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THE VIEWPOINT OF THE ARNOLD ARBORETUM
ON THE DUTCH ELM DISEASE

AMONG the various problems in the conservation of tree life in the United States the Dutch elm disease takes precedence. It is the most urgent because the Dutch elm disease is potentially capable of destroying practically all of our elms so long as it remains within our borders and because, failing intelligent, persistent, aggressive action, the time that remains to us during which we still retain the power to get rid of it is uncertainly and perilously short. The question before us is how best can we continue to meet the problem.

From the outset the Arnold Arboretum has advocated complete eradication of the Dutch elm disease from the United States as the guiding principle, for, after due consideration of its nature and its means of spread, no other measure seemed to offer any hope if our elms were to be saved. Added knowledge and experience during the ensuing years have but served to strengthen our earlier convictions. So, in considering future action, we continue to unreservedly support the policy of eradication, with its complement of sanitation, which has been sponsored by the Federal Government and facilitated by State cooperation. Indeed, we are more strongly convinced than ever that it offers the only chance of preserving the priceless national heritages, the retention of which is at stake—our American elms of all species.

The federal machinery for combating the Dutch elm disease, as set up in 1933, consists of—(1) a laboratory at Morristown, N.J., for diagnosis and research; (2) offices at White Plains, N.Y., East Orange, N.J. and Stamford, Conn. which are responsible for (a) scouting, (b) eradication, (c) elm sanitation and (d) technical and educational projects. Organized cooperation, in addition, is afforded by the States



in which the disease is known to occur.

The actual working of the machinery has been as follows. The infected area and a surrounding 10-mile zone have been mapped and divided into administrative units; each unit is methodically scouted during the growing season in search of trees that exhibit suspicious symptoms; specimens from these trees are sent to the Morristown laboratory for diagnosis; if the diagnosis reveals the disease, the trees involved are condemned; the condemned trees are then promptly cut down and burned. Throughout the year a sanitation corps is occupied with a systematized removal of dead and decrepit elms within the affected area regardless of whether or not they carry the Dutch elm disease fungus; the purpose of this is to destroy the breeding places of the insect carriers and accessory breeding places of the fungus. Additional important service is rendered by the Morristown laboratory by researches that are designed to afford extended knowledge of the disease and its means of spread.

Speed in the detection and removal of diseased trees is of great importance, because such trees are not a menace in the spread of the disease until the "carrier" insects have had a few weeks in which to breed in the decrepit stems and branches. It should be added that continuity of the eradication service over a period of years is obviously of paramount importance because of the fact that several years may elapse before symptoms appear in an infected tree. But by dogged persistence the number of cases can surely be reduced to zero, just as has been true of an eradication campaign against citrus canker in Florida. Beginning there in 1915, at which time canker was present in 26 counties, the last diseased tree was found in 1927, and no instance of citrus canker in Florida has been found since that time.

Up to the summer of 1935 deductions as to the probable success of this policy were based solely on biological data derived, mainly, from European investigations; no practical tests of its efficacy had been previously made anywhere. Not until the fall of 1934 had a comprehensive survey of the range and the intensity of the occurrence of the Dutch elm disease in America been completed; and not until the spring of 1935 had those trees in which symptoms had become manifest been cut down and burned. With the compiled experiences of 1935 now available, however, we have, for the first time, statistical data against which to check our theoretical conclusions.

It will, I think, be generally agreed that in discussing these data we may dismiss without further reference the single, small infection spots respectively in Virginia, Maryland, Indiana, northern Connecti-



The Old Landcaster Elm

Courtesy of the Massachusetts Forest and Park Association

cut, and the two small spots in Ohio. All told they have involved fewer than 40 trees; the situation in each has been, and is being, closely watched and is well in hand. Moreover, except for Old Lyme, Connecticut, the origin of the infections in these locations is known with reasonable certainty and suitable restrictions on importations have been enforced by the Federal Quarantine Office to guard against the likelihood of further new outbreaks. Our main concern is with the infection area radiating out about 45 miles from the port of New York, an area embracing contiguous portions of the states of New York, New Jersey and Connecticut.

The results of the work of eradication and sanitation in this New York area, as revealed by the compilations of 1934 and 1935, afford great encouragement. Certainly a good beginning has been made towards the objective. Thus the number of trees showing symptoms of the disease appears to have been somewhat fewer in 1935 than in 1934—in round numbers for 1935, say 6,700 trees, that is, less than one-half of one percent of the elm population of the area involved. What a contrast with the doleful efforts to get rid of the chestnut blight! Then, too, the condemned trees were cut down and destroyed so promptly in 1935 that probably comparatively few of them were factors in a continuation of the epidemic. It is just in that feature, too, that the sanitation program helps enormously. Again it is highly significant that scarcely a dozen infected trees were found in the surrounding 10-mile scouted zone—a zone tentatively regarded in 1934 as infection-free. How many of these were really infected before the eradication project was begun, in other words, how many were really new cases, is purely a matter of surmise. The same question arises with all the other cases found in 1935. This uncertainty is obvious when we remember that the disease may be present in a tree for five years before external symptoms are manifest and that our acquaintance with it in the New York area covers a period of less than three years. As for the sanitation project, hundreds of thousands of dead and moribund elms have been eliminated—a very impressive step towards the goal of utterly removing the breeding places of beetle agents preponderantly responsible for spreading the disease-producing fungus.

Taking all these facts into consideration my own opinion of the results of the eradication work to date is that they indicate a substantial reduction of the disease in the New York area. At the very least we can confidently assert that combined Federal and State efforts have apparently held the disease in check and greatly lessened its potential spread. Surely there is good reason to conclude that we prob-

ably can save our elms if we will, and that the cost of the effort will be vastly less than that of removing dead trees if the disease be allowed to take its course.

Further evidence of the success of our eradication policy is afforded by comparing the status of the Dutch elm disease situation in America with that of western Europe—a region in which eradication has not been attempted. This will also help us to visualize the anticipated fate of our elms if we do not or cannot eradicate the Dutch elm disease. A few extracts from two recent reports (1935) which we owe to the British Forestry Commission will suffice to give us the picture. Quoting—“In Utrecht 64% of the elms have already been removed, in Rotterdam 55%.” “Between Louvain and Diest, a distance of 28 kilometres, there was originally a more or less continuous avenue of elms, about $\frac{3}{4}$ of which have been felled as a result of the disease, and about $\frac{1}{3}$ of those remaining are dead.” “This is comparable to the Newport Bishop’s Stortford area in England.” An estate in Worcester, England, “reports that 500 elms are to be felled in 1935 owing to the disease.” As for England the British Forestry Commission finds “it is still impossible to recommend the planting of elms.” As for Holland “it is assumed that all the present stand of elms in Holland, with the exception of a few specimens of resistant varieties, will eventually succumb to the disease.” In other words, the elm situation in western Europe appears to be hopeless. The conclusion is surely inescapable that, unless eradicated, the Dutch elm disease is not likely to be less disastrous in America than it is proving to be in Europe, knowing as we do from repeated tests that American species of elms rank among the most susceptible of all elms.

And now let us turn briefly to the question of costs. That matter must be faced regardless of what is done about our elms, whether we try to save them or leave them to their fate. It may readily be admitted that considerable cost will be incurred in carrying through the eradication project because it will take several years to bring it to completion. But costs are sure to be *many, many* times greater if we do not eradicate the Dutch elm disease. To my mind there is no alternative. So-called “control,” short of eradication, may defer the loss of our elms; but the conclusion in Holland, where essentially such a measure is being practiced, is that the elms will eventually go. Actually such “control” may be more costly in the aggregate than doing nothing at all. If our elms be allowed to die there will be unavoidable costs of removal and these will be huge because of the vast number of trees involved. Then there will be costs of replacements,



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