as the size of the program went from trees by the hundreds to trees by the thousands, and as more and more people became personally involved.

Many of the problems were of a financial nature. Budget preparation

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[36] Departmental Dutch Elm Disease Report, 1963.

[37] Ibid., p. 3.

[38] Ibid., p. 5.

and budget administration of the program became more involved as the budget items became larger. The past history of Dutch elm disease budget requests has followed this pattern. (See Table 2.)

Table 2. Budget Appropriations and Transfers for Dutch Elm Disease Accounts, 1956-1965

Budget Year	City		Private		Total
	Budget	Transfer	Budget	Transfer	
1956-57	. . . no special funds in budget . . .				
1957-58	$ 20,000	$ --	$ 2,500	$ --	$ 22,500
1958-59	10,000	--	500	+ 1,750	12,250
1959-60	15,000	--	3,250	+ 3,500	21,750
1960-61	28,000	--	10,000	+10,000	48,000
1961-62	32,300	- 1,488	20,000	+ 2,600	53,412
1962-63	35,000	+ 2,800	25,000	+ 2,000 - 2,000[a]	62,800
1963-64	40,000	- 4,000	15,000	--[b]	51,000
1964-65	35,000	+26,700	7,000	+59,000	127,700
1965-66	60,000	+41,575	70,000[c]	--	171,575
TOTALS	$275,300	$ 65,587	$153,250	$ 76,850	$570,987

Average cost for ten-year period $57,098 per year.

Source: City of Lansing Budget Records, 1956-1965.

[a]An additional $2,000 was transferred in to cover expenses but was not used.

[b]This year of $30.00 deductible share policy change.

[c]This year of $50.00-50 percent share policy change.

1. Estimate request on possible increase over past year was determined by department staff from past records and application of present policies to projections.
2. Following budget hearings with the Mayor and City Council, the Council appropriation has been made largely on the basis

of the departmental request and the past year's budget history.

3. As the impact of the current season became evident, the department requested additional funds and/or policy changes to continue the operation. Unencumbered funds did not carry over, but were reappropriated the following year.
4. Council authorized budget transfers from contingent funds or in recent years, from other departmental accounts. In all cases where changes in policy were necessary an effort was made to make them at the beginning of a given operating season which would coincide with the fiscal year July 1 to June 30.

Cures

From the beginning there have been those who wished for an easier way to protect their trees. Something that did not require the skill, equipment, manpower or money demanded by the recommended programs. Others, located helplessly outside control zones, welcomed almost any alternative to giving up their trees. Two such "alternatives" received wide publicity, not only in the press but through the "grape vine" of letters and conversation. In 1960, many people asked about the zinc-chloride and galvanized (zinc coated) nails. In an article clipped from the Joliet Spectator, Games [sic] Slayter emphasized "that while these methods have not actually been proven effective, results indicated . . . other tree owners give it a try."[39] This cheap and easy method of boring holes or pounding nails was exactly what many people had been waiting for and the word spread fast.

The more recent method was featured in Robert Pearson's column in the Detroit Free Press. It featured a retired judge who had devoted his retirement to fighting the "mysterious combination of ills known as Dutch elm disease." His method involved watering, about 20 gallons per week; scraping the roots and packing with lime; and pouring six tablespoonfuls

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[39]Letter with Clipping from Joseph Coleman to Theodore Haskell, October 31, 1960.

of epsom salts over the roots twice a month.[40] (The water might do some good but the scraping could open the roots to soil fungii.)

As these claims were checked out they have proved to be largely ineffective as far as saving the infected tree was concerned.

In 1962, the Freers Company wrote the City Council about their formula "for arresting and possibly curing the Dutch elm disease." The letter was referred to the City Forester for investigation. His letter, reporting to City Council, summed up the Department policy as of that date.[41]

> Briefly, there have been many "cures" announced over the years, but none have prevented, controlled, or cured the disease. The major problem is that standard procedures have not been used, the time has been limited to one season and the "infected" trees have not been verified by laboratory tests. In the summer of 1961 the International Shade Tree Conference approved a set of standards for testing any such cures. The Lansing program will continue to follow the State recommendations with the assurance that when a reliable cure is developed, the department will be informed and can change the program to take advantage of it.[42] [See Appendix D.]

Research

One of the dangers of the so-called "cures" is that they tend to distract from the efforts of real research into the problems. Research has followed three principle lines: search for resistant varieties of elms, improved chemicals to fight the fungus and the beetles, and biological controls to cut down the beetle population.

Perhaps the best known of the resistant[43] elms is the "Christine

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[40] Robert Peterson, "Retiree Uses Time to Save Elm Trees," Detroit Free Press, July 16, 1965.

[41] The policy still stands in 1966.

[42] Letter from Theodore J. Haskell to Mayor and City Council, March 19, 1962.

[43] This ordinarily means that while the tree can be inoculated with the fungus, and so cannot be called immune, it rarely becomes infected naturally, and will survive in areas where many other elms die.

Buisman" elm, a variety of the European smoothleaf elm Ulmus carpinifolia. It is highly resistant, but is susceptible to elm leaf beetles, grows more slowly than the American elm, and is not reliably hardy in cold areas such as Minnesota or northern Iowa.[44] However, it has done well in Flint, Michigan. According to William Ruth, City Forester, the Buisman elms have been hit by heavy feeding by the beetles, but Flint has lost only one dead and a few branches out of another.[45] The foliage is green and glossy, the shape is not the distinctive vase-shape of the American elm, but seems to make a good street tree with the typically rounded habit of U. carpinifolia.[46]

Like most of the Asiatic elms, the Hansen Manchurian elm is highly resistant. Zelkova serrata is also resistant. This tree is being used in Lansing to replace elms that have been lost on predominately "elm streets."[47]

Chemical controls have come a long way since Joseph Dietrich began his experiments with DDT.[48] In addition to testing of methoxychlor and other surface sprays, intended to coat the tree with insecticide, considerable research has been done with the systemics. These chemicals are injected, or otherwise released, into the sap stream and move upward through the tree to control the fungus itself (fungicides) or the bark beetles (insecticides).[49] Perhaps the best known of the systemics is Bidrin developed by the Shell Oil Company.

The Lansing Parks and Recreation Department sent Jerome Allen, Assistant Superintendent of Forestry, to the training school. He worked with

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[44]Pirone, Dodge and Rickett, p. 702.

[45]Conversation with William Ruth at Meeting of Central Michigan Foresters, September 11, 1964.

[46]Donald Wyman, Trees for American Gardens (rev. ed.; New York: Macmillan Company, 1965), p. 469.

[47]Pirone, Dodge and Rickett, p. 702.

[48]Dietrich, International Shade Tree Conference, 1963.

[49]James Butcher and William E. Wallner, "Some Will Survive," Michigan Conservation, XXXV, 2 (March-April 1966), p. 12.

a number of experimental trees during 1965 but results were inconclusive. In another experimental area, twelve formulations were tested in cooperation with the Entomology Department of Michigan State University. None proved as effective as the present spray program and all appear to be more expensive.[50]

What is needed for a municipal control program is a technique that is (1) cheap, costing less for material and labor over the years than cost of removal of the tree if it dies; (2) can be applied over a considerable period of time so that the trained employees can be used without excessive overtime charges; (3) safe for both the employees, the residents, and the trees; and (4) can be applied without the use of costly equipment. There is hope that further refinements of these systemics will eliminate some of the present dangerous side-effects and allow the real potential of such methods to give control of not only the elm bark beetle, but aphids, scale, canker-worms, and other pests.

Early results with new materials often look promising, but there is a period when any new material must move from the laboratory testing of a few trees to large scale applications involving thousands. Often problems develop and research results are conflicting. In view of such conflicting research reports the Michigan Department of Agriculture has held up commercial use of Bidrin in Michigan for at least another year.[51]

Other chemicals used in new control methods include Vapalm, a soil fumigant, to control spread of the disease from tree to tree by root grafts; Sodium arsenite and Potassium Iodide to control beetle breeding in dying trees.

Vapalm is mixed with water and injected into the soil to kill the roots by contact. This forms a barrier-zone between an infected tree and adjacent

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[50] "Annual Report of the Forestry Division: 1965" (Lansing: Department of Parks and Recreation, 1965), p. 6.

[51] Theodore J. Haskell, "New Controls for Dutch Elm Disease," Michigan Municipal Review, January 1966, p. 5.

trees. When trees are close together this is the only way of preventing the chain-reaction that can spread down an entire fence row regardless of the amount of spraying done to the outside of the trees. It is also relatively cheap and can be handled without expensive equipment. (See Figure 5, page 32.)

Control in woodlands, river bottoms and other hard-to-reach areas can be improved through use of chemicals to prevent beetle invasion to lay their eggs. Sodium arsenite was first used, but Potassium iodide is safer and more effective. Application into frills cut into the bark prevents beetle invasion so that the trees may be cut at a more convenient time or even, in the case of wood lots, left standing.[52]

Biological controls are also being studied. Michigan State entomologists are currently investigating two species of parasites that attack the elm bark beetle in Europe. If they can survive the Michigan winters these tiny wasps could be the answer to the problems of the woodlot, the river bank and the swamp elms. James Butcher, Michigan State entomologist, writes that "at present we have only partial answers. In dealing with things like trees, parasites, fungii and beetles, we are at the mercy of an everchanging natural world."[53] Nevertheless, research is worth supporting for it is only from the systematic study of the everchanging natural world that men can frame the proper questions and search out the answers to the problems they face.

Summary

The Dutch elm disease, then, is a tree-killer with the potential of a forest fire. The combination of a highly susceptible native tree, an effective carrier with no natural enemies, and finally, the organism that causes the disease has been a deadly one. Since there is no direct cure for the

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[52] J. C. Carter, "A Basic Approach to the Dutch Elm Disease Problem," Proceedings International Shade Tree Conference, 1963, p. 124.

[53] Butcher, "Some Will Survive," p. 12.

disease, the control efforts center on spray programs to keep the beetles from feeding and sanitation programs to keep them from breeding in weakened trees. Community activity seems to be essential and the program must be started in time to be effective at a cost that the community can afford to pay. When the disease was found in Michigan in 1950 the Plant Industry Division and the universities took immediate action to provide the communities of the state with the necessary technical information.

During this period, Lansing organized to meet the Dutch elm disease and after two surveys in 1954 and 1955, the disease was discovered in 1956. With the exception of 1963, the number of infections increased each year according to the predicted pattern and the program was stepped up through scouting and increased spraying to meet it. A major problem developed when the city annexed large areas of suburban fringe including thousands of dying elm trees. The forestry staff continued to expand and refine their control program, adding emphasis to budget administration and public relations as the program grew. Even though costs continued to rise, the Mayor and City Council continued to sustain the program through a careful evaluation system of fund allocation and policy change when the situation required such action.

Throughout the program there have been numerous claims for "cures." While these offer hope to many people in search of a simple answer to a complicated question, none have proved to be an effective substitute for the programs based on scientific research. Research is continuing in a number of new areas and includes work with resistant trees; improved chemicals — systemics, soil fumigants, and herbicides to control bark beetles; and biological controls.

CHAPTER V

EVOLUTION OF POLICY AND PROCEDURE

During the period of the study, the control program was sustained by a basic system involving various techniques of scouting, spraying, and sanitation (in short, a technical approach to the control of the disease and the bark beetles), combined with public relations, evaluation and other administrative procedures that kept the Park Board, Mayor and City Council, and the interested citizens of the community informed as to the functioning of the program.

In an attempt to define the key factors of this system and establish the lessons to be learned, first consideration will be given to the basic goals of the control program. Then each of the principal techniques will be examined in terms of (1) specific rationale, and (2) evolution of procedure.

Basic Goals

Basic Rationale

Dutch elm disease is a community problem. The wider the "control zone" the better the results will be. Citizen cooperation is essential, not only to support the budget-makers of the council, but to care for their own trees and follow the guidelines established by the city or town.[1]

To obtain this kind of community support some sort of preliminary goals must be defined. Such a preliminary "plan" should include:

1. Objective: what is to be done?

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[1] Ray L. Janes, Forrest Strong, and John H. Hart, Dutch Elm Disease Control, Extension Folder F-195 (4th rev.; East Lansing: Cooperative Extension Service, Michigan State University, July 1963).

2. Legal Authorization: the right to do it with public funds.
3. Resources: labor, equipment and materials.
4. Method of Financing: how is it to be paid for?

The Objective. In 1955 the objective was set. The Dutch elm disease was a recognized tree killer and since the department was charged, by ordinance, ". . . to take such measures as may be deemed necessary for control and extermination of insects, pests, and plant diseases which may affect trees on streets, parkways or boulevards,"[2] there was no question of the need to take prompt action to oppose the disease.

The Legal Authority of the tree ordinance. The Park Board and City Forester drew primary authority through the City Charter to the Michigan Law giving cities the authority to acquire and maintain parks.[3]

In the specific area of the Dutch elm disease, further authority derives from the State of Michigan. Under Dutch Elm Disease Regulation No. 613, May 1, 1951, under existing Plant Pest Act No. 72, P.A. 1945, the Plant Industry Division is given the responsibility to enforce Regulation No. 613 in Dutch Elm Disease control areas,[4] ". . . and operate the disease identification laboratory.[5]

While this state regulation has applied to the condemnation of infected trees since 1951, many cities took additional steps under the police power of the city, in the form of new ordinances, to give the foresters power to work directly with the people. In 1956 the forestry staff proposed that the City of Lansing take similar action.[6] By January, 1957, the additional sections to the Lansing ordinance were drafted.[7] The original draft of the

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[2]City of Lansing, City Tree Ordinance and Park Rules (Lansing: Board of Cemetery and Public Park Commissioners, May 1915), Section 2.

[3]State Law Reference C.L. 1948, Sec. 117.4e(1).

[4]Communities that apply a dormant spray and carry out a sanitation program.

[5]Plant Pest Control Annual Report, 1965.

[6]Report to the Park Board, August 17, 1956.

[7]Haskell notes, January 22, 1957.

ordinance followed the customary pattern for nuisance ordinances, and provided for assessment of full costs against the property. The City Council deleted the assessment provisions and appropriated a special fund of $2,500 to be used for this purpose. It was their feeling that this being a problem of the community as a whole, the cost could be spread against the general funds.[8]

The Resources available included the professional staff, the technicians, and the skilled employees of the department. The basic forestry equipment was readily available and was supplemented by additional purchases as better tools and materials were developed.

The Method of Financing followed the basic policy of the department, that tree programs were best financed from the general fund of the city, without special charges to the property owners. This method continued with regard to the public trees, but the increase in numbers of diseased trees forced changes in policy to share a portion of the costs on private property with the owners.

Basic Procedure

With these legal tools as a base for action, the department was able to proceed. The initial position was "one of watchful waiting": a preinfection sanitation program, a tree count of all elms on private land,[9] and a program of public education as to the nature of the problem and the basic rationale: To oppose the Dutch elm disease by all available means. If the Dutch elm disease should sweep the city unopposed it would cost far more than a control program. "Based on 1955 removal costs, it could cost over half a million dollars for removal, and the trees would be gone forever!"[10]

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[8]Letter from Theodore Haskell to James Oates, City Arborist, Richmond, Virginia, September 14, 1959.

[9]Evaluation is best done in terms of percentage of a base population. This count also established the potential vulnerability of the city.

[10]Report to the Park Board, April 11, 1956.

When the Dutch elm disease was discovered, the active program went into effect:

1. All wilting trees to be sampled and sprayed.
2. Condemned trees to be cut and burned.
3. Series of news articles and public meeting scheduled.
4. Additional city ordinance needed.[11]
5. Infection points planned and dormant spray planned.
6. Complete records to be kept to serve as a basis for future operations.[12]

Thus the early plan was soundly based on scouting, sanitation, public relations, spraying and administrative evaluation in that priority. With a few modifications this program went into effect. The people were informed, the tree count was made and operations maps constructed, condemned elms were removed, the trees were sprayed, and cost estimates were prepared and revised on the basis of experience. Men were trained and equipment purchased as the program expanded to meet the increasing losses.

In 1960, Haskell spoke at the State Conference on Dutch Elm Disease:

> Our control program developed slowly as the disease built up in Lansing. We feel that we have been able to develop a better program, and have a better idea of our capabilities by using this phase method of control.[13]

As the years passed the elms began to die by the thousands in the county areas outside the control zones: 1962 — over 3,000 elms in Ionia County;[14] 1963 — Ingham County has over 6,000 elms dead on the county roads;[15] 1965 — removing blighted elms costs Ingham County $66,000 for

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[11] See pages 55 and 56.

[12] Ibid.

[13] Theodore Haskell from a paper presented at the State Dutch Elm Disease meeting, December 12, 1960.

[14] Detroit Free Press, October 15, 1962.

[15] The State Journal (Lansing), October 9, 1963.

5,100 trees on streets and primary roads;[16] 1966 — Allegan County now has 15,000 dead elms and the lowest bid near $600,000.[17] In 1964 the department further defined the basic goals along the lines suggested by Harold C. Miller, State University College of Forestry, Syracuse.

> Our program (heavily based on sanitation) costs money but no program at all would cost more. . . . We have no illusions about our program. We don't expect it to save the elms. It isn't, in the real meaning of the word, control. It's more like a rear-guard action. But we do expect to preserve them — most of them — for a good many years to come.[18]

From the beginning, Lansing had attempted to minimize losses and continue to fight the disease and bark beetles with the best methods available.[19] More specifically, the present goals are: (1) protect the public and private safety from the menace of dead and dying trees, and (2) preserve the aesthetic values of the elms in the community. (Compared with the present situation in the township and out-county areas, the program is worth continuing.)[20]

It may help to visualize decision making on control programs of this sort, as that of finding an acceptable point ranked somewhere between a "minimum program" i.e., hazard removals only, and a "maximum program" in which all phases of spraying and sanitation are carried out by the city at the expense of the general funds.

Policies and procedures are worked out by extensive research and long conferences, but once agreement is reached and the policy or procedure is tested and becomes functional, it should be reduced to a clear, concise statement in written form. By formalizing patterns of procedure, duplication and overlapping are eliminated and differences are more easily

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[16] The State Journal (Lansing), April 13, 1965.

[17] Interview with C. A. Boyer, March 24, 1966.

[18] Howard C. Miller as quoted by Roueche, p. 52.

[19] Haskell, "New Controls for Dutch Elm Disease," p. 4.

[20] Departmental records, July 1965.

reconciled. These procedures materials may be used in the training and orientation of administrators, technicians, and employees in implementing the policies and operations. This system insures better communication with less chance of misunderstanding, and provides a record of the decision.

Scouting

Scouting Rationale

Scouting is the base upon which the control program is built. In Lansing the surveys started two years before the first infected trees were found. The first survey work should determine the approximate numbers of trees that may be involved. Maps can be used as they were in Brookline, Massachusetts[21] or in Lansing. Brookline used a map with colored dots to mark the distribution of the disease, Lansing used colored pins in the same way and marked maps in red (almost all elm), orange (elm mixed with other species) and green (no elm) to indicate the potential threat of the disease in various parts of the city. This sort of a system makes the scouting records available for planning spray and sanitation programs.[22]

Scouting Procedure

The Lansing scouting techniques were set up on the recommendations of the educational meetings attended by the staff. Trained personnel, nct volunteers, were carefully trained in the techniques of recognizing symptoms, taking and preparing samples for shipment to the laboratory, and marking the trees and properly identifying the location on the records. Sanitation scouting for wood piles and dead elms was scheduled for early spring so that the "Beetle-wood" could be eliminated before the spring emergence. Surveys to locate wilting trees were timed to follow the period of beetle emergence.[23]

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[21] Daniel W. Warren, "The Brookline, Massachusetts Program," Proceedings 2nd Conference, Essentials of Dutch Elm Disease Control (Chicago: Illinois State Chamber of Commerce, 1956).

[22] This became unwieldy as the program increased but worked very well in the early years of the program.

[23] Haskell, Dutch Elm Disease Report, 1960.

In the beginning the dead elms and wood piles were noted by the scouts and turned over to the state for condemnation. In 1964, Section 23-18 of the ordinance was amended to allow city condemnation on the first inspection. This eliminated duplication of effort.[24]

The previously noted annexation of suburban fringe was increased by 8.83 square miles between 1962 and 1964. Many of these areas included heavily infested woodlots and undeveloped farm lands. With limited time available for scouting, a decision was made to deviate from the established geographical sweep and not penetrate the woodlots until the first survey of the residential areas was completed.[25] This is an example of how policy and procedure must be modified to meet changes that originate from outside the control of the department.

In 1965, the City of Lansing manual for Dutch elm disease was completed. This manual gives the authorization for the program and the "policies and procedures for field activity necessary to accomplish objectives."[26] This official policy statement is supplemented with the informal field manual, "Inspection and Record Keeping Procedures," prepared by the forestry staff. Plans have been made to put a force of six scouts and two supervisors into the field in 1966. While this phase of the program cost nearly $30,000 in 1965, it is essential that it be done well. Accurate survey work, including careful identification and recording of suspected trees, is the basis for the rest of the program.

Sanitation

Sanitation Rationale

In terms of a Dutch elm disease control program, sanitation means keeping all old and dying branches pruned out, removing elms that have

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[24] Departmental Report, 1964.

[25] Ibid.

[26] "Manual of Operations," City of Lansing, Chapter 340.2, "Dead and Dutch Elm Diseased Tree Removal Field Operations," 1965.

died or are in low vigor from insect attack, flooding, soil fills, lightning, ice storms or anything else that weakens a tree before the bark beetles can breed in them.[27] Even if the eggs are laid the grubs can be destroyed if one of the following measures are taken:

1. Peel the bark.
2. Bury at least six inches deep.
3. Chip with a brush chipper.
4. Spray with DDT or other insecticide in 1 percent oil spray.[28,29]

Originally, sanitation was the only control method available. The disease spread rapidly from 1933 to 1940. The only really effective period of intensive sanitation was from 1938 to 1940. During this time, losses dropped from 18,000 in 1938 to 11,000 in 1939, to 4,000 in 1940.[30]

Infection occurs on healthy trees from feeding of beetles, hardly ever from breeding.[31] Contamination of weakened trees and woodpiles occurs through the breeding activities of the bark beetles. Most feeding activity occurs within a few hundred feet of breeding sites; however, beetles may fly as far as two or three miles to lay their eggs.[32]

These distance factors were used to establish the concept of "protective zones" used in the early "invasion phase" in Lansing and other cities. If a given infected tree lies 500 feet from the source of the infection, beetles from that same source may be spreading around the larger circle up to 1,000 feet in diameter. Prompt spraying of healthy trees within

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[27] Janes, Strong, and Hart, p. 8.

[28] Ibid.

[29] In addition to the above methods many communities that are able to burn in special dumps, do so. Lansing has been able to use this method.

[30] Richard Campana, "Sanitation for Dutch Elm Disease Control," Essentials of Dutch Elm Disease Control, Proceedings of 2nd Statewide Conference (Chicago: Illinois State Chamber of Commerce, 1956), p. 10.

[31] Recent research in Detroit, 1965, indicates that this may be a more critical item than Campana indicated.

[32] Ibid.

this area may protect them. Sanitation efforts should be concentrated within the area to eliminate the source. Once the disease has been established, the number of overlapping zones make such a plan impractical.[33] Campana cites some Connecticut and New York studies on the distance factor and probability of infection if the diseased tree is allowed to stand until the spring emergence of bark beetles.

> It was found that the chances of infection of an elm at 25 feet from an isolated diseased tree were 6 in 10; at 50 feet, 3 in 10; at 100 feet, 1 in 10; at 350 feet, 1 in 100; at 500 feet, 1 in 500; and at 1,000 feet, 1 in 10,000.[34]

He states that while sanitation should be 100 percent successful it is not possible under most circumstances to eliminate all breeding sites.[35] This is in agreement with Donald Welch of Cornell.

> Eradication failed because the idea was founded on a false premise, the assumption that if the last diseased tree could be found and destroyed, the spread of the disease could be stopped.[36]

While this early campaign did not work, there were many benefits including good publicity leading to additional research. Research found that the beetles could spread the disease across country from wood pile to wood pile without needing wilting trees as a link. The Cornell control recommendations were based on the fact that most infections of healthy trees occurred within a few hundred feet of breeding sites. Previous elimination of such wood could prevent these outbreaks.[37]

Removal of such "beetle wood" is more difficult when the native woodland contains a high percentage of elms than in areas where oak or maple forest types predominate, or where there are no wild trees at all as in the prairie states.

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[33] Ibid., p. 16. [34] Ibid., p. 18. [35] Ibid.

[36] Donald Welch, "The Cornell University Program," Control of Dutch Elm Disease, Proceedings of Statewide Conference (Chicago: Illinois State Chamber of Commerce, 1955), p. 25. (Mimeographed.)

[37] Ibid., p. 27.

Costly as sanitation programs may be, the alternatives are even more costly if the beetles are allowed to build up. Five-year losses in the Champaign-Urbana area for trees lost to Dutch elm disease and phloem necrosis cost $213,950 for 4,279 trees at $50 each.[38]

Between 1950 and 1962, Detroit spent $2,000,000 on its control program. In the same period other communities lost 65 to 95 percent of their original elm population. Detroit estimated that their loss could have been 55 percent or 220,000 elms. Removal alone could have cost $13,000,000 and at a value of $200 per tree, $44,000,000 more. A total cost to the community of $57,000,000 for no program compared to the $2,000,000 actually spent.[39]

Even after the decision has been made to conduct a program, there are many difficulties. One of the most serious is the matter of trees on private land. The major problem is who should bear the expense? If the property owner is required to bear the full cost there is the double problem of getting private work done, or collecting if the city did the work.[40]

The Greater Toledo Municipal League found that in 39 cities surveyed, 22 did have a program including trees on private property. In 13 cities the property owners paid the full cost, but in the nine others the city shared the cost with the property owner.[41] This seems to reflect the concept that such a disease is a community problem and as such, at least a part of the cost should be borne by the general fund.

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[38] J. C. Carter, "The Champaign-Urbana University of Illinois Situation," Control of Dutch Elm Disease (Chicago: Illinois State Chamber of Commerce, 1955), p. 36.

[39] Frank Vaydik, Remarks from Proceedings of International Shade Tree Conference: 1963, p. 157.

[40] "Dutch Elm Disease Control — A Survey of Municipal Practices," Greater Toledo Municipal League Research Report No. 110, November 5, 1962, p. 6. (Mimeographed.)

[41] Ibid., p. 7.

Sanitation Procedure

Since sanitation is basically good tree maintenance, the program for the public trees of the "old city" has been good, but the number of private elms and the new annexations have made an overall sanitation program difficult.

The trimming and removal of dead and dying city trees has been handled in a routine manner by city crews. More men and equipment have been added as the number of infected trees increased. The main changes in policy and procedure have come in the removal of trees on private land.

The first action was the establishing of a special section of the Paulson Street dump for burning elm wood of the community. This was announced as a special meeting sponsored by the department for all private tree operators. The response was good. The basic idea was "you get it there and we'll burn it."[42]

In 1957, the department asked the city council for an amendment to the ordinance to remove trees on private land and assess the costs against the property in a manner similar to the city weed ordinance. After study, the council deleted the assessment provision and established a special fund of $2,500 to be used so that the removal of any infected trees would not cause a hardship to any property owner.[43]

It was decided that this work on private land should be done by private contractors rather than city crews and the Park Board established a policy and specifications for such removals under the supervision of the City Forester.[44]

Work with private contractors and property owners developed a special set of problems. These problems required constant review by the staff and periodic (usually annual) revision of (1) bidding procedure, (2)

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[42]Report to the Park Board, May 9, 1956.

[43]Haskell, 1960 Report at State Dutch Elm Disease Conference.

[44]Report of the Park Board, July 10, 1957.

specifications, (3) field procedures of inspection and supervision, and (4) office procedures of keeping records of trees and payment for contract work. Awarding contracts to low responsible bidders (city policy) brought many new firms into the picture. Many of the same problems had to be worked out with each new contractor. For example, complaints on damage and cleanup, working on adjacent property without contacting either property owner,[45] laxity in following specifications, poor public relations, damage due to hasty improper techniques of removal, use of poorly trained labor and other problems connected with low bidding by firms inexperienced in large contract operations.[46] Due to various pressures, three contract firms were forced to drop their contracts and the department had to reassign the balance to another bidder.[47]

In the 1960 report Haskell summed up the evaluation of the original program. In addition to the rising cost, the disadvantages were: (1) time required to administrate, and (2) that few owners spray. Advantages included: (1) quicker sanitation under city contract,[48] and (2) better records on the infected trees because the owners will call in to get the condemnation made.[49,50]

In 1960, the survey crew found beetle breeding wood in 68 locations during the spring survey.[51] The 1961 survey found 167 locations, 75 percent of them in the newly annexed areas including the North School district. This was featured in a news article with the message, "City will burn it if you get it to the dump."[52]

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[45]Letter from Theodore Haskell to T&T Tree Experts, September 6, 1960.

[46]Annual Report, 1963. [47]Council Proceedings, 1964, p. 182.

[48]This changed as the numbers of trees increased through the early 1960's.

[49]The city policy of paying the full cost applied only to diseased trees. If the tree were dead from unknown causes, the owner had to pay the full cost himself.

[50]Haskell, 1960 report. [51]Report to Park Board, May 11, 1960.

[52]State Journal (Lansing), May 5, 1961.

In 1961, 517 trees were removed by contractors at an average cost of $30.79 per tree. The department was forced to ask the Council for additional funds (see Table 2, page 48).[53]

With the increase in contract work, other methods of contracting were reviewed. One method involved taking bids for an entire season on a size class basis. This is a system used by some county road commissions. However, the problems, inherent in the removal of large trees in the city, favored such a plan only for the small size trees up to six or eight inches in diameter. There should be special provisions for large trees or difficult areas (wire, buildings, fences, "carry-out" jobs) so that the contractor and the forester could negotiate price.[54] Both Smith Tree Service and Ingham County Road Commission favored bidding by large lots rather than a yearly contract.[55]

By 1963, the rising costs of the city sanitation program on private land forced a reappraisal by the department staff and in June they reported to the Park Board.

> For the past six years the Council has appropriated funds to be used for contract removal of diseased trees on private land. These costs climbed from $158 to nearly $27,000 in 1962. Only $15,000 has been budgeted for the 1963 season and it is the feeling of council that the policy should be changed to spread a portion of the cost back to the owners of the trees.[56]

During the budget hearings the staff had prepared materials reviewing the removal policies of other cities regarding private trees and outlined three alternative methods with estimated costs, advantages and disadvantages of each. Examples were given using hypothetical cases to show how the costs would affect the city and individual property owners.[57]

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[53] Departmental report, 1961.

[54] Letter from Paul Tilford, National Arborist Association, to Theodore Haskell, January 16, 1962.

[55] Conversation by David Phillips with Edward Smith and Frank K. Evans, July 1964.

[56] Report to the Board, June 12, 1963. [57] Departmental files, 1963.

After consideration, the Park Board recommended a change in policy to the "$30 Deductible Policy." This policy required that the property owner pay the first $30 of the removal cost of any tree removed by the city contractor and the city would pay the balance. This allowed the property owners to bear a share of the cost, while protecting them from the high costs involved with a big tree. The Board also recommended amendment of the ordinance to allow assessment of all or a portion of the cost of removal against the property.[58]

The change in policy was approved by the council, and the ordinance was amended, and the policy went into effect for the 1963 season.[59] About 32 percent of the infected trees were removed by the owner. These were usually the smaller trees in which the owner would bear the full cost anyway. During 1963 the costs for trees removed by city contractors, split about 40 percent city share, 60 percent property owner. In this respect the change in policy was successful, but there were some other problems. Most owners removing their own trees did not spray or clean up the jobs as promptly. Extra inspections were needed at increased cost to the city. Jerome Allen, Assistant Forester, noted "We must use education and continue inspections to show the departmental interest in this phase of the control program."[60] He also noted that the cost of the total program had been reduced through the use of a hydraulic crane and aerial tower truck for city removal operations on public land.[61]

The $30 Deductible Policy was continued in 1964 with 27 percent of the condemned trees being removed by the owners. The elm removal lots were increased to approximately 400 trees to reduce the number of complaints

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[58] Letter, Hayden to City Council re: Board action, June 12, 1963.

[59] Council action, July 8, 1963. Proceedings of City Council 1963, pp. 620-21.

[60] Departmental Report, 1963.

[61] Ibid.

and the amount of removal time caused by a number of small unreliable contractors. The change in bidding procedure worked out well.[62] Need for an additional $56,000 for the city share of removal contracts resulted in a review of policy with the Board and City Council, but it was decided that policy changes were better instituted at the beginning of a fiscal year and applied equally to all property owners within that period.[63]

The numbers of diseased trees continued to rise in 1965. Past records indicated that the early survey work projected losses that could not be handled under existing policy with the budgeted funds. After a series of conferences, the staff prepared a breakdown of costs for five alternative policy changes for sharing the cost of removals. Again, the department used a case study example to illustrate how the cost would be shared between the city and the property owner. The recommendations also considered a number of problems and concerns which had been brought to the attention of the department by the property owners. Advantages and disadvantages of each of the proposed changes were given.[64,65]

The main shifts in policy were:

1. To treat dead elms the same as those condemned through laboratory diagnosis. Shared benefits would apply to both classes of condemnations.
2. The property owner could choose to have the city contractor remove the tree as before, but he would pay the first $50 of the cost plus 50 percent of the balance. The basic cost would change from a per tree to a per lot or per parcel (in the case of unplatted land) basis with a limit of $2,000 on the city share.[66,67]

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[62] Departmental Report, 1964.

[63] Communication to Committee of the Whole, October 26, 1964.

[64] Letter to Mayor and City Council from Hayden, July 30, 1965.

[65] Council Action effective August 19, 1965, Proceedings of City Council, pp. 1043-44.

[66] This provided for a number of ownerships of wood lot areas with large numbers of trees. Some of these owners decided it might be more feasible to give the land to the city — as park land — than to pay the high cost of the removals.

[67] Departmental Records and Departmental Report, 1965.

3. In addition to the $50-50 percent removal policy, the department also changed to a new system of contracting. Bids were requested on an hourly rate for crews (including specified men and equipment), rather than on a per tree basis as before. The contract required a minimum of four crews, plus a general superintendent. The city added two "inspectors" to work with these crews and the general superintendent. These inspectors work closely with the contractor to set up work schedules and job estimates.[68] A new multiple-copy work order form was devised with itemized copies of work performed going to the property owner, the city, and the contractor.

The effects of the change from the $30 Deductible Policy to the $50-50 percent policy were as much as anticipated. At the date of the report (January 1966) about 59 percent of the condemned trees had been removed by the owner or his agents. The city contractor had removed approximately 600 trees at an average cost of $113 per tree.[69] Closer inspection of the contractors has added to the administrative costs of the program, but has resulted in better control of the operation, fewer complaints and more cooperation from the property owners and fewer breakdowns in the operation. While there are no advance bids made as before, the staff felt that the contractor's statements reflected a much closer agreement with the actual cost of the job than before. When the sealed bids might have been too low, several inexperienced contractors lost money. In other cases the bids could have been high to provide against unexpected trouble in the case of difficult removals.[70]

Summary

Sanitation was the original method of control. It means the destruction of all breeding sites before the elm bark beetles can emerge in the

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[68] Departmental Report, 1965.

[69] Ibid.

[70] Conversations with David Phillips, May 1966.

spring. A thorough program is costly but the high losses which follow unchecked "population explosion" of bark beetles is worse. One of the major problems of any sanitation deals with the trees on private land. Most of the policy changes in Lansing were concerned with trees in the private sector of the program.

The original private elm policy provided for removal of trees by city contractors at no cost to the property owners. Nor did the original ordinance provide for removal of dead elm materials, but this was amended in 1963 to allow for removal and assessment of costs. By 1963 rising costs forced a change to the $30 Deductible policy. Again, in 1965, the policy was changed to include both diseased trees and elm materials that would breed bark beetles. If these were removed by the city contractor the sharing was on the $50-50 percent basis. The city originally bid the trees on the sanitation contracts individually, then changed to bidding by larger and larger lots (arranged on a geographical basis). Finally in 1965 the city changed to bidding on a crew-hour basis instead of a per tree basis.

The sanitation rationale is summed up in the ten-year report of the Plant Industry Division of Wisconsin. To control the Dutch elm disease by scouting, and removal of diseased trees "when convenient," is not control but wishful thinking. Sanitation must be the basis of any control program. "Not complicated or difficult, it only must be thorough."[71]

Spraying

Spraying did not become a significant part of the control programs for the Dutch elm disease until DDT and mist sprayers were developed after World War II. While the basic rationale for spraying is easily explained, and has a lot of appeal for people who hope for an easy solution to the control problem, it cannot do the job alone.

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[71] Elms Are in the Picture (Wisconsin Department of Agriculture, Plant Industry Division Ten-Year Progress Report, 1965), p. 24.

Spraying Rationale

Since beetles infect elms by feeding on the trees, the purpose of spraying the elm trees is to prevent the beetles from feeding.[72] Joseph Dietrich, pioneer in the use of DDT in Greenwich, explains the reason for spraying in addition to a sanitation program. "Town budgets cannot stand to remove, and trim all the dead wood, so they spray." In support of this, he cites comparative costs of spray program at $2 per tree and sanitation pruning at $8 per tree.[73] Though Greenwich has an enviable record for a control program he considers spraying to be "at best a standby solution. Holding the line until such time as science comes through with a more advanced solution."[74]

Spraying, then, is a special technique to preserve high value elms when it seems difficult or impossible to eliminate or reduce the beetle population through sanitation. In an area with a large number of "wild elms" or considerable exposure to fringe areas where removal of infected trees is not enforced, spraying is cheap annual insurance for a valuable tree. However, spraying is one of the most controversial parts of the recommended control program.

To begin with, even the entomologists did not seem to agree. Sanitation, the first method used, was sound in theory but tended to break down in practice. Yet the State of New York seemed to favor only sanitation. This position was widely quoted during the 1950's. When the anti-spray forces of organic gardeners and bird lovers discovered a spokesman in Rachel Carson,[75] many spray programs were challenged and abandoned.

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[72]Russell Whitten, Essentials of Dutch Elm Disease, Proceedings of Second Statewide Conference on Dutch Elm Disease (Chicago: Illinois State Chamber of Commerce, November 1956), p. 68.

[73]Joseph Dietrich, comment in discussion on spraying, Proceedings, National Shade Tree Conference, 1956, p. 166.

[74]Dietrich, Seventeen Years . . . .

[75]Rachel Carson, Silent Spring (Greenwich, Connecticut: Crest Reprint, Fawcett Publications, 1962), pp. 97-120.

The challenge took two forms: (1) the elms were not worth protecting compared to the dangers to wild life, and (2) the spray did not protect the elms anyway.

The first challenge has not been resolved and may never be. It deals with two separate value systems and emotional partisans can be found on the extreme ends of either position. In the long run the issues involved seem to require far more knowledge of ecological relationships, particularly urban-ecological relationships than the best informed men possess at this time.

George Parmalee feels that the effects from spraying represent only a small portion of man's effect on his environment.

> The harm man has done to wild life by felling forests, tilling fields, and draining wet places, polluting waters and through growing urbanization is of much greater consequence than the relatively small and temporary losses that have occurred from pesticides.[76]

George Parmalee, curator of the Department of Physical Plant, Michigan State University, also made the point that 96 percent of Michigan is not subject to spray of any sort and concluded "there would thus seem to be room in our future for both song birds and American elms."[77]

The observations in the Lansing area indicate that due to the dispersal of elms over the city, and the fact that city spraying for elms was confined to scattered street locations and selected areas of the parks, complete eradication of the robin population has not occurred.

Fred B. Knight, Associate Professor, School of Natural Resources, University of Michigan, supports Dr. Parmalee's position as to effect of relatively small-scale applications on the overall ecology of larger areas.[78]

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[76]George Parmalee, "The Dying American Elm: Why It Must Be Saved," Michigan State News (East Lansing), January 8, 1963, January 9, 1963.

[77]Ibid.

[78]Fred B. Knight, "Factors Which Affect the Control of Dutch Elm Disease," Michigan Municipal Review, March 1963.

When the midwesterners began to check the claims of the "anti-spray sanitarians" back to the sources, they found a slightly different, but significant position held by the authorities in New York. They did not "reject spraying" as many people feel that Rachel Carson implied, but ranked sanitation ahead of spraying in comparing the two control techniques.[79]

Mr. Henry Page, Director of Division of Plant Industry for the State of New York, wrote, "We feel that the sanitation part of the program is the one that would bear the greatest fruit for a given number of dollars."[80]

Speaking at the Dutch Elm Disease Conference in Chicago in 1955, Dr. Donald S. Welch of Cornell emphasized that, "If there is any apparent disagreement, it is the matter of emphasis rather than of basic principles." He felt that both should be used wherever possible in control. "It is just a question of which should come first."[81] The records of many cities provide specific answers as to the effectiveness of a spray program in protecting high-value elm trees.

Lyle O. Sayler, Landscape Supervisor, Illinois State Department of Mental Health, compared losses in the same town. Manteno Hospital had sustained a spray and sanitation program for ten years, and still had 75 percent of their elms. In the city cemetery and adjoining state hospital cemetery, less than a mile from the hospital, only 12 elms remained of 184. Approximately 6 percent survival where sanitation alone was practiced.[82]

Rockford, Illinois sprayed only one year (1956 to 1957). In 1961 they were forced to remove 12,320 dying trees and have removed a total of 19,029 since the disease struck in 1954.[83]

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[79] Dietrich, ISTC, 1963, p. 138.

[80] Henry Page as quoted by Toledo Municipal League, "Dutch Elm Disease Control — A Survey of Municipal Practices," Research Report No. 110, November 5, 1962, p. 9. (Mimeographed.)

[81] Welch, p. 25.

[82] Chicago Daily News, June 1964.

[83] Toledo Municipal League Report 110, p. 4.

Rachel Carson quoted Joseph Sweeney, then superintendent of Forestry in Toledo, as one who had stopped spraying. After spraying from 1953 to 1959 he investigated and was "shocked by his findings," where they had depended on spraying alone the disease was out of control.[84] The only areas where control existed were where they had practiced sanitation. Toledo abandoned spraying in 1959.[85]

In 1963, Robert Metz, Commissioner of Forestry in Toledo, gave the rest of the story. Toledo had an estimated 50,000 elms on the streets and lost about half of them to Dutch elm disease in ten years. The spray program was stopped in 1961 (this differs from Carson's date of 1959). At that time the Toledo program was only removing trees, 1,700 by the summer of 1963. They estimated another 2,500 more dead or dying elms standing.[86]

It seems extremely unlikely that any of the three communities cited practiced sanitation in the refined sense described by Dr. Welch or Dr. Miller. It is more likely that when spraying was dropped, all measures but the urgent removal of hazardous trees were dropped at the same time, community interest dwindled and the beetles multiplied unchecked.

Many of these communities did have established park and forestry departments. What sort of pressures did they face? Fred See of Grand Rapids gave six major reasons why their department discontinued their overall program in 1960. They did continue sanitation removals of public trees and continued to spray selected park trees.

1. Drift problems with spray operations.
2. Car washing problems from spray materials.
3. Audubon society pressures regarding loss of robins.
4. Hard to remove infected trees on private property because of high costs on individual property owners.

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[84] Spraying alone has never been recommended in Michigan.

[85] Carson, p. 108.

[86] Statement by Robert Metz (International Shade Tree Conference, 1963), p. 158.

5. Costs were prohibitive especially on private land.
6. They did not feel that they were getting results because of constant reinfection.[87]

These are the same reasons why other cities dropped spraying and often the rest of the program a year or so later as "sanitation," usually limited to removals, was unable to protect a significant number of elms. Lack of understanding of the purpose and method was a large part of the problem.

To begin with, spraying can only prevent inoculation by "killing the beetles before they can chew holes in the trees."[88] Thus spraying cannot protect a tree from infection through root grafts. Misunderstanding of root graft infection has given spraying an undeserved black eye.[89]

Second, many communities incurred high costs before it was necessary. J. C. Carter advised that during the "invasion phase,"

> Communities with limited funds may wish to spray only near infected trees. Spraying all elms within 1,000 feet of a diseased elm tree should give worthwhile protection since most of the beetles do not fly more than 800 feet from the tree from which they emerge.[90]

The technical operation of spraying for Dutch elm disease was different from much of the spraying that people were used to. Janes lists three problems:

1. The plant is tall and wind makes coverage difficult.
2. The machine must be adjusted for the job at hand.
3. Concentrations of spray are high which increased the cost per tree.[91]

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[87]Frederick C. See, "Grand Rapids Experience with Dutch Elm Disease Control," Proceedings Dutch Elm Disease Control Conference, December 11, 1961, East Lansing, Michigan, p. 8. (Mimeographed.)

[88]Whitten, p. 68.

[89]Dale Norris, University of Wisconsin Entomologist, quoted in the Chicago Daily News, June 1964.

[90]Carter, Illinois Trees. . . ., p. 66.

[91]Ray Janes, from Haskell notes on Dutch Elm Disease Conference, 1956.

While a hydraulic sprayer could be used for applying the spray, mist sprayers were recommended.[92] Mist spraying reduced the danger to wild life from runoff, excessive drift and puddling; the concentrate spray meant a substantial labor saving on refill time,[93] and the mist gave better coverage in the larger trees. Hydraulic sprayers were used only in limited access areas where the truck-mounted or tractor-drawn mist sprayers could not get close enough to the trees.

Foliar applications were recommended in addition to dormant applications in the early stages of control work, but to reduce the injury to bird life and sensitive plants, and to reduce costs of the programs, foliar spraying was gradually dropped in favor of a fall or spring dormant application.[94] Bio-assay research, with sprayed twigs and captive beetles, indicated that annual spray of 12-1/2 percent DDT would give good protection; if the operators did not spray in wind or rain or at temperatures below 40° so that the spray will dry before it freezes.[95]

Proper spraying costs money, but anything less than enough of the proper material, applied by a conscientious operator, will not protect the trees and the entire cost of labor, equipment and material will be wasted.[96] Proper training of an operator requires practice, and an observer to watch coverage. Lansing used to practice without spray material in park areas to train spray operators.

From time to time airplane application is suggested for Dutch elm disease control. While converted bombers and other aircraft have been used successfully to fight Gypsy moth, Japanese beetle, and Cereal leaf

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[92] Janes, Folder F-195, p. 10.

[93] Hydraulic for canker worms @ $.30 per tree with mist, @ $.58 per tree with hydraulic; letter to George L. Bean from Theodore Haskell, July 18, 1955.

[94] Janes, Folder F-195, p. 11.

[95] Whitten, p. 22.

[96] Ibid., p. 23.

beetle in Michigan, such aerial application of a chemical to control Dutch elm disease is not suggested for use in Michigan.[97] Ray Hutson, Department of Entomology, Michigan State University, commented that Marshall, Michigan felt that the conventional spray bid of $1.85 per tree was too high; so they tried an aerial spray but lost an unreasonably high number (107) of private elms.[98]

There has been some recent research on helicopter spraying in recent years. The Wisconsin Department of Agriculture has done bio-assay work on helicopter-sprayed trees for the past two years. In all cases so far there has been a decrease in the number of feeding wounds and an increase in beetle mortality, compared with results using unsprayed check twigs. The main advantages are the same ones that the mist sprayer obtained over the old hydraulic; a larger number of trees can be sprayed in a shorter time with less insecticide. One community reported 10,000 elms sprayed in seven hours at a cost of $.44 per tree.[99]

Spraying Procedure

Lansing had a mist blower and veteran operators when the first trees were condemned in 1956. The operators had considerable experience in the ground phase of the gypsy moth campaign of 1954 and mosquito control spraying in 1954 and 1955.

Whitten had indicated that good technique was necessary. He had recommended two to three gallons for an "average fifty-foot elm." In an attempt to convert this guide into a usable procedure, the department set up a study.

Data was obtained from 150 elms including height, D.B.H. and crown volume. After graphs were made from the data and the plotted curves were balanced, the average 50-foot elm was found to have a diameter of 18 inches.

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[97] Janes, Folder F-195, p. 8.

[98] Ray Hutson, Dutch Elm Conference, Haskell notes, 1960.

[99] Elms Are in the Picture, pp. 22-24.

D.B.H. and crown volumes were also graphed in relation to diameter and the average 50-foot elm was found to have a crown volume of approximately 20,000 cubic feet. (See Appendix D.) If this represented 2.5 gallons of spray, then approximately one gallon should be used for each 8,000 cubic feet. This was marked on the graph for easy reference and a time table constructed to correlate with the D.B.H. (Diameter Breast High approximately 4'6".)

> In practice we used a three-man crew, with one man on foot to measure the trees and signal how many minutes to spray each tree. After an initial training period the men became quite skillful, though we still use a stop watch to impress them with the need for timing.[100]

In this way, the department obtained good initial data for planning and brought the operators through the change-over to the more intensive spraying technique needed.[101]

When the first trees were condemned, all city elms within two blocks of the infected were sprayed with DDT. This amounted to 600 trees.[102] A dormant spray was then scheduled for the same areas in 1957.

Plans for 1958 included a new mist sprayer, early morning spraying to take advantage of the quiet air, and a training program to develop new sprayer operators by switching one man at a time onto the crew.

Warren, of Brookline, gave some valuable advice on night spraying:

> You will receive complaints from the residents, therefore I suggest you give it widespread publicity and also notify your police and fire department so that when they receive calls about noise and smell of oil they will be able to answer questions without investigating or sending a fire truck into the area.[103]

This advice was carefully followed in the Lansing operations and is credited with much of the success of the night spray operations.

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[100] Letter from Theodore Haskell to Russell Whitten, November 5, 1959.

[101] Department Records, 1958.

[102] Report to the Park Board, October 10, 1956.

[103] Warren, p. 43.

The addition of the 300-gallon tank mist sprayers made a better operation possible. Costs were reduced from $1.26 per tree to $.99 per tree, since material costs were much the same, the greater volume output and tank capacity were credited with the saving. The 300-gallon sprayers were used almost entirely on the streets since they are much less maneuverable than the 100-gallon machines.[104]

Foliar spraying was used around infected trees until 1958. By that time the disease was established in the countryside and all emphasis was placed on dormant sprays.[105]

This first fast action, combining of foliar and dormant spray, was apparently successful in retarding the secondary spread of the disease within the city until it had become generally established in the area.

By 1960, night spraying from 10 p.m. to 7 a.m. was in general use to take advantage of the calm night air and absence of traffic and parked cars on the streets. Park and cemetery trees were scheduled for fall dormant spray when the ground was firm. The balance of the street spraying was scheduled for the spring. The same geographical procedure was followed each year, so that residents were able to plan their window washing and yard work to avoid conflict with the spraying.[106]

Over the years there have been claims for damage to automobiles by the spray. Departmental position has been that city cars and equipment have not suffered permanent damage despite repeated exposure, and further, that all claims must be submitted directly to city council. The council has concurred with the departmental view that this is a government service similar to salting the streets and as such no settlement has been made for claims of damage of such a temporary nature.[107]

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[104] Letter to G. W. Goodall from Theodore Haskell, March 13, 1961.

[105] Letter from Theodore Haskell to Bruce Brockway, Toledo, May 15, 1959.

[106] Report to Park Board, April 30, 1960.

[107] Letter from Theodore Haskell to State Farm Mutual Insurance, May 9, 1961; also Departmental Records.

While great efforts were made in the late 1950's to spray on every possible occasion during the dormant season, this was often wasteful of manhours and equipment time.[108] The spray operations were redesigned to produce a maximum effort during the short periods when the weather was favorable. A number of various expedients were developed during this period: chain fall and front-end loaders to handle barrels, use of hydraulic sprayers to carry pre-mixed spray material to the 100-gallon sprayers in the field, and two-inch hose to fill spray tanks in the garage. Each device was tested and used until the advantage was surpassed by new developments. By 1965 the use of two 300-gallon mist sprayers and one 100-gallon sprayer increased total output to more than 600 trees in a single night. The entire 1965 season included 12,822 trees; these were sprayed in 24 days of operation (or nights) for an average operation output of over 500 trees per day. The big sprayers and special refill pumps made this "high intensity" approach possible. With a "season" of only two weeks in the spring and again in the fall, public relations have been much better. Morale of the spray crews is also improved in comparison with the years when the spraying seemed to go on almost forever with constant starting up and frustrating "freeze-outs" and "blow-offs."

The pattern used to schedule the various areas has been established from past records and daily progress is charted against the records of previous years. This provides excellent feed-back and makes overtime decisions and other critical scheduling much easier.[109]

Research

Some experimental spraying has been done with methoxychlor. This material is more expensive than DDT, but it has been widely recommended as a substitute for DDT that would be less harmful to wild life. In 1964, 9 percent of the trees were sprayed with methoxychlor. As a guide to

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[108] Conference with Carl Fenner, December 4, 1959.

[109] Departmental observations, 1965.

spray operations, Whitten said that a spray program might be considered successful if it reduced losses by 90 percent.[110] Using Michigan State figures of 30 percent losses in uncontrolled areas, this gives a 3 percent loss (30 percent reduced by 90 percent) as within the standard. Losses in the two areas were 8 percent compared with a city-wide loss of 2.5 percent where DDT was used. This differential pattern may reflect the more limited residual of methoxychlor.[111] The Lansing experience was confirmed with results in Milwaukee. Comment of one forester was that "the car damage problem remained the same and the control was not as good."[112]

On the other hand, Dr. James Butcher of Michigan State University's Department of Entomology, reported in a two-year study that losses in a methoxychlor area ran about 1 percent compared with losses of 3 percent and 3.5 percent for DDT and 66 percent and 50 percent in unsprayed check woodlands near the campus.[113]

Edgar Rex, New Jersey, said that:

> We need a therapeutic chemical that could be applied to a recently flagging tree, and would arrest the progress of the disease. Instead of spraying 100 percent of the elm population, we could work with only the victims — scouting would have to be good, but many problems would be solved.[114]

Experimental work by departmental staff with members of Michigan State University staff has used a number of new sprays and systemics. These have been tested outside the Lansing control zone on previously

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[110] Whitten, p. 25.

[111] Dutch Elm Disease Report, 1964, Lansing.

[112] Conversation with Stoeckman, Bureau of Forestry, February 5, 1964.

[113] The State Journal (Lansing), April 24, 1966.

[114] Edgar Rex remarks, International Shade Tree Conference, 1963, p. 154.

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[108] Conference with Carl Fenner, December 4, 1959.

[109] Departmental observations, 1965.

unsprayed park property. DDT remains the only proven insecticide to give the necessary residual effect.[115]

In the planning stages is a special spray program to prevent beetles breeding in the trunks of recently trimmed elms.[116] This experiment follows the work done in Detroit in 1965.[117]

The spraying discussed has been restricted to departmental spraying on public trees. Private spraying never developed to a significant extent.

Part of the problem was the limiting factor imposed by the weather. Wind, rain, and cold become more critical when private trees must be scheduled for spraying. Soft yards, spray drift and other problems are more involved with individual contracting methods. Only one local tree company was really equipped to handle large quantities of trees and many people felt that his costs were high. In a few parts of the city where interest in the program was higher and some meetings were held on the problem, spraying was scheduled on a group basis.[118]

Summary of Spraying

The purpose of spraying is not to kill beetles, but to protect specific trees by preventing the beetles from feeding on them. Spraying with DDT will do this, but there has been opposition and apathy and many programs were suppressed by opposition or withered from lack of support. In many of these communities, the losses of elm trees have been much higher than communities that used spraying in addition to a sanitation program. Part of the problems resulted from ignorance of the proper methods and lack of trained men and equipment. The Lansing program started with limited objectives and gradually expanded the force of crews and equipment to meet the increase of the disease in an effective manner. While research is

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[115] Departmental Dutch Elm Disease Reports, 1964, 1965.

[116] Departmental Dutch Elm Disease Report, 1965.

[117] Michigan Forestry and Park Association Meeting, February 18, 1966.

[118] Conversations with Edward Smith and David Phillips, 1959 to 1966.

going on in improved chemicals, both sprays and systemics, and although new techniques are being tested each year, the spray program will be retained in Lansing until better methods are confirmed and recommended by the State Department of Agriculture and Michigan State University.

Public Relations

> Perhaps the most pressing demand on the park administrator is to continually search for effective means of presenting park values to councilmen, boards, the general public, so that development may be continued in competition with other governmental functions.[119]

It is not enough that the city have a desire to do something about the Dutch elm disease. The authority to act must be placed in the hands of someone who knows what to do, or who has the ability to find out. Nor is it enough to secure an able technician to set up a program, the people — "councilmen, boards, the general public" — must be kept informed so that the program may be sustained long enough to be effective in meeting the needs of the community. This requires not only a skilled specialist in the technical aspects of control programs, but someone with skill in the art of communications.

In the field of public relations the administrator must deal in words, but he must also be aware of differences in meanings. Samuel Hayakawa put it this way: "To a mouse cheese is cheese, that's why mousetraps work."[120] Unless planners, and park men and city administrators remember that tree^{a} is not identical with tree^{b}, and that community^{a} is not community^{b}, confusion will accumulate and conferences, planning sessions and decision making will begin to slow down.

Concepts and terms must have a common meaning to both the administrator and his community if he is to understand the attitudes and needs

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[119] Charles E. Doell from notes of Theodore Haskell, March 13, 1961.

[120] Samuel I. Hayakawa, "How Words Change Our Lives," Adventures of the Mind (New York: Alfred A. Knopf, 1961), p. 250, quoting Wendell Johnson.

of the community in the planning of a control program, and if they are to understand him during the implementation and operation of the various technical procedures. The administrator must be sensitive not only to the words used by the people, but to their actions. "The meaning of a term," says Hayakawa, "is to be found by what a man does with it, not by what he says about it." We understand a dollar bill not by looking at it, but by observing what a man does when we give him one.[121]

Bancroft was well aware of the importance of close mutual communication between the professional administrator in charge of the programs and the individual property owners of the community.

> We appreciated the fact that in the great majority of cases, the owner had every right to know what we were trying to do, and that he was prompted by the same interest that we had in improving and preserving his trees. If we were both sincere we could get along — and we have.[122]

In most situations requiring control programs, the difficulty is to start in time. Charles Adrian warns "Americans spend their civic lives in putting out fires rather than in fire prevention activities."[123] Problems and community issues reach the attention of the average man only when he can be convinced that a genuine crisis exists . . . when a crisis can be described in terms of human interest and personal involvement. Again, the need for communicating in understandable terms. The specialist must be able to analyze the situations and pass the information to the public in a manner that they can accept. This acceptance implies understanding of the problem or faith in the specialist on the part of the public.

Such a successful relationship is not automatic. Adrian comments:

> In a democracy it is the popular and not the informed concept that prevails much of the time . . . the purpose of democracy is to permit a maximum of individual choice

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[121] Ibid., p. 239.

[122] Bancroft article, August 1941.

[123] Adrian, p. 5.

> or freedom, no matter how uninformed . . . the planner will usually have to settle for leadership by the slow education of those who will listen.[124]

Public relations, then, must be a continuing process, based on concepts and terms accepted in common and conducted over a long period of time. Often the confidence of the people like the organization itself must be built in anticipation of a critical situation. The professional administrator must follow a system of long-term building of public confidence rather than a frenzied drum-beating in time of crisis.[125]

Public Relations Procedure

Public relations in the department followed the guidelines laid down by Bancroft and Fenner. Mutual understanding and quality workmanship were applied to program after program. Contacts were maintained on three major levels: Mayor and City Council; other agencies and other professionals; the general public through news media, television specials, talks to groups and individual contacts.

In 1956 a file of information was started on the Dutch elm disease. This file included information on the following topics and formed the basis for work on all three levels:

1. Control programs in other cities.
2. Legal information.
3. Spraying: schedules, materials, costs.
4. Current material on the status of Lansing program.
5. Educational material to implement the educational program.[126]

Mayor and Council Level

> Much is said of the quiet power of the decision-makers in each community, but "decision-makers" depend on

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[124]Charles Adrian, "Metropology and the Planner," Talk prepared for presentation before the National Planning Conference, American Society of Planning Officials, Atlantic City, May 2, 1962, p. 7.

[125]Opinion expressed by Louis F. Twardzik in conversation, May 15, 1961.

[126]Dutch Elm Disease, departmental report, March 21, 1956.

votes and/or the good will of the people. The way to influence them is not to lecture them but to show them. . . .[127]

The basic departmental policy for formal communications to Mayor and City Council is based on city charter requirements:

1. All official communications must be on the agenda by 5 p.m. Thursday preceeding Monday meeting.
2. Original goes to clerk.
3. Copies to parks committee (3), sometimes to entire council.
4. Decisions must be made as to how much detail to include in latter. If material exceeds one or two pages, back up mimeographed materials are often used.
5. Director and staff members often appear before the Committee of the Whole to explain recommendations and answer questions when an issue is complex.

Councilmen frequently receive calls regarding the Dutch elm disease as to the status of a certain tree, condemnation, removal procedure or removal cost. The department procedure is to investigate promptly, often records show current status, report to councilman by phone, often confirm in writing. These informal communications provide both councilman and department with a record.

For example, in 1963 the department prepared a "time-cycle" for processing Dutch elm disease cases under current policies. This table showed the elapsed and cumulative time required from the taking of the first sample from a wilting tree to final cleanup of the removal. At that time it was running between three and four months.[128]

Preparation by members of staff and especially administrators was stressed by one veteran councilman as having top importance to members of council:

1. Be prepared, in all contacts with Council, budget meetings, committee meetings, etc.
2. Check the agenda each Thursday or Friday, then check with the Clerk on any matters that might pertain to the department.

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[127]Editorial, AIA Journal, November 1964, p. 6.

[128]Letter to Malcolm Milks, September 3, 1963.

3. Keep the chairman of the Parks Committee informed as to significant facts. With this "ammunition" he can pick up more council support.[129]

Other Agencies and Other Professionals

Professionals in other agencies and in other cities are kept informed of departmental activities through membership in the state and national organizations. Members of the forestry staff have been active for years in these groups. One of the most valuable groups has been the Forrest Strong Chapter of the Michigan Forestry and Park Association. Meeting about ten times a year, the city foresters from Lansing, Jackson, Kalamazoo, Grand Rapids, Kent County, Ann Arbor, Flint, Battle Creek, Coldwater, Midland, and Pontiac have shared programs of education and discussion of their mutually shared problems. In most cases the city forester is the only local professional. Except for these meetings he has no chance to offer his ideas for constructive comment by men qualified to judge the technical problems of his work.

Copies of the departmental annual report are currently mailed to a list of approximately 60 other forestry departments, educators, and interested people. The annual report on Dutch elm disease has been distributed to staff; Park Board; The State Journal; Plant Industry Division of Michigan Department of Agriculture; Michigan State University faculty in Forestry, Plant Pathology, Entomology; and city foresters from other Michigan cities.[130]

Such interlocking communication channels allow for feedback on technique and helpful comments. By knowing these other professionals as "people" instead of anonymous "positions," the departmental staff was able to assemble the best possible information on Dutch elm disease or other problems in a short time. Moreover, the information has usually

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[129]Opinion expressed by Lucille Belen in conversation with Theodore Haskell, July 25, 1963.

[130]Department files.

been tested under field conditions and is available in far more specific detail than is usually possible when printed sources are used alone.

The newspaper has been one of the best means of getting the Dutch elm disease story to the general public. In July 1956, the first headline read, "D.E.D. Spells Dead." This story followed confirmation of the first case. In substance the people were told — "It has reached Lansing. There is no need to panic; the situation in Lansing is under control and is being watched." The obvious questions were answered: What does it look like? What is being done? Pictures showed beetle, life cycle, and burning at the dump.[131]

Through the past ten years the news stories continued, reporting changes in policy, additional evaluation, addition of new equipment, current losses; and most important, information on spraying schedules.

In 1957 the department prepared a brochure, What Does the Dutch Elm Disease Mean to You? The brochure was based on specific questions asked by the public during the years 1955, 1956, and 1957, and included a picture of an elm leaf and life-size drawing of a bark beetle. These brochures were given out by the scouts, inspectors, and spray crews; they were distributed from city hall, at home shows, garden clubs, and at special Dutch elm disease programs. Small cartoons were used. Each answer was "boiled down"; the language was brief and to the point. The current Michigan State Dutch Elm Disease folder was used where the people wanted more detailed information.

Television has played a smaller part, but members of the staff have appeared on two shows regarding aspects of the Dutch elm disease program.[132]

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[131] The State Journal (Lansing), July 22, 1956.

[132] The Many Worlds of Len Stuttman, regarding the use of pesticides and the city's position in conducting a control program, December 2, 1963; The Beetles Are Coming, a community service program with members of the Michigan State Entomology and Plant Pathology faculty, Plant Industry Division of the Michigan Department of Agriculture, and Superintendent of Parks of East Lansing, October 1965.

Forestry programs must have the confidence and support of the people of the city. Visual Education programs are an important part of the departmental public relations program designed to develop this public support. Among the most rewarding have been the Arbor Day programs. Between 1954 and 1961 the department planted 26 trees at ten schools and has contacted over 6,415 children.[133]

During the ten years before the program started, departmental staff members talked to 9,424 people. Between 1956 and 1965, talks were given to 13,950 people. Most of these talks were given to small groups allowing face-to-face personal contact and questioning as to their specific problems. It is hard to appraise the cumulative effect of such talks to public groups, but often actions shout when words are silent. "Our librarian reports interest in tree books went up 100 percent the past week — thanks to you."[134] Often the feedback may be delayed for years, but timely calls for tree diagnosis often originate with an awareness created by such a talk.

Though the work of the forestry division is not as spectacular as other city departments, many people receive direct personal service in the course of a year. A conservative estimate based on 1963 recores amounted to 43,500 personal service contacts with the people.[135]

Each inspection call is recorded and filed. The files go back to 1915.[136] These form the basis for further favorable contact with the property owner who calls for information on his tree problems.

The average citizen judges the city service in Dutch elm disease, or any other program, by how it affects him. He judges this on the basis of

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[133]Report to the Park Board, May 10, 1961.

[134]Letter from Ella Hasse, Principal, Maplewood School, April 30, 1959.

[135]Departmental Annual Report, 1963.

[136]Carl Fenner and Theodore Haskell, "Municipal Arboriculture Problems Old and New," Presented at the National Shade Tree Conference, 1954.

his individual contacts with city personnel. Their training and supervision is of utmost importance in satisfying the public and maintaining their confidence in the programs.

Charles Adrian says, "There is the belief that efficiency and economy are the highest political values held by the American homeowner." He feels, however, that the homeowner may well value some other things higher — in particular, access to decision-making centers and representativeness of local government.[137] Thus, the citizen may derive considerable satisfaction from knowledge that access to service is available to him if and when he needs it. Even if he calls only once in five years, if the department can satisfy him, his long-term image of the department remains good. If he does not feel satisfied, the image remains poor. For example, in many cases the early removal work with contract crews resulted in a poor image from poor work by the contractors. Property owners called "the city" to complain, not the contractor. The new "hour-rate" contracting started in 1965 with city inspectors working with the contract crews provided better contacts with the property owners at the beginning of the job, more cooperation and elimination of complaints at the time of billing.

Summary

A city must not only have the desire to do something about the Dutch elm disease, but the specialist in charge of the program must be able to keep the people informed so that they will continue to support the program. He must be aware of the importance of concepts and terms in communications and use them in analyzing the situations for the use of the public, particularly the decision-makers of the community.

The public relations program in Lansing followed the guidelines established

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[137] Charles R. Adrian, "Metropology: Folklore and Research," Public Administration Review, Vol. XXI (Summer 1961).

[138] Annual Report, 1963.

by Bancroft and Fenner. Long-term confidence in the department was built up through work with the Mayor and Council, other agency groups and professionals in the field, and the general public. The all-important confidence of the community as a whole was developed through news releases, brochures, talks before groups and personal contact. Personal contact is essential because the average citizen judges a program by how it affects him.

Evaluation of Program

Systematic evaluation must be an integral part of the control process. The administrator must make provision for regular evaluations of the control program on which to base his estimates and forecasts.

Evaluation Rationale

Evaluation of a control program implies a determination of value. A measuring of desirable results for the investment of time and money. Judgments as to future action can then be based on this determination. Such judgments include decisions on budget requests, allocation of men and equipment, purchase of materials. Since these judgments will have to be explained and justified to non-professional policy makers, it is often desirable to deal in specifics and convert data into dollars whenever possible. Basic facts like tree inventory and unit cost figures are best used for the specific parts of the program.

Money spent on the program is often best compared with other years on a cost-per-tree basis. These may be simple comparisons or, if trained accountants are available, more sophisticated cost analyses.

Other more intangible factors are difficult to evaluate in concrete terms. These problem areas may include location of a given area, effects of the weather on the beetle population or on spray operations; and future problems that may arise from an annexation, a cut in budget funds, changes in city or departmental policy. These estimates and forecasts can best be inferred on the basis of carefully recorded observations and experience.

An important consideration is the distinction sometimes made that "price" can be determined in a single decision, but "value" must be determined by the benefits returned over the long run. Often a control program must operate for many years before the real value to the community can be noted. A better standard for judging a long-run program might be the relationship of the situation at a given time to the predetermined goals upon which the community made the decision to conduct the program.

While partial evaluations are made of specific parts of the program during the active season, a complete evaluation must be made at least once a year. The best time for evaluation of a Dutch elm disease control program is during the winter months between the fall and spring spray programs.

Whenever a given program is judged, a standard must be selected for comparison. The literature of control programs gives a number of percentage figures that supposedly indicate a degree of success or failure of spraying, or sanitation programs to control the disease. Carter cites an annual loss not exceeding 2 percent of the basic elm population is considered effective control.[139] Dietrich comments, "We have had losses increase from a desirable less than 1 percent to over 2-1/2 percent, these are still good results, but also discouraging."[140] Knight states that sanitation plus careful spraying will reduce losses to less than 1 percent per year.[141] Whitten states that if losses are reduced by 90 percent through a spray program, it is a good job.[142]

Evaluation Procedure

The 1960 evaluation of the Lansing program lists three main points:

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[139] Carter, "Basic Approach . . . ," p. 24.

[140] Dietrich, ISTC, 1963, p. 133.

[141] Knight, p. 56.

[142] Whitten, "Essentials . . .," p. 25.

1. The program is expensive but worth continuing. Cost of removals would be high if the disease became epidemic and the landscape values would be lost.
2. New sprayers will enable the department to cover a maximum number of trees during the optimum weather. This should reduce labor costs.
3. The private property section may have to be abandoned. Hope of containing the disease is slimmer, and costs will rise since no spray program operates here.[143]

In 1963 Haskell wrote,

> As to the success of our program, I feel that it has been reasonably successful considering our circumstances. We are surrounded by uncontrolled areas, and have had additional feed-in with three major annexations. Loss of public trees is slightly over 2 percent.[144]

In the early years of the program, evaluation was a direct appraisal of diseased trees. (See Table 1.) To compare with other cities these figures were converted to percentages of the base population. (See Table 3.) In 1962, it became evident that both spray and sanitation control measures were feasible only in the cases of the street trees and high value park trees. For this reason Program A and Program B-I and B-II were established. In this way the losses in the unsprayed areas would not have an undue weight in evaluation of the spray program.

The 1964 estimate of the situation listed three problem areas for the future:

1. Losses on private property and in the newly annexed areas.
2. Exposure along the fringe areas.
3. Keeping records up to date so the losses could be evaluated in terms of the base population.[145]

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[143]Haskell, 1960 paper presented to State Dutch Elm Disease Meeting.

[144]Letter from Haskell to W. L. Rieger, Director Public Works, Albion, Michigan, January 25, 1963.

[145]Departmental Report, 1964.

Table 3. Comparison of Losses of Elm Trees as Percentages of Base Population

	City			Private			Total		
Year	Population	Loss	%	Population	Loss	%	Population	Loss	%
1956	7,632	5	.07	-	2		-	7	
1957	7,535	2	.03	-	5		-	8	
1958	7,398	23	.3	-	43		-	66	
1959	8,420[a]	41	.5	-	177		-	218	
1960	25,612[b]	177	.7	44,815[c]	325	.7	70,427	502	.7
1961	25,435	255	1.0	44,490	734	1.7	69,925	989	1.4
1962	24,484	385	1.6	43,756	1,185	2.7	68,240	1,570	2.3
1963	23,488	279	1.2	42,571	756	1.8	66,049	901	1.4
1964	23,467	312	1.3	41,815	1,996	4.8	65,252	2,308	3.5
1965	22,214	695	3.1	70,000[d]	2,849	4.0	92,214	3,544	3.8
		1,313[e]	5.8					4,162[e]	4.5

[a]Add Pleasant Grove, Northwestern to city population.

[b]Add North School, park trees to city population.

[c]Add Pleasant Grove, Northwestern to private population.

[d]Add North, Maple Grove, Forest Road to private population.

[e]Addition of 618 field diagnosis from Program B-II (unsprayed low-value park elms) increase 1965 losses.

The 1965 evaluation repeated the same problem areas and commented that, "research goes on and may bring solutions, meanwhile losses continue high in the areas outside the control zone," and with the passing of these trees and the resulting drop in beetle population "our control measures may become more effective."[146] The natural circumstances of Lansing as an isolated control zone that grew by annexation emerged as a key factor. Looking back over the program, Phillips considered that:

> Had it not been for the annexations, we probably could have held the losses down so that the Council would have supported the program without question.[147]

As it was, the high losses stretched the capacity of the control program each year. The high concentrations of dying elms in the undeveloped areas of the city took survey time that might have cleaned out the small derelict patches in the "old city."

In budget conferences, the City Council tended to evaluate the program in terms of dollars. Any new equipment, techniques, or policy changes that tended to hold down the costs while providing much the same service to the people were favorably considered.

From time to time, as the costs of the Dutch elm disease control program continues to climb, people asked the question, "Why bother to continue such an expensive program?" These sort of questions are not new to those in government, and 170 years ago Edmund Burke gave an answer that is still worth considering. "Mere parsimony is not economy. . . . Expense, and great expense, may be an essential part of true economy."[148]

The city or county that decides to save money by not implementing a control program may save for a few years, but experience has shown that

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[146]Departmental Report, 1965.

[147]Opinion expressed by David Phillips in conversation on Dutch Elm Disease Program, March 11, 1966.

[148]Edmund Burke as quoted by John Bartlett, The Shorter Bartlett's Familiar Quotations, ed. Christopher Morley, Louella D. Everett, and Kathleen Sproul (New York: Permabooks, 1956), p. 47.

the disease will soon leave them with dangerously dead trees over the public highways that are their responsibility. More critical than finding funds for removal, is the possibility of such a tree falling onto the highway and causing an accident resulting in property damage, injury or death. Resulting lawsuits could cost the public far more than a timely control program.[149]

George Parmalee, curator, Department of Physical Plant at Michigan State University, estimated the cost of removing the 2,250 elms on campus at $450,000. Replacements even of fair size that could be moved, balled, and burlapped would raise the total to over $1,000,000. Further, he feels that the preservation of the elm as a species depends on the maintaining and defending of "elm refuges."[150]

In his annual report to Mayor Murninghan, Charles Hayden states that while Dutch elm disease expenses have been higher than ever before:

> Nevertheless, there seems to be no alternative than for continuing to wage an effective fight, to save as many of our wonderful shade trees for as long as possible, by removal of dead elms which would otherwise serve as breeding places for beetles that spread the disease.[151]

In the summer of 1965, the department's reasons for continuing the program were explained to the people by The State Journal: "Lansing has a tiger by the tail." If it lets go and discontinues the program, 80,000 healthy elms may be wiped out. If it continues to fight it can expect to spend $100,000 per year into the future. While the value of the individual trees is hazy, the removal cost is real. At an average of $70 per tree, it could cost $5.6 million dollars to lose them all. "We could fight fifty years at that rate."[152]

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[149] Opinion expressed by C. A. Boyer in conversation, March 24, 1966.

[150] Parmalee, "The Dying American Elm. . . ."

[151] Annual Report of the Parks and Recreation Director to Mayor Max E. Murninghan, 1965, p. 4.

[152] The State Journal (Lansing), August 19, 1965.

In more formal language the department summed up the reasons in five key statements:

1. Lansing still has over 85,000 public and private healthy elms.
2. Michigan State University statistics reveal an annual loss of 30 percent to 35 percent in local woodlots without a control program.
3. Research programs may help in the future, but won't help Lansing if the elms are gone.
4. Protection of public and private property from the menace of dead elm trees.
5. Preservation of property values over the city as a whole is important. DEAD TREES DON'T BEAUTIFY A CITY.[153]

In summary, the disease control program to minimize losses is still worth continuing because the alternative — wholesale removal of our elms — would cost far more than the control program is costing and "dead trees can't beautify a city."

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[153]Departmental Statement, July 1965.

CHAPTER VI

CONCLUSIONS AND IMPLICATIONS

In this study of the background and development of the Dutch Elm Disease Control Program in Lansing, a number of definite conclusions emerge. These conclusions follow from the evolution of policies and procedures and from an evaluation of the entire ten-year period of the study. They deal with the nature of such control programs, and with the nature of the people who initiate the programs and carry them out.

The study as a whole implies certain principles which have value, not only for Dutch elm disease control programs, but for other similar programs which must combine technical and administrative procedures into a program capable of generating sustained public support.

Summary

Dutch elm disease was discovered shortly after it reached the United States and its potential danger to the native elms was soon determined. Scientific research on the state and federal levels developed technical control programs which were put into action on the local levels as the disease spread from the Eastern states into the Middle West.

When the Dutch elm disease was discovered in Lansing in 1956 the community was ready to act decisively. Lansing as a community had a strong tradition of municipal tree care as a service to the people. The forestry program had started in 1915 and had been developed in a systematic manner under the direction of professional foresters. This forestry staff applied the technical knowledge from the state programs to the established administrative procedures of the department. As the Lansing program evolved it was based on scouting, sanitation, and spraying; subjected to critical evaluation; and presented to the park board, elected officials

and the general public through continuous public relations information. Although the city has continued to grow and the number of diseased trees has continued to increase, the city has sustained the program for ten years.

Evaluation of the Ten-Year Program

Evaluation of Technical Procedures

The basic techniques of scouting included taking and processing samples and making suitable records. This work was generally well done, but although more scouts and vehicles were added each year the scouting program was always under pressure, always extended beyond the anticipated level.

While the removal of diseased trees was given highest priority in the sanitation program, removal of dying elm trees and systematic trimming of deadwood were more difficult on park lands and extremely difficult on private lands. There were more changes in the tree removal policies than in any other part of the program. A very important factor in this policy history was the desire of the city council to protect the people from the hardship of removing the condemned trees wholly at their own expense. Originally all such trees were removed at city expense. In 1963, the rising cost of the program caused the council to modify the program, but still to protect the man with the large, costly tree. Finally, in 1965 an even larger portion of the cost was passed to the property owner but the policy was still designed to favor the man with the big tree, or a large number of smaller ones. This phase of the program involving as it does, thousands of trees and property owners, is the most difficult to administer.

The spraying program was never extended to private property. As a result its procedures were tested and standardized early in the program and have run very well since. Protection of sprayed trees is not perfect but rates as good, compared to losses of the rest of the program. This success is a matter of good technique, good equipment, and careful, diligent public relations.

The public relations program has been excellent. Cooperation by the press and patient face-to-face contact by members of the department at all levels has given the people an awareness of the program and its importance to the community. The program has been challenged on details of procedure or policy, but never on the basis of community need.

Evaluation procedures have improved in later years as more data was available. Departmental policy of systematically recording and analyzing each year's operation has built up a sound foundation of technical data and policy decisions for the continuing program. As the program grew in size, more planning and evaluation was done in departmental conferences. The need for group communication sharpened and refined many of the concepts and resulted not only in improved records and reports, but also in better training of the administrative staff.

Evaluation of the program as a whole requires a decision as to the standards to be used. If the program is judged by the various technical standards offered by Knight (1 percent), Carter (2 percent), Dietrich (2-1/2 percent),[1] then it was a failure in 1961 when the losses went over 1 percent, or a failure in 1964 when the losses went over 2 percent. Since both Park Board and City Council supported the staff in sustaining the program, there must be another set of standards implicit in the decision. The standards of administration rather than the technical standards, are the significant ones.

The administrative standards are based on the impact on the community over the long run; standards based on the <u>value</u> of the remaining trees rather than the <u>price</u> of the program. Consideration of these administrative standards explains why the program continued after the losses had exceeded the critical percentages of the technical standards. The people and their councilmen have continued to support the program, not on the basis of the original policies and procedures, certainly not on the basis of saving all the elms, but rather on the basis that to give up could be a greater cost

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[1] See Chapter V (p. 92), footnotes 139, 140, 141.

to the community than the cost of continuing the program; that the alternatives, as presented to them by the professional staff, were more expensive, and less satisfactory than the program.

Neither Park Board, nor City Council changed the major direction of the program during the ten-year period, although only two councilmen and one Board member served during the entire ten-year period of the study.[2] This infers that the departmental staff was successful in communicating the goals, policies and procedures of the program to each group of new officials. Except for the special council fund for the removal of trees on private land, all major policies and procedures originated with the professional staff, were refined in conferences and were supported by the officials of the city and the people of the community.

This confirms the position of Peter H. Rossi that "the function of citizen participation is to support, the function of the professional is to create."[3]

The administrative problem faced by the department and the city officials was not eliminating the disease, but eliminating the menace of dead trees. Preserving the trees was a cheaper way of eliminating the future removal costs. When Dutch elm disease invades a community someone must bear the cost. The administrative decision is twofold. (1) Shall the payment be made over five years or over 50? A control program can make the difference. And (2) how shall the cost be shared between the community as a whole and the individual property owner?

Re-examination of the long-run community goals shows that the preservation of the trees is a public trust, but protection of the people is also a major trust. Such protection should include not only physical protection from falling deadwood, but also from the financial burden of removing many

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[2]City of Lansing, Council Proceedings, 1956-1965.

[3]Peter H. Rossi, "Theory, Research, and Practice in Community Organization," Social Science and Community Action, ed. Charles Adrian (East Lansing: Michigan State University, 1960), p. 19.

dead trees in a short time. Whether the burden is absorbed in part by city programs and spread over the community through the taxes, or falls with full impact on individuals who happen to have large trees, depends on the policy decisions of the elected officials. These men will surely be guided by their degree of understanding the full measure of the control program and its alternatives.

Therefore, since the program in Lansing did not stop when the technical standards were not met, but was continued on the basis of the administrative standards, as interpreted to the Council and the people by the professionals on the department staff, it follows, not that administration alone can control the Dutch elm disease, but that both technical and administrative procedures are essential to the pattern of a sustained control program.

A review of the literature on control of the Dutch elm disease shows emphasis on identification (scouting), sanitation, and spraying programs.[4] However, a number of more recent articles, usually from men in the field, stress the importance of public relations.[5] Except for the literature on community action, few have commented on either the need or the technique of the evaluative or administrative aspects.[6] The importance of these administrative factors is well known to successful administrators, but these factors are not stressed in the published literature. And often, the published materials are all that is available to communities beginning a control program.

General Conclusions

Natural Factors

The large number of native elms in the Lansing area, the isolated

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[4]Butcher, Campana, Carter, Hart, Janes, Knight, May, Parmalee, Pirone, Wallner, Welch and Whitten.

[5]Cath, Dietrich, Meyers, Toledo Municipal League, Van Camp, Warren, and Wysong.

[6]Adrian, Altshuler, Boyer, Doell, Rossi, Suggitt.

situation of the city and the annexation pattern during the years of the study required the control program to be a continuous effort over an extended period of time. Costs of control in the annexed areas were very high.

Technical Factors

The program must be based on scientific research and include the technical procedures of scouting, sanitation and spraying. Good information based on research and experience was available from the Plant Industry Division and the State Universities.

Administrative Factors

The program should include systematic evaluation and public relations and the administration should be placed under the responsibility of a professional. Professional leadership was an established tradition in Lansing. The people of the community and the elected officials were accustomed to supporting the departmental staff in solving just this sort of large-scale community problem. Both the Gypsy moth control program in 1954 and several subsequent mosquito control operations had been developed and sustained by the professional staff and trained employees of the department. Several generations of Lansing residents had seen the department move effectively in routine operations and in times of emergency to meet the needs of the community. Because of the good record of past performance in this specific area of community service the professional staff had gained the confidence of the community leaders.

Timing Factors

To give effective control at a cost level that the community will accept, the control program must be started <u>before</u> the "crisis stage." Paradoxically, men will not ordinarily act with vigor until they perceive a crisis. The average citizen perceives a crisis on the personal level — <u>his</u> tree is dying — ; the councilman or mayor perceives it on the community level — his constituents call him that <u>their</u> trees are dying; but the professional

should perceive it on the state and national level — through his professional reading, through professional groups and conferences, through professional friends in other cities. It was this functioning of the departmental staff, reaching beyond the community to draw upon the experience of others, through books, letters, and conversations, that had initiated, prepared, and planned the Lansing program. By the time the first trees were condemned the technical materials had been gathered and adapted to the local situation. Records were made to serve as the basis for further action. Problems were solved as they developed by systematic means rather than relying completely on the intuitive judgment of a single man. Most important, the necessary trials and testing needed to adapt methods and procedures to the local conditions were completed in the early phases of the program when the scale of operations were small. Cost of trial and error was small, new techniques could be tried without fear of jeopardizing the entire operation. Supervision of the program was continuous.

Community Support Factors

The control program should have the support of the general public and their elected officials. Community support is related to the ability of the administrators, not only technical competence, but the ability to "get along" with others. Altshuler stresses the importance of clarity of standards and strength of conviction to the influence of the professional on community decision-making:

> . . . if those who proposed a project were perceived as moral and realistic men, their passionate conviction as technicians was likely to persuade doubting laymen to support their project.[7]

This ability to persuade, and to summon support is slowly built through many small decisions over time. If the confidence of the elected officials and general public is gained on an individual basis, it comes to mean the support of the community as a whole. More than this, there is a linkage

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[7]Alan A. Altshuler, The City Planning Process: A Political Analysis (Ithaca, New York: Cornell University Press, 1965), p. 77.

that ties the individual professional's image to that of the department. A young man may speak with the authority conferred by the accumulated years of departmental experience codified into policy. As he grows older, his personal influence grows and this personal image in turn confers additional support upon the department as a whole. These linkages are subtle, but the administrator should be aware of the advantages and encourage the growing process through training of the professional staff under his responsibility.

Implications for Control Programs

Control programs must be approached on a technical basis. Only through knowledge of the technical aspects of the particular problem can an appraisal be made and the significant questions asked. What is the problem? What potential does it have to hurt the community? What can be done about it? Consideration of the nature of the Dutch elm disease, how many elm trees the city had, and the alternate costs of control measures formed the base for the decisions in Lansing. Once the program had been appraised as short run or long run, once the potential danger has been estimated, then plans for men and equipment were made accordingly.

Control programs must include administrative functions. Technical advice and recommendations cannot be implemented without an administrative framework. Since administrative procedures are an integral part of a community program, and since evaluation procedures, records systems, and public relations contacts cannot be developed quickly, they should be recognized and established as standard operating procedures. All departments should strive to develop a framework of administrative procedures, especially those of planning, evaluation, and public relations so that new problems may be met by securing the most recent technical data and applying it to the specific community situation. The best administration procedure cannot solve the problems alone, but it takes longer to develop an administrative tradition in which the people have faith than to acquire technical data for a specific problem.

Professional skills are needed to develop and sustain a control program. One of the qualifications of a professional is the ability to operate on the technical level. To be able to abstract the essentials of a technique from the available information, to weigh and measure the various social and economic patterns within the community and translate this data into technical and administrative proposals which may be communicated, weighed, and ultimately used to change the formal patterns of the community. The importance of this ability to verbalize and legitimize must not be underestimated if the departmental programs are to meet the needs of the people as a whole. Technical evaluation will be accepted as a basis for decision-making to the extent that it reflects an awareness of the real but often unarticulated values held by most of the people. This ability to profess is the principal difference between the technician and the professional in the same specialized field. It is a combination of ability and attitude, not decided or guaranteed by formal education or field experience, but a quality that, when present in a man, can be shaped and enriched by both.

Control programs must have sustained public support. Since the legitimate function of government is to serve the people of the community, any control program must provide a recognizable service. Since the average citizen or elected official may not recognize community problems in the early stages, or be able to deal with them in the technical complexity of today's urban situation, these special problem areas: traffic, public safety, public service, and parks and recreation, are placed under the responsibility of professionals. As administrators of the public trust, these men have an obligation to plan and operate their departments to meet immediate problems. As professionals they are also obliged to reach beyond the community to the state and national levels. Only in this way will they become aware of the future problems that may be faced by their community. To the extent that they are able to earn the confidence of the community as individuals and as a department, they will have the community

support for the programs which are necessary to protect the community interest.

These programs will be based on the best technical information available, adapted through administrative procedure to the specific requirements of the community. This is the work that must be done by the professionals, for only such men will be able to earn the public support necessary to sustain the control programs.

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APPENDICES

APPENDIX A

BIOGRAPHICAL SUMMARIES OF KEY ADMINISTRATORS

H. Lee Bancroft Born December 7, 1890

Education: Lansing Central High School, 1908
Michigan Agricultural College, B.S., 1913, Forestry

Departmental Service: Founder and builder of the Department of Parks and Recreation 1914-1957. Park system grew from 50 acres to 1,500 under his administration. Retired June 30, 1957.

Community Service: Served on the City Planning Commissions of 1921, 1938.

Professional Organizations: Charter member and Past President, Michigan Forestry and Park Association; American Institute of Park Executives, Vice President 1933, President 1935, Honorary Fellow 1953; National Recreation and Park Association, named to the Board of Trustees as one of two men from Michigan 1965.

Remarks: He had an early reputation as a public speaker. This undoubtedly helped him build his "community image" from the very beginning.

Carl G. Fenner Born July 23, 1899

Education: High School, 1917
Michigan Agricultural College, B.S., 1923, Forestry

Departmental Service: Assistant City Forester, 1923-1956; Assistant Superintendent and City Forester, 1956-1957; Director of Parks and Recreation and City Forester, 1957-1959; Director of Parks and Recreation 1959-1962; Retired June 30, 1962.

Professional Organizations: Member and Secretary, Michigan Forestry and Park Association (15 years); National Shade Tree Conference President 1955.

Remarks: Pioneered to build one of the modern forestry programs known on national level. Worked with tree scientists at Michigan State College and the United States Department of Agriculture in a number of research projects.

Theodore J. Haskell Born October 11, 1926

Education: Royal Oak High School, 1944
Michigan State College, B.S., 1949, Forestry
Michigan State University, M.S., 1966

Departmental Service: Forestry staff 1949-1956, Assistant City Forester 1956-1959, City Forester 1959-1962, Assistant Director of Parks and Recreation and City Forester 1962-1964, Assistant Director of Parks and Recreation 1964 to present.

Community Service: Mayor's Committee on River Improvement 1963 to present, Grand River Watershed Council 1965 to present.

Professional Organizations: International Shade Tree Conference, Board of Governors 1957-1958, 1962-1963, 1965-1966; Michigan Forestry and Park Association; Michigan Academy of Science, Arts, and Letters; American Institute of Park Executives; National Recreation and Parks Association.

Remarks: Visiting lecturer, Michigan State University, 1960, 1962, 1964, 1965, 1966.

David Phillips Born May 20, 1930

Education: Port Huron High School, 1948
Michigan State University, B.S., 1957, Municipal Forestry and Park Management

Departmental Service: Forestry staff 1957-1959, Forestry Technician 1959-1963, City Forester 1964 to present.

Professional Organizations: Michigan Forestry and Park Association, International Shade Tree Conference.

Charles G. Hayden Born January 12, 1909

Education: Lansing Central High School, 1926
Albion College, 1926-1928
University of Wisconsin, B.A., 1930

Departmental Service: Assistant Director of Parks and Recreation 1957-1962, Director of Parks and Recreation 1962 to present.

Community Service: City Council, 2 terms, 1947-1953; Chairman Charter Commission, 1953-1955.

Professional Organizations: American Institute of Park Executives, National Recreation and Park Association, Michigan Forestry and Park Association.

APPENDIX B

DUTCH ELM DISEASE ORDINANCE: EXCERPT FROM LANSING CODE

SECTION 23-18 — Dutch Elm Disease — Maintaining Favorable Conditions as Nuisance, to be Abated Upon Notice

Any elm tree affected with the fungus Ceratostomella ulmi, Dutch Elm Disease, so-called, or any dead or dying elm tree, or stored elm logs, or elmwood, which could harbor or become a breeding place for the American or European bark beetle, the two known carriers of the disease, is hereby declared to be a public nuisance and it shall be unlawful for any person to maintain the same on their property after proper notification, as provided in C.L. 1948, section 286.251 et seq., and the Michigan Department of Agriculture Regulation No. 613 as amended.

SECTION 23-19 — Same — Removal from City Property

Any such trees, or elmwood, located on public lands within the limits of the city shall be removed at city expense, in accordance with section 23-2.

SECTION 23-20 — Same — Entry of City Personnel

The city forester, or authorized employees of the park board, may enter upon private property to make such field inspections, including the removal of specimens for laboratory analysis, as may be necessary to determine the presence of the fungus and to locate any elm material that might serve as a breeding place for bark beetles.

SECTION 23-21 — Same — Notice to Owner When Infection Discovered, Action by City Personnel

After determination of infection by the laboratory of the plant industry division of the Michigan state department of agriculture, the city forester may, by written notice, give the property owner a definite time, but not less than ten days, to remove, treat, and dispose of the infected tree by fire or approved practice. If the work is not satisfactorily completed by that time, then and in that case, the city forester, authorized employees of the park board, or authorized agents may enter upon the property and remove, treat, and destroy the infected tree, by fire or approved practice.

SECTION 23-22 — Same — Removal of Dead Branches or Trees

After inspection of private property, the city forester may require, by written notice, the removal of dead or dying limbs of elm trees, or of dead

elm trees or of elmwood stored on the property. If such notice is given, the owner will be given a reasonable and definite time to comply with the order, but not less than ten days. If the work is not satisfactorily completed within that time, then and in that case, the city forester, authorized employees of the park board or authorized agents may enter upon the property, make the necessary trimming or removals, properly treat the wood and bark and make proper disposal of the same; provided that, all or part of the costs involved in the treating or removal of dead or dying elm limbs, elm trees, or elmwood stored on the property, when such treating or removal is performed by the city forester, authorized employees of the park board or authorized agents, shall be assessed against the property on the next general assessment roll of the city. (Ord. No. 61, Section 1, July 8, 1963)

Amendment note — Ord. No. 61, Section 1 amended Section 23-22 to add the proviso regarding assessment of costs.

APPENDIX C

RECOMMENDED STANDARDS FOR EVALUATING CHEMICAL TREATMENT AS A CURE FOR DUTCH ELM DISEASE[1]

1. Trees treated for cure must be known to be infected with the Dutch elm disease fungus. If the trees became infected naturally, the fungus must be cultured and identified by a mycologist or plant pathologist before treatment. If the trees are inoculated deliberately before or after treatment the fungus must be recovered from inoculated but untreated trees (controls without treatment) at a point removed from the point of inoculation.

2. The evidence indicating cure must show significant differences between diseased (or inoculated) trees chemically-treated and those diseased (or inoculated) not treated. Differences between treated and untreated trees must be directly comparable in terms of symptoms expressed and degree of development of the fungus.

3. Tests should be carried on over a period of two or more years.

4. Tests should involve a sufficiently large number of trees to have statistical (ordinarily several hundred trees).

5. Data presented to substantiate claims for cure should be specific in how they were obtained, so that observations may be duplicated and verified by others.

August 9, 1961

Joseph Dietrich
John Neill
Richard Campana

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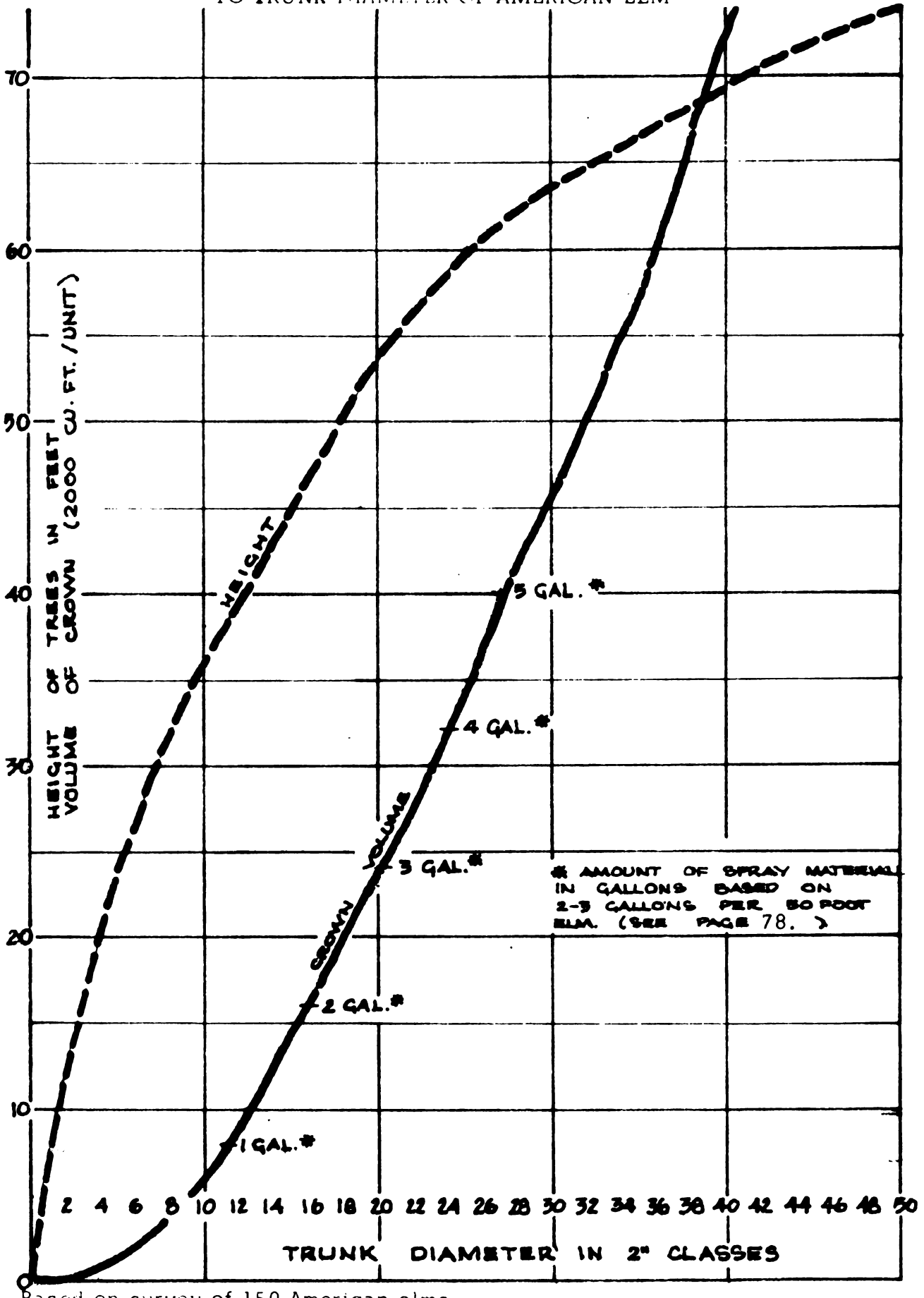
[1]Committee Report, Proceedings International Shade Tree Conference, August 9, 1961.

APPENDIX D

RELATIONSHIP OF HEIGHT OF TREE AND CROWN VOLUME TO TRUNK DIAMETER OF AMERICAN ELM



Based on survey of 150 American elms.