Seeing Trees, Thinking Forests: Urban Forestry at the University of Toronto in the 1960s

Joanna Dean

Joanna Dean teaches History at Carleton University.

"We look at the present through a rear-view mirror. We march backwards into the future."

—Marshall McLuhan

The ice storm of January 1998 started like any other ice storm. A mass of warm moist air from the Gulf of Mexico was wedged between two layers of Arctic air hugging the St. Lawrence and Ottawa River valleys. Snow fell, turned to rain in the warm layer of air, and was superchilled—still liquid but a few degrees below zero—as it passed through the lower Arctic layer. It froze immediately where it landed. Ice storms are not unusual in eastern Canada; they normally last only a few hours and leave a delicate gloss on tree branches and a more deadly layer of ice on highways. But this storm did not stop. A high-pressure system in the Atlantic kept the moist Gulf air rolling into Canada for five days. Freezing rain encased trees in a brittle casing of ice that thickened with each passing day until, after a total of 80 hours of intermittent freezing rain and drizzle, the weight of the ice brought branches and whole trees crashing down on roads, hydro wires, and houses.[1] The storm cut off power to more than four million Canadians, and, as life came to a standstill in Montreal and Ottawa, and farmers struggled to care for livestock, it served as a sharp reminder of our dependence upon electricity. Seven hundred thousand people were still without power two weeks after the onset of the storm, and the Canadian Forces were called in to supply emergency services to rural communities.

Once candles were lit and generators hooked up, many of us turned our attention to the heavily burdened trees. Sugar bush owners listened to the crashing of massive limbs from the interior of their bush. Those of us who lived among old trees in the city became newly aware of the branches

overhead, their size, and also their vulnerability. We kept anxious watch as the storm progressed and ice built up, and flinched every time the wind blew. In my neighbourhood, in the heart of Ottawa, 100-year-old trees bent under the weight of the ice, and the wiser among us wore hard hats when venturing out under the branches. Fallen limbs blocked driveways and sidewalks. One remaining American elm, a tall survivor of Dutch elm disease in the 1960s, creaked in the wind, a thing of terrible and dangerous beauty.

Immediately after the storm, a number of fundraising campaigns were launched to replace fallen trees. City trees matter to people; in a built environment of concrete and asphalt, trees are evidence of the beauty and power of the natural world.[2] The mayor of Ottawa quickly raised $120,000 for tree planting, and my own neighbours responded generously to a smaller community drive. Dozens of volunteers planted new trees the following spring along the highway. But as the drama of the ice storm faded, I became aware of a more complex politics. We might agree in principle that trees are very important, but in practice we often decide that a tree will not fit on this particular block, in this yard, or on that corner. Open space in a city is valuable, and the places available for trees are often contested spaces, wanted for driveways, soccer fields, or signage. As trees grow, they compete with paving, overhead wires, and sidewalks. And city budgets are tight: city councillors might agree with their constituents that trees matter, but many balk at the cost of planting, watering, and pruning them. One city councillor refused to support a tree-planting initiative in 2006 saying, "We should let nature take its course. The squirrels of Ottawa probably help plant millions of trees every year."[3]

As a historian I naturally turn to the past to understand the present, so after the ice storm I turned to the archives to understand the politics of the urban forest. In the city archives I learned that street trees were planted by residents at the end of the 19th century. Street tree planting was part of the same civic beautification that led to city parks. Avenues of trees lent some grace to the raw young city, and, in the days before air conditioning, shade trees provided a very practical benefit. The city of Ottawa offered a subsidy to homeowners who planted and protected them. These trees have not always been well cared for: documents in Library and Archives Canada show that the Ottawa Horticultural Society launched a campaign for professional management of street trees in the 1920s, and thousands of trees were cut down and trimmed in the 1930s and 1940s. And far from being "natural," city trees have been subject to the fickle winds of fashion and the grandiose ambitions of politicians: the records of the National Capital Commission show that Ottawa planted pink crab apple trees in the 1960s in saccharine imitation of Washington's cherry blossoms.[4]

My research has proven useful in arguments with penny-pinching politicians, but like much historical research, it has now taken on a life and purpose of its own. I have come to think that the way that we think about city trees says a lot about our relationship with the natural world. The vast majority of Canadians live in cities, and while we might dream of pristine forests in Clayoquot Sound, most of us live in a compromised urban forest made up of Norway maples, Japanese lilacs, cedar hedges, Kentucky bluegrass, black squirrels, and starlings. We know this ecosystem intimately: the bright green of new leaves in the spring, their cool shade in midsummer and the dampness underfoot as they decay in the fall. It is not always pleasant: we sneeze when we breathe in tree pollen and leaf mould, and we have to make hard decisions when roots find their way into

basements, and squirrels find their way into attics. It can be harder to love the tree next door, especially when it blocks our view or makes us sneeze, than it is to care about more distant forests, and over time I have come to think that it is the way that we live with the urban forest—those trees, shrubs, and animals just outside our front door—that best reveals our underlying attitudes toward the natural world.[5] The history of our shifting attitudes to this ecosystem, what might be called the social and cultural history of the urban forest, has become the focus of my work.

This chapter focuses on an important transition in this history: the period when we started talking about the urban forest rather than the individual tree. In the 19th and early 20th centuries, city trees had been variously called street trees, shade trees, or ornamental trees, and they were cared for by arborists. In the 1960s a Canadian forester coined the term "urban forest," and over the following decades the term caught on among professionals across Europe and North America, until in 2006, the eminent *Journal of Arboriculture* was renamed the *Journal of Arboriculture and Urban Forestry*. This was more than just a linguistic shift; it signified an entirely new way of conceptualizing the place of trees, and, one might argue, the place of nature, in a city. When we move from seeing one tree, in its individual identity, to a whole forest of such trees, something has changed in our understanding of these trees, or this forest, and our place in the midst of them. Street trees, shade trees, and ornamental trees are individual trees subordinated to the needs of the city; the urban forest is an ecological community connected with the larger natural world.

Erik Jorgensen, a professor of forest pathology at the University of Toronto, is widely acknowledged as the author of the term "urban forest."[6] Willem (Bill) Morsink, a young forestry student starting graduate studies in September 1965, recalled the moment the term was coined: "I went into Erik's office and suggested that my master's in forest pathology would be modified to be on tree diseases in municipal settings. He agreed and after tossing the idea around for five minutes Erik concluded that the new direction must have forest in it because I was doing a forestry masters, and that my focus would be on tree diseases in urban settings. Hence the oxymoron: urban forestry."[7]

The Power of the Oxymoron

Research into the University of Toronto Archives shows that the term grew out of a lively counterculture (what Jorgensen recalls as the "happening scene" at the university during the sixties), a traumatic environmental disaster (the decimation of urban elm trees by Dutch elm disease), and the intellectual ferment created by media guru Marshall McLuhan. The sixties are now iconic as the decade of hippies, drugs, and rock and roll. The record left by the University of Toronto's student newspaper, *The Varsity,* is by comparison a little disappointing, at least in the early years of the 1960s: until 1965 most of the news stories in the student paper are as dull as the accompanying advertisements for business suits. There are hints of an emerging student activism in articles on the war in Vietnam and news of student protests in Berkeley, but it was only in the second half of the decade that the campus erupted in a series of protests, teach-ins, and sit-ins. As Graeme Wynn recalls in his chapter of this volume, it was not until 1969 that environmental concerns began to find real expression in Pollution Probe meetings in the basement of Sidney Smith Hall.

A flood of new faculty members were, however, shaking up the sleepy academic halls in the early 1960s; the best known was media analyst Marshall McLuhan. In the 1950s and 1960s,

McLuhan catapulted into international celebrity with a series of iconoclastic studies of popular culture: *The Mechanical Bride* (1951), *The Gutenberg Galaxy* (1962), and *Understanding Media* (1964).[8] He was hailed by writer Tom Wolfe in 1965 as "the most important thinker since Newton, Darwin, Freud, Einstein and Pavlov."[9] The quote later appeared in a *Playboy* profile, "Marshall McLuhan—A Candid Conversation with the High Priest of Popcult and Metaphysician of Media." It was typical of McLuhan, a conservative Catholic professor, to be profiled in *Playboy*. McLuhan's catchphrases were on everybody's lips: everybody—or at least everybody who was at all hip—agreed that "the medium is the message," even if they were not entirely sure what that meant. This was McLuhan's intent: his metaphors were richly contradictory, intended to provoke and disarm, but with a kind of basic truth at the core. "The medium is the message" was a flip phrase for a profound idea: conventional wisdom held that the medium, such as print or television, was simply the vehicle for content, but McLuhan argued that the medium itself had a subliminal impact. The content, he said, was like a piece of meat thrown by a burglar to distract the watchdog of the mind, while the medium itself worked upon our psyche. His central point, that media have an influence on thought and behaviour independent of their content, intrigued a generation coming to terms with television. Not everyone was dazzled by McLuhan; one academic said, "He is swinging, switched on, with it, and now. And he is wrong."[10] Many were perplexed by McLuhan's rhetoric and many were annoyed. But it was fashionable to be perplexed in the sixties, and McLuhan forced even those who disagreed with him to consider the impact of television, radio, and advertising. His work reverberates once again today as we come to terms with the power of the Internet. As William Turkel's chapter in this volume shows, digital media are altering the practice of history.

To ensure that the University of Toronto did not lose its star, the president created the Centre for Culture and Technology as a place for McLuhan to hold court.[11] Students either loved or hated him. His lectures roamed far from any stated theme, and he delighted in unsettling his audience with "probes," witty aphorisms intended to unsettle received wisdom. As his assistant at the centre, Tom Cooper recalled, "He often challenged students to see their own pedantry, their own conventional wisdom, their own mediocrity of thinking and often he'd return papers saying, 'One idea' or 'Two ideas' at the top, with no other comment. In other words, he was only interested in good new ideas."[12] This inspired some students, but it frustrated those who were not keen to have their mediocrity exposed, and preferred a professor who stuck to his course outline.

Trees brought Erik Jorgensen and Marshall McLuhan together: the oak trees around McLuhan's home needed care and Jorgensen was called in to give advice. They got along, and the forester was invited to sit in on the media guru's lectures. McLuhan encouraged fellow academics to break out of the "one thing at a time" of logical thought and out of the confines of their disciplines. His message met fertile ground in the young Danish forester, who was frustrated by the industry orientation of the university's Faculty of Forestry.[13] It had been created in 1907 in the face of declining Ontario timber supplies to provide scientific management for timber production, but had never succeeded in having much impact on government policy or industry practices.[14] Jorgensen, trained in sustainable forest management in Denmark, was frustrated by the Canadian focus on the production of lumber and wood fibre for pulp and paper, the lack of reforestation policies, and

the neglect of the environmental and community benefits of forests. Cross-appointed as a forest pathologist between the Faculty of Forestry and the Department of Botany, he was already straddling two disciplines, and his offices were with the botanists, physically as well as philosophically removed from other foresters. Jorgensen's students remember him fondly as a "scrapper," someone willing to shake things up.[15] He was open to new ways of approaching the world and welcomed McLuhan's iconoclasm. Jorgensen later recalled that McLuhan's lectures taught him new respect for the arts: "He was the first to open my eyes up to the folly of viewing things in scientific terms, of having to prove everything two times."[16]

McLuhan was, for his part, intrigued by Jorgensen's concept of the urban forest. As a master of oxymorons (like "global village"), McLuhan appreciated the simple perversity of the term: urban meant skyscrapers, automobiles, and concrete, while forests were the epitome of the natural and the wild. Tying the two concepts in one phrase was jarring, and so, he told Jorgensen, it was bound to catch on. One evening, Jorgensen was invited to McLuhan's popular evening seminar at the Centre for Culture and Technology to speak about the urban forest. He recalls with amusement that he said only about three sentences before an enthusiastic McLuhan broke in and took the stage.

Combating Dutch Elm Disease

If Marshall McLuhan gave Jorgensen the encouragement to think outside the box, it was an environmental event, the devastation wrought by Dutch elm disease, that set Jorgensen thinking. Dutch elm disease hit Canada in the 1940s: it is thought to have originated in the Himalayas and appeared after the First World War in Europe, where it was named for the Dutch scientists who identified it. The disease crossed the Atlantic in elm veneer and packing crates, and appeared in the United States in the 1930s and Quebec in 1944.[17] It is caused by a fungus, *Ophiostoma ulmi,* passed from tree to tree on the winged bodies of elm bark beetles and underground through natural root grafts. The fungus clogs the sap-conducting vessels under the bark, causing affected parts of the tree to wilt and eventually the entire tree to die.

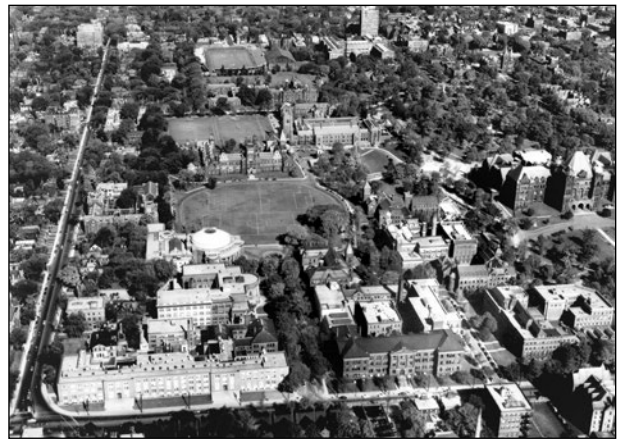
The impact was devastating. The American elm, *Ulmus americana,* was one of the most popular street trees in the northeastern United States and Canada. Graceful and fast growing, with a tall narrow trunk and high arching branches, elm trees were ideally suited for shading city streets, and long rows of closely planted elm trees lined avenues in most cities. When Dutch elm disease appeared, city trees were already stressed by the expanding urban infrastructure: utility wires cut through their branches and asphalt paving choked their roots. The fashion for long, uniform avenues of elm, while aesthetically pleasing, created an artificial monoculture and laid the conditions for dramatic losses. Beetles skipped easily from tree to similar tree, and the fungus moved between intertwined root systems under the pavement. Some towns lost most of their tree canopy to the disease.

There were more than 100,000 elms in metropolitan Toronto in the 1960s, 10 percent of all street trees. Jorgensen calculated that 90 percent of the trees in the groves on the University of Toronto campus were American elm (Figure 13.1).[18] The disease approached Toronto from two directions. The first wave from the United States crossed the Great Lakes through Windsor and

Niagara Falls, and moved east along Lake Ontario toward the city.[19] The second wave from Quebec hit Ottawa in 1948 and moved west. In 1951, a few diseased trees were identified in Toronto and removed. In 1956, several more sites were identified.[20] In 1959, the first case appeared on the University of Toronto campus; five trees died in the summer of 1960. Brigadier J. F. Westhead at the Superintendent's Office sent seven tissue samples to the Forestry Laboratory in Maple to be tested, and in September 1960 received the first positive identification.

As the university's specialist in forest pathology, Erik Jorgensen was asked by the Dean of Forestry to look into the situation. He reported with alarm:

Figure 13.1 UNIVERSITY OF TORONTO CAMPUS WITH EXTENSIVE ELM GROVES, 1950



In the 1950s, 90 percent of the trees on the University of Toronto campus were American elm, so the appearance of Dutch elm disease in 1959 was cause for alarm.

Source: University of Toronto Archives, 2005-20-5M6 a-1988-0012-(01).

> These findings are of a most serious nature from many different points of view as a large percentage of the trees on campus are elms. If unchecked the disease will no doubt decimate the elms in a very short time. Only one tree was suspected in the summer of 1959 and the spread of the disease to kill five large trees in 1960 is alarming. The loss of the elms will not only alter the many beautiful views on the campus, but the dead trees will present a hazard to pedestrians, cars and buildings which cannot be tolerated.[21]

He recommended a combination of sanitation and chemical spray. Elm trees were to be inspected regularly through the summer, and dead branches and dead trees removed immediately. In addition, all elm trees were to be sprayed in the early spring and possibly also in the late summer with a pesticide: an emulsion of dichloro-diphenyl-trichloroethane (DDT).

Jorgensen's advice followed accepted practice. Sanitation was crucial. The native elm bark beetle, *Hylurgopinus rufipes* and the smaller European elm bark beetle, *Scolytus multistriatus,* lay eggs under the bark of diseased elm trees; the larvae mature and, after pupating, covered with fungus spores, they fly to healthy trees which they infect when they begin feeding on bark and twigs.[22] Removal of all dead wood with bark on it, including standing dead trees and firewood, breaks the cycle. Spraying healthy trees with DDT in the early spring (when the trees are still dormant) leaves a residue on the bark and twigs that kills any remaining beetles. DDT was a miracle pesticide of the Second World War, credited with saving the lives of many thousands of soldiers by killing the insects that spread malaria and typhus. It was widely applied in the immediate postwar era against a broad range of insects, and seemed especially well suited for Dutch elm disease.[23]

The usual practice was to mix 20 pounds of DDT in 100 gallons of water, and spray about 25 gallons of the mixture on each tree.[24]

In June 1961 an inspection tour revealed three more infected trees. Jorgensen recommended a more radical removal of all weakened elm trees. Two more infected trees were found in July, and Jorgensen advised against plans to plant a new elm on campus. Two weeks later another two infected trees were identified, but Jorgensen was still optimistic: "Although it still is at least one year too early to claim that the disease has been checked in its spread on campus it is very encouraging to note that only two 'new' infections could be found on this inspection tour. The finding may emphasize the importance of continued removal of diseased and weak elm trees. At the present it looks as if we are in time for the preservation of the major part of our elms on the old campus."[25] His optimism was premature, however, and the spread of the disease picked up through the 1960s.

Elm bark beetles do not respect property lines, and Jorgensen and Westhead began to lobby for concerted action with metropolitan Toronto municipalities. They invited politicians as well as representatives from parks, public utilities, conservation authorities, and consulting firms to a meeting on January 17, 1962. As Westhead explained in a general invitation, "Rather than the University of Toronto becoming a small island of elm trees and attempting to fight off all inroads, it is hoped by this meeting that we would be able to arouse interest throughout Toronto and adjacent areas in order that a combined and cooperative effort could be put forward for the common good."[26] About 60 representatives attended the meeting and a fact sheet prepared by Jorgensen was passed out. They established a steering committee, the Dutch Elm Disease Control Committee for Metro Toronto and Region.[27]

Shade Tree Research at the University of Toronto

With the support of this committee, Jorgensen began to lobby in the fall of 1962 for the creation of a forest pathology laboratory at the University of Toronto, focused on shade-tree diseases. Members of the control committee suggested that funds of $20,000 per year, over three years, might be raised from the public, and they proposed that the university provide space and start-up funding.[28] The Dean of Forestry, J. W. B. Sisam, was supportive and space was found in June in an old dairy plant, the Borden Building on Spadina Avenue, for the new Shade Tree Research Laboratory (Figure 13.2).[29] The control committee, however, had overestimated its fundraising capacity: over the next few years it raised only a few thousand dollars annually. Although the university provided start-up operating grants, and Jorgensen used grants for his forest pathology work, finances were precarious during the early years. In 1966 the university provided steady funding, and Jorgensen's laboratory became the first laboratory devoted to shade tree research in Canada.[30]

The focus upon shade trees was a departure for a faculty of forestry. The first dean, Bernard Fernow, a pioneering figure in North American forestry, had published a book on city trees in 1910, and some University of Toronto forestry graduates had found work managing urban parks, but city trees were generally cared for by arborists, who were trained to prune and manage individual trees. Rather than study forestry, they studied aboriculture, a branch of horticulture, in a college or agricultural school, where the emphasis was upon practical skills.[31] The Ontario Agricultural College, for example, affiliated with the University of Toronto until 1964, offered a degree in horticulture. Jorgensen had a great deal of respect for arborists, and was eager to bring arboricultural knowledge

and skills into the discipline of forestry. He quickly broadened the scope of his forest pathology laboratory to include arboriculture: "It was soon recognized [. . .] that if the program was to be effective, its purpose should be extended to deal with shade tree problems in general, cultural and ecological as well as pathological."[32] Plans were made to hire an aboriculturalist in addition to an entomologist and pathologist. In October 1962, Dean Sisam suggested to Jorgensen that the Shade Tree Research Laboratory might be a first step to "lead some forestry undergraduates into the area of arboriculture." Jorgensen replied that the establishment of arboriculture as a field of interest at the university would "prove fertile in future developments of forestry teaching at the University of Toronto."[33]

Figure 13.2 EXAMINING MAPLE SEEDLINGS

University of Toronto forest pathologist Erik Jorgensen and graduate student Willem Morsink examine maple seedlings. The creation of the Shade Tree Research Laboratory at the University of Toronto made shade trees suitable subjects for scientific research and created the context for a new way of thinking about these trees. City trees were seen as elements of a natural ecosystem rather than decorative components of the built environment.

Source: Reprinted with permission from The Globe and Mail.

In a number of ways, Dutch elm disease facilitated the expansion of the forestry program into what had been arboricultural concerns. The complex etiology of Dutch elm disease demanded the interdisciplinary research science of a university laboratory. The need for municipal involvement in the treatment of the disease called for the management skills of university graduates. The wide public concern about the disease (and not incidentally the potential for future political support and funding) justified university expenditures in this area. As Dean Sisam noted in a letter to Jorgensen in May 1963, "The development of a more comprehensive program of Shade Tree Research was justified, I believe, in view of . . . the recognition of a fairly wide interest in these matters by individuals, government departments, and associations—an interest that might well be mobilized increasingly to support the program as it develops."[34]

It helped that the university was in an expansionist and interdisciplinary mode in the 1960s, flush with new students and new funding.[35] In 1961 the entire curriculum of the Faculty of Forestry had been placed under review, creating exciting new possibilities. In a 1963 memorandum, Jorgensen made his argument for expansion into arboriculture in two, quite contradictory ways, arguing first that shade trees were different enough to warrant special study, and second that they were similar enough that research into shade trees would yield findings for resource forestry. "Shade tree problems tend to be different from those involved in forestry due mainly to the relatively high individual value of the shade tree, which allows for the application of intensive methods in tree care and in pest and disease control. Furthermore many foreign tree species and native trees species of little commercial value to the forest industries have found a place as important shade tree species,

adding to the variety and number of shade tree problems. A study of these problems may very well lead to findings of importance, not only in arboriculture, but in forestry as well."[36] Jorgensen proposed expansion into graduate research in arboriculture, undergraduate training in arboriculture and parks management, and a one-year diploma course in parks management for forestry or horticulture graduates, as well as the continuation of extension courses offered in the evenings and summers.[37] Sisam was supportive, but letters suggest that Jorgensen's ambition was outpacing the Dean's budget, if not his enthusiasm for the new field.[38]

The Shade Tree Research Laboratory created the context for a new way of thinking about city trees. The close collaboration with the Dutch Elm Disease Control Committee made academics at the lab particularly aware of the managerial and political aspects of urban forest research. Jorgensen's cross-appointment in the Department of Botany and work as a forest pathologist made him sensitive to the interplay of insects, fungae, and microorganisms, and Dutch elm disease was a sharp reminder of the complexity of the urban ecosystem. The interdisciplinary nature of the research created the conditions for a more ecological outlook on city trees.

The Toxic Ecology of DDT

In 1962, Rachel Carson identified much more frightening ecological connections with her best-selling book *Silent Spring*. She explained in chilling detail how humans were poisoning the world with synthetic pesticides that had been so indiscriminately applied, and were so persistent, that they could be found throughout the ecosystem: "They have been found in fish in remote mountain lakes, in earthworms burrowing in soil, in the eggs of birds—and in man himself. . . . They occur in the mother's milk, and probably the tissues of her unborn child."[39] Chief among these deadly chemicals was DDT. In a chapter titled "And No Birds Sang," Carson explained how the application of DDT against Dutch elm disease had decimated song birds. She quoted a letter written by a housewife to an ornithologist in 1958:

> Here in our village the elm trees have been sprayed for several years. When we moved in here six years ago there was a wealth of bird life . . . After several years of DDT spray the town is almost devoid of robins and starlings; chickadees have not been on my shelf in for two years, and this year the cardinals are gone too . . . It is hard to explain to the children that the birds have been killed off, when they learn in school that a Federal law protects the birds from killing or capture. "Will they ever come back?" they ask; and I do not have the answer. The elms are still dying and so are the birds. *Is* anything being done? *Can* anything be done? Can *I* do anything?[40]

Carson described a natural world that was deeply interconnected. A pesticide that killed the elm bark beetle also worked its way into earthworms, and hence into songbirds. Carson concluded that the elm must be sacrificed: "It would be tragic to lose the elms, but it would be doubly tragic if, in the vain attempts to save them, we plunge vast segments of our bird population into the night of extinction."[41] She argued that a rigorous program of sanitation would slow the progression of the disease to manageable proportions.

The impact of *Silent Spring* in Canada was immediate. The city arborist in Montreal abandoned spraying in September 1962, citing the impact on birds and other insects. "Spraying should be curative, not preventative," he argued, "Indiscriminate use of insecticides is as unscientific, and as dangerous, as indiscriminate use of any powerful medicine or drug." In October, the Toronto Parks Commission's George T. Bell followed suit. After spending $6 million over five years, he announced that the battle was lost, and focused the commission's resources on the removal of dead trees. On February 13, 1963, the Metropolitan Toronto Parks Commissioner concurred, and advised that spray sterilizes birds, without effectively protecting the trees.[42]

Jorgensen had been publicly recommending the use of DDT prior to the publication of *Silent Spring,* and was initially reluctant to give it up.[43] Although he saw the forest as an ecological unit, his primary sympathies appear to have remained with the trees, and it was difficult to abandon them. He felt that the municipal authorities who were abandoning DDT were motivated by the bottom line, rather than ecological concerns. Municipalities had been reeling under the costs of Dutch elm disease control, and fears about DDT provided an excuse to stop spraying. To combat this line of thinking, Jorgensen made calculations showing that a consistent program of sanitation and limited spraying would be cheaper for a municipality in the long run. In an article published in *Canadian Audubon Magazine* in late 1962, he argued for a careful continued use of DDT. He conceded that early indiscriminate spraying caused severe damage to wildlife—and cited *Silent Spring* in his footnotes—but argued that the impact could be reduced with dormant spraying of DDT with carefully directed mist blowers, used only on valuable stands and in preventative sprays. Mist blowers used less DDT and resulted in less runoff. Jorgensen also suggested that another less toxic chemical, methoxychlor, could be used where bird loss occurs. His *Audubon Magazine* article was reprinted by the Shade Tree Research Laboratory for public distribution. On January 3, 1963, when a concerned member of the public asked if he agreed with Rachel Carson, Jorgensen said ambiguously that Carson's view "is shared by me, provided that the use of chemical sprays has been added to the program until sanitated areas are no longer threatened."[44] He did point to alternatives: "You will have noted that DDT which when used in excess is reported to have killed birds, particularly robins, can now be substituted by methoxychlor which is far less toxic to birds and other wildlife." He repeated this argument in a symposium held by the control committee on January 28, 1963.[45] A presentation by A. W. A. Brown at the same symposium may have given him pause, however. Brown said that even mist blowers had a devastating impact upon bird populations because of the accumulation of DDT:

> DDT is so persistent in the soil that it takes over 10 years to degrade down to 10 per cent of its original level. As robins die, their territories are usually invaded by other robins, most of which are then doomed themselves to be killed in these death traps. And so we have the horrible situation where it is tough on the robins, and the citizenry makes it tough on the public servants, and we are simultaneously faced with the certainty of bird mortality and the uncertainty of obtaining complete protection of the sprayed trees.

Brown concluded that methoxychlor is a less-toxic alternative, allowing trees to be protected while "those responsible can sleep of nights without worrying about a post-spray harvest of dead birds."[46] After the symposium, however, Jorgensen continued to recommend chemical sprays

without identifying the chemical. As late as 1965, in the first newsletter of the Ontario Shade Tree Council, he recommended the use of a "chemical spray" with a mist blower or hydraulic equipment to protect valuable trees.[47]

It may seem odd to us that Jorgensen, someone sufficiently environmentally aware to develop urban forestry in the first place, would continue to recommend DDT (or any chemical pesticide, for that matter) in the wake of *Silent Spring*. But he was not alone. It was only after the discovery in the mid-1960s that DDT was dramatically reducing the numbers of bald eagles and other raptors, and after the U.S.–based Environmental Defense Fund in the late sixties began to use legal proceedings to publicize the dangers of DDT to birds and humans, that opposition to the pesticide became universal.[48] In 1972, DDT was banned in the United States, and Canada followed suit in 1985. Jorgensen's loyalty to pesticides reminds us more generally that a commitment to "the environment" does not in itself tell us how we are to respond on environmental issues. Consider DDT itself, and how our thinking about it has changed. Malaria kills one in twenty children in sub-Saharan Africa, and DDT is one of the few effective controls for mosquitoes, the vector for the disease. The incidence of malaria soared in the 1990s when African countries banned DDT; even South Africa, with its advanced health care system, was unable to develop an effective alternative. When the United Nations organized a global treaty against persistent pollutants, malaria experts insisted on the need for DDT for disease-vector control, and the Stockholm Convention on Persistent Organic Pollutants exempted DDT for this use. In September 2006, the World Health Organization endorsed the indoor residual spraying of DDT. This very limited use of DDT—the amount used for indoor residual spraying for an entire country is the same as the amount sprayed on one cotton field in the 1950s—has the cautious support of some environmental organizations, including Environmental Defense, although there is still concern about the long-term consequences.[49]

The debate shows the moral and political complexity of environmental issues. Even Rachel Carson was reluctantly willing to give up on elm trees in order to save song birds, and most of us, especially in the face of evidence that DDT was not really effective against the elm bark beetle, would agree. But for a forester like Jorgensen, who was passionate about trees and not convinced of the dangers of DDT, the decision to abandon the elm trees to the depredations of the elm bark beetle was a difficult one.

In the face of public concerns, Jorgensen increasingly turned his attention to alternatives. In December 1963, P. J. Ward, chief forester of Great Lakes Paper Company, recommended that he read *Silent Spring* and Jorgensen replied, somewhat testily: "For your information, I am enclosing a reprint of one of my papers on DED [Dutch elm disease] which will confirm that Miss Carson's *Silent Spring* is already on our bookshelves."[50] He explained that his lab was looking into less-toxic chemicals, and pursuing alternative approaches to the disease, including injections of chemicals, biological control using sterilized beetles, trapping of beetles with sex attractants, and research into beetle parasites. In the spring of 1964, he described the lab's research for a local newspaper: "Experiments are being carried on to find a substitute for DDT which controls the disease but is not fatal to birds."[51] K. Stewart, a forest entomologist retired from the federal Department of Forestry, joined the laboratory as a research associate, and focused on alternatives to DDT: organochlorines such as methoxychlor and carbaryl (Sevin) and the injection of systemic insecticides such as Bidrin and Metasystox."[52] Research conducted by another member of the laboratory,

D. N. Roy, into a systemic fungicide, Lignasan BLP (carbendazim phosphate) injected into the elm roots led to an article co-authored with Jorgensen and a patent registered to the University of Toronto. Dutch elm disease control programs today use sanitation and the injection of a fungicide into the root systems, although the expense of this approach limits application to valuable trees.[53]

Urban Forestry Goes Global

It was out of this environmental crisis and response that the phrase "urban forest" emerged. The conditions had been set for a rethinking of city trees by the application of forestry skills of scientific research and scientific management to their study, by the interdisciplinary nature of the laboratory research, and by the public debates around DDT. It was in September 1965 that Bill Morsink joined the laboratory as a graduate student interested in municipal trees, and Jorgensen named his course of study "urban forestry." By 1966, Dean Sisam was using the term: instead of suggesting programs in arboriculture and parks management, he used the term urban forestry.[54] The 1967 statement of the Shade Tree Research Laboratory also used the term, equating it to arboriculture: "There is a plan to enlarge the program relating to arboriculture, or what we have called Urban Forestry as personnel and funds become available."[55] The 1968–69 university calendar stated that the Shade Tree Research Laboratory was to provide graduate and undergraduate training in urban forestry. In 1969, the Faculty of Forestry became the first in Canada to offer a course in urban forestry as part of its undergraduate curriculum, as an elective in the fourth year.[56] Urban forestry was also offered as a field of study at the graduate level, with one student assistantship provided by Ontario Landscape Contractors Association. Seven students had graduated by 1982.[57]

Morsink's M.Sc. Forestry thesis gave urban forestry its first extended explication in 1967. He locates urban forestry between the intensive approach of horticulturalists and the laissez-faire approach of forestry. The first part of his thesis is a broad-ranging discussion of the issues facing the urban forest; he quotes urban theorists such as Lewis Mumford: "the future task of urbanization is the reestablishment in a more complex unity, with full use of resources of modern science and technology, of the ecological balance that originally prevailed between city and country in the primitive stages of urbanization." The second half of the thesis is a case study of Etobicoke's urban forest.[58]

Jorgensen began to give conference papers on the subject, some of which were published by the Shade Tree Research Laboratory, and we can observe the growing stature of the term in his paper titles: "Approaches to Shade Tree Research at the University of Toronto" in 1967, "Urban Forestry in Canada" in 1970, "Towards an Urban Forestry Concept" in 1974, "Urban Forestry in the Rear View Mirror" in 1986, and "The History of Urban Forestry in Canada" for the first Canadian Urban Forest Conference in 1993.[59] His work had an evangelical element. Jorgensen was not only defining the urban forest but also proselytizing to a world that needed to understand the importance of trees in the city. In a 1969 newspaper interview Jorgensen defined urban forestry as "a specialized branch that has as its objective the cultivation and management of city trees." He explained that the urban trees acted as air conditioners, cooling, humidifying, and cleaning the air, and even suggested, with reference to urban unrest plaguing the United States, that long-lived urban trees might create a sense of stability.[60]

The term became international in June 1968 when Jorgensen gave a paper in India, following which the Commonwealth Forestry Association endorsed research into tree planting in urban areas. The United States Secretary of State for Agriculture requested a copy of Jorgensen's paper for the President's Advisory Committee, and a National Urban Forestry Council was created in the United States.[61] The term was later adopted by the European Union.[62] Ironically, the term nearly disappeared at the University of Toronto. In 1971, Dean Sisam, who had supported Jorgensen in his funding battles, retired. Jorgensen left the university two years later for the Canadian Forestry Service, and although he was replaced by another professor of urban forestry, John Andresen, the Shade Tree Research Laboratory lost its independent identity when it was transferred to a location in the Faculty of Forestry. When Andresen left in 1987, budget cuts meant that his position was not filled.[63]

Conclusion

Jorgensen's role in the creation of urban forestry is widely acknowledged and his definitions are widely cited. But the power of the term is such that definitions are almost unnecessary. As Marshall McLuhan realized, the term "urban forest" contained its own internal dynamic. One associate at the Centre in Culture and Technology explained the power of an oxymoron:

> McLuhan was very fond of Dada, of absurdism, fond of the interplay of things that were not meant to be connected at first. He was fond of cutting loose the connections in systems. He often said that you had to have a certain play between one part and the other parts of whatever it is that you're playing with. It has to give. If you don't have enough distance between the two objects of your attention, then there is no play, no place for the mind to make a discovery. It's so vacuous, there's nothing to play about.[64]

The power of the urban forest lay in the disjuncture between the urban and the forest. The term confronts us with the yawning perceptual divide between the urban built world and the forested natural world. As McLuhan told Jorgensen, this disjuncture would rub people the wrong way, and by doing so it would force them to think again. It continues to shake up our thinking about cities and forests, and the wider world. The forest growing between sidewalk and street, between telephone wire and sewer line, offers a better metaphor than we might care to realize for the modern environment.

Discussion Questions

1. When did people start referring to city trees as the urban forest? How did this new term reflect changing attitudes to trees in the city?
2. Is an urban forest the same as other forests?
3. The author states: "it is the way that we live with the urban forest—those trees, shrubs, and animals just outside our front door—that best reveals our underlying attitudes toward the natural world." Do you agree?

4. How did attitudes toward the urban forest shift in the 1960s in light of Dutch elm disease and *Silent Spring?*
5. How can we reconcile the detrimental and beneficial aspects of DDT? Are there any circumstances in which we should consider using it?
6. Why did Marshall McLuhan think that oxymorons were powerful? Compare the oxymorons "global village" and "urban forest."
7. How is a science, such as forestry, influenced by the social, intellectual, and economic climate?

Notes

1. See David Phillips, "The Worst Ice Storm in Canadian History?" Environment Canada http://www.msc-smc.ec.gc.ca/media/icestorm98/index_e.cfm (accessed November 20, 2007). The storm centred on Montreal, Kingston, Cornwall, and Ottawa, although freezing rain affected a much larger area as far west as Kitchener, Ontario, as far east as Nova Scotia, and south into parts of New England.

2. For an interesting discussion of the public enthusiasm for tree planting and the corporate manipulation of that enthusiasm, see Shaul Cohen, *Planting Nature: Trees and the Manipulation of Environmental Stewardship in America* (Berkeley: University of California Press, 2004).

3. Councillor Gordon Hunter, quoted in "City to Consider Environment Committee Plan to Plant 100,000 Trees over Four Years," *Ottawa Citizen*, December 2, 2006.

4. See Joanna Dean, "'Said Tree Is a Veritable Nuisance': Ottawa's Street Trees, 1869–1939," *Urban History Review/Revue d'histoire urbaine* XXXIV no. 1 (Fall 2005): pp. 46–57; "Ottawa's Central Park: Esthetic Forestry vs Ornamental Gardens," in Proceedings of the International IUFRO Conference "Woodlands—Cultural Heritage" May 3–5, 2004, Vienna, Austria, *News of Forest History*, III, pp. 36–37 (January 2005): pp. 21–30. For the history of the urban forest, see Thomas Campanella, *Republic of Shade: New England and the American Elm* (New Haven: Yale University Press, 2003) and Henry W. Lawrence, *City Trees: A Historical Geography from the Renaissance through the Nineteenth Century* (Charlottesville: University of Virginia Press, 2006).

5. See William Cronon, "The Trouble with Wilderness, or Getting Back to the Wrong Nature," William Cronon, ed., *Uncommon Ground: Rethinking the Human Place in Nature* (New York: W. W. Norton & Co., 1995): pp. 69–90.

6. See Erik Jorgensen, "Urban Forestry in Canada," *Proceedings of the 46th International Shade Tree Conference*, 43a–51a, 1970. Among others, G. W. Grey and F. J. Deneke, *Urban Forestry* (Toronto: John Wiley and Sons, 1977) suggest that the "concept of urban forestry was introduced first at the University of Toronto in 1965," p. 6. Most recently, Cecil C. Konijnendijk, Robert M. Ricard, Andy Kenney, and Thomas B. Randrup credited Jorgensen in "Defining Urban Forestry—A Comparative Perspective of North America and Europe," *Urban Forestry and Urban Greening* 4 nos. 3–4 (2006): pp. 93–103.

7. Erik Jorgensen, interview by author, December 6, 2005, Guelph, Ontario. E-mail correspondence from Bill Morsink, 2005. See also Morsink's recollection in *Ontario Urban Forest—Scrapbook II: Growing Interest and Concern* (Toronto: Ontario Urban Forest Council, 2006): p. 113.

8. Marshall McLuhan, *The Mechanical Bride: Folklore of Industrial Man* (New York: Vanguard Press, 1951); *The Gutenberg Galaxy: The Making of Typographic Man* (Toronto: University of Toronto Press, 1962); and *Understanding Media: The Extensions of Man* (Cambridge, MA: MIT Press, 1964).

9. Tom Wolfe, "What if He is Right," *New York Magazine*, cited in "Marshall McLuhan—A Candid Conversation with the High Priest of Popcult and Metaphysician of Media," *Playboy*, (March 1969): pp. 53–74, Eric McLuhan and Frank Zingrone, eds., *The Essential McLuhan* (Toronto: Anansi, 1995): p. 234.

10. Amherst College professor Benjamin MeMott, quoted in "Marshal McLuhan," *Playboy*.

11. Claude Bissell, *Halfway up Parnassus: A Personal Account of the University of Toronto, 1932–1971* (Toronto: University of Toronto Press, 1974).

12. Cited in *Forward through the Rearview Mirror: Reflections on and by McLuhan,* Paul Benedetti and Nancy DeHart, eds. (Cambridge, MA: MIT Press, 1997): p. 80.

13. See Mark Kuhlberg, "'By Just What Procedure Am I to Be Guillotined?' Academic Freedom in the Toronto Forestry Faculty between the Wars," *History of Education* 31 no. 4 (2002): pp. 351–70.

14. Erik Jorgensen, interview by author, December 6, 2005, Guelph, Ontario, and Jorgensen, "The History of Urban Forestry in Canada," *Proceedings of the First Canadian Urban Forest Conference,* Winnipeg, May 30–June 2, 1993.

15. Bill Morsink, interview by author, October 28, 2006, Toronto, Ontario.

16. Erik Jorgensen, interview by author, December 6, 2005, Guelph, Ontario.

17. Campanella, *Republic of Shade,* pp. 148–53.

18. "Province Wide Attack on Elm," *Toronto Star,* December 28, 1962.

19. "Dutch Elm Disease," Publication 1010, Forest Biology Division, Research Branch, Canadian Department of Agriculture (June 1958).

20. L. T. White, "Distribution and Severity of Dutch Elm Disease," paper presented to Symposium on Shade Trees, Toronto, Canada, January 28, 1963, available in University of Toronto Archives (UTA) A2004-0025/013 (07) "Professor Jorgensen, Chair, Forest Pathology."

21. Erik Jorgensen, "Dutch Elm Disease on the Campus at the University of Toronto," September 30, 1960, UTA, A2004-0025/13 (07) "Professor Jorgensen, Chair, Forest Pathology."

22. M. Hubbes, "The American Elm and Dutch Elm Disease," *Forestry Chronicle* 75 no. 2 (March/April 1999): p. 265.

23. See Thomas R. Dunlap, *DDT: Scientists, Citizens, and Public Policy* (Princeton: Princeton University Press, 1981).

24. "Dutch Elm Disease," Publication 1010, Forest Biology Division, Research Branch, Canadian Department of Agriculture (June 1958): p. 9.

25. Erik Jorgensen to J. B. Westhead, "Tree Conservation Program" June 26, 1961, UTA A2004-0025/013 (07) "Professor Jorgensen, Chair, Forest Pathology."

26. Invitation included with correspondence in reply to Westhead from J. W. B Sisam, January 17, 1962, UTA A2004-0025/13 (07) "Professor Jorgensen, Chair, Forest Pathology." See also "U of T Spends $11,000 to Save 290 Elm Trees," *The Globe and Mail,* January 19, 1962.

27. The control committee expanded into the Ontario Shade Tree Council three years later with a broader mandate, and is still active as the Ontario Urban Forest Council.

28. Memorandum to Erik Jorgensen from J. W. B. Sisam, October 1, 1962, UTA A200-0025/13 (03).

29. The title of Sisam's book, *Forestry and Forestry Education in a Developing Country: A Canadian Dilemma,* suggests that he was uncomfortable with the resource emphasis of Canadian forestry.

Bill Morsink confirmed that Sisam was a conservationist, and sympathetic to Jorgensen's aims. Bill Morsink, interview with author, October 28, 2006, Toronto, Ontario.

30. See the correspondence, especially between J. W. B. Sisam, F. R. Stone, VP Administration, and Erik Jorgensen in UTA A2004-0025/013 (03) "Shade Tree Research Laboratory, 1963–."

31. See Erik Jorgensen, "Arborist," Occupational Information Monograph published by the University of Toronto Guidance Centre (1967) in UTA A2004-0025/013 (03) "Shade Tree Research Laboratory, 1967–." He defined 19 institutions offering programs in horticulture; some of those affiliated with a university offered degrees.

32. Shade Tree Research Laboratory, undated, unsigned three-page document, in UTA A2004-0025/013 (03).

33. "This [shade tree research program] implies a long-term development and as such could definitely have positive values, as for example, i) creating a greater interest in forestry problems among large urban populations, and ii) providing a research environment that might well lead some forestry undergraduates into the area of arboriculture and park management, as well, of course, as solving the many shade tree problems." Memorandum to Erik Jorgensen from J. W. B. Sisam, October 1, 1962. Jorgensen's comments are in his reply to Sisam in a memorandum dated October 12, 1962, UTA A2004-0025/013 (07).

34. See J. W. B. Sisam to Erik Jorgensen, May 15, 1963, UTA A2004-0025/013.

35. Enrolment at the Faculty of Forestry had to be capped after 1969 because growth had been so rapid, from 103 students in the faculty in 1966 to 200 in 1969.

36. J. W. B. Sisam and Erik Jorgensen, January 1963, UTA A2004-0025/13 (07) "Professor Jorgensen, Chair, Forest Pathology."

37. Memorandum to J. W. B. Sisam from Erik Jorgensen, February 18, 1963, UTA A2004-0025/013 (03). It appears that nothing came from this proposal.

38. Erik Jorgensen to J. W. B. Sisam, February 9, 1967, Re: The Shade Tree Research Laboratory, marked confidential, and J. W. B. Sisam to Erik Jorgensen, February 24, 1967. In UTA A200-0025/013 (03) "Shade Tree Research Laboratory, 1966–."

39. Rachel Carson, *Silent Spring* (New York: Houghton Miffin, 1962): p. 24. For background on Carson see Linda Lear, *Rachel Carson: Witness for Nature* (New York: Henry Holt & Co., 1997). For a discussion of the reception of Carson's work, see Priscilla Coit Murphy, *What a Book Can Do: The Publication and Reception of Silent Spring* (Amherst: University of Massachusetts Press, 2005) and Michael B. Smith, "Silence Miss Carson!: Science, Gender and the Reception of *Silent Spring*," *Feminist Studies* 27 no. 2 (2001): pp. 733–52.

40. Carson, *Silent Spring,* pp. 97–98.

41. Carson, *Silent Spring,* p. 99.

42. See *The Globe and Mail,* "Elm Spraying Ends," September 1, 1962; "City Elms at Crisis, Park Chief Warns," October 12, 1962; "Our Lost Elms," October 13, 1962; "Lost Battle," October 29, 1962; "Dutch Elm Spray: Early Bird Might Get Sterilised: Parks Head," February 13, 1963.

43. Erik Jorgensen, letter to the editor, *The Globe and Mail,* January 24, 1962.

44. Erik Jorgensen to Ruth Thompson, January 3, 1963, UTA A2004-0025/013 (07) "Professor Jorgensen, Chair Forest Pathology."

45. Erik Jorgensen, "Costs and Economy," Paper presented to the First Annual Symposium on Shade Trees, Toronto, January 28, 1963, UTA A2004-0025/013 (07) "Professor Jorgensen, Chair, Forest Pathology."

46. "Problems in Chemical Control," by A. W. A. Brown, UTA A2004-0025/013 (07) "Professor Jorgensen, Chair, Forest Pathology."

47. Erik Jorgensen, "Dutch Elm Disease: What Can be Done About It," *Canadian Audubon Magazine* (November–December 1962), reprinted by the Shade Tree Research Laboratory. Newsletter of the Shade Tree Council, no. 1, January 1965, Section 4. "Outline of DED Control Program" by Erik Jorgensen, p. 8, UTA A2004-0025/013 (03) "Shade Tree Research, 1963–." Jorgensen's student Willem (Bill) Morsink also recommended the use of DDT in his 1967 thesis. See Morsink, "Municipal Tree Management in Urban Areas" (M.Sc. thesis, Faculty of Forestry, University of Toronto, 1967): p. 47.

48. See Dunlap, *DDT, Scientists, Citizens and Public Policy*.

49. See "Ethical Debate: Doctoring Malaria, Badly: The Global Campaign to Ban DDT," *British Medical Journal* 321 (2 December 2000): pp. 1403–05.

50. Erik Jorgensen to P. J. Ward, chief forester, Great Lakes Paper Company, December 12, 1963; P. J. Ward to J. W. B. Sisam, December 16, 1963, UTA A2004-0025/013 (03) "Shade Tree Research Laboratory, 1963–."

51. "Elm Disease War Starts Fight to Guard All Trees," *Telegram* (April 3, 1964).

52. "The Shade Tree Research Laboratory, Present Research and Program, October 1, 1963," UTA A2004-0025/013 (03) "Shade Tree Research Laboratory, 1963–." Although the laboratory declined industry funding in 1964, (see "The Shade Tree Research Laboratory, A Short Progress Report, May 1964," UTA A200-0025/013 (03) "Shade Tree Research Laboratory, 1963–.") arcan-1@mailman.srv.ualberta.ca. Records in subsequent years show funding from industry (see UTA A200-0025/013 (03) "Shade Tree Research Laboratory, 1966–"). Bidrin proved a disappointment, toxic to trees and people, and ineffective against the beetle. See "Experts Differ on Chemical's Effectiveness," *Peterborough Examiner,* November 22, 1965, clipping in UTA A200-0025/013 (03) "Shade Tree Research Laboratory, 1963–."

53. E. D. Kondo, D. N. Roy, and Erik Jorgensen, "Salts of Methyl-2-benzimidazole Carbamate (MBC) and Assessment of Their Potential in Dutch Elm Disease Control," *Canadian Journal of Forest Research* 3 no. 4 (1973): pp. 548–55. For Dutch elm disease control today, see Linda Haugen and Mark Stennes, "Fungicide Injection to Control Dutch Elm Disease: Understanding the Options," *Plant Diagnosticians Quarterly* 20 no. 2 (June 1999): pp. 29–38.

54. Draft announcement, "The Shade Tree Research Laboratory," attached to J. W. B. Sisam to Erik Jorgensen, January 4, 1966. The announcement was to be distributed in early 1967, UTA A200-0025/013 (03) "Shade Tree Research Laboratory, 1966–."

55. "The Shade Tree Research Laboratory," Information statement submitted by Erik Jorgensen, January 17, 1967 to J. W. B. Sisam, and forwarded by Sisam to The Provost, University of Toronto, January 20, 1967, p. 2, UTA A200-0025/013 (03) "Shade Tree Research Laboratory, 1967–."

56. Sisam, p. 109.

57. Sisam, p. 110.

58. Morsink, "Municipal Tree Management in Urban Areas," p. 4.

59. Erik Jorgensen, "Approaches to Shade Tree Research at the University of Toronto," Proceedings of the 43rd International Shade Tree Conference, 1967, pp. 256–66, published as "Urban Forestry: Some Problems and Proposals," Toronto: Faculty of Forestry, University of Toronto, 1967; "Urban Forestry in Canada," Proceedings of the 46th International Shade Tree Conference, 1970, Shade Tree Research Laboratory, Faculty of Forestry, University of Toronto, 1970; "Towards an Urban Forestry Concept," 1974;

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60. "Shady Friends," *The Globe and Mail,* July 24, 1969.

61. See Jorgensen, "The History of Urban Forestry in Canada," and J. W. B. Sisam to Rene Brunelle, Minister of Lands and Forests, June 5, 1968, UTA A2004-0025/013 (03) "Shade Tree Research Laboratory, 1968–." Sisam commented further: "Indeed this subject and the work of the Shade Tree Research Lab receive considerable and I believe favourable attention through one of the committees of the conference."

62. Konijnendijk, et al., "Defining Urban Forestry," pp. 93–103.

63. Bill Morsink, interview by author, October 22, 2006, Toronto, Ontario.

64. Derrick de Kerckhove, cited in Benedetti and DeHart, eds., *Forward through the Rearview Mirror,* p. 138.

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