

# Trees as Urban Infrastructure: Book Review

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*Trees in Urban Design*. Second Edition. Henry F. Arnold. Van Nostrand Reinhold, 1993. 197 pages. Hardcover. \$39.95

When the first edition of this book was published in 1980, it was called a classic—an intelligent and complete proposal for the transformation of cities through structured tree planting. Arnold, a landscape architect based in Princeton, New Jersey, views trees as an integral part of urban infrastructure rather than as a decorative palliative. He feels that tree planting structured by architectural principles of scale, massing, and perspective can transform American cities from barren, eroded landscapes to rich human environments enhanced by shade, pattern, texture, and enclosure. It was a simple proposal—large caliper specimens of a single species planted at closely spaced intervals would, if properly maintained, create a continuous canopy of branches and foliage that would unify the unrelated elements of streets and create a system of linked green spaces of the kind so admired in European cities.

Arnold's conviction of the power of geometry, his insistence on single species planting and close spacing, was seen as a powerful affront to the caretakers of city trees, the arborists, horticulturalists, and municipal tree superintendents who were exhausted after battling years of deferred maintenance and the devastation of Dutch elm disease. Classic confrontations occurred in meetings and conferences across the country, pitting landscape architects inspired by the spatial manipulation of LeNôtre against the arborists, who were newly aligned with the proponents of

biological diversity and environmental responsibility. The dispute resurrected the age-old suspicion that designers, remote from the day-to-day care of a vulnerable and disrespected tree population spun out ideas remote from reality.

Arnold held his position, criticizing municipal arborists as shortsighted, willing to sacrifice the profound aesthetic effect of designed tree planting in an overreaction to the loss of the American elm and to the inevitable maintenance demands of trees in cities. Principles of forest ecology cannot be transported to cities where plants grow under artificially controlled conditions. Through planned growth and change, cities can be biologically "fit" communities—healthy and stimulating places in which to live. Arnold emphasizes that species diversity has meaning only at a regional level. Mandating that four or five species be planted on each street, as has been done recently in New York City, does not affect a regional ecosystem and contributes to the chaos of city streets. European tree managers look with bemusement on American planting methods. Several years ago I met with Tristan Pauley, Chief of Paris Plantations. A recent inventory of Paris street trees had revealed too strong a reliance on the London plane (43% of the total tree population). Paris is now implementing a ten-year plan to diversify species. This new plan continues to emphasize single species planting on all streets and boulevards to reinforce the strong spatial order that is such a powerful characteristic of that city.

The early chapters of the second edition of *Trees in Urban Design* largely repeat those of the first, describing the value of geometry in



*Platanus occidentalis*, the American sycamore, along Memorial Drive in Cambridge, Massachusetts. Photo by A. E. Bye.

urban planting, the details of spatial composition, and the characteristics of growth and form of species recommended for urban planting. The excellent photographs and diagrams of the earlier edition have been updated with projects from the 1980s. References and the comprehensive bibliography have been expanded to reflect the broad spectrum of new ideas that Arnold draws on to expand his closely reasoned argument—from Mandelbrot's fractal geometry to Edward O. Wilson's ideas on biodiversity. In the first edition, which coincided with the beginning of the resurrection of the

reputation of Frederick Law Olmsted, Arnold, while respectful of the significant contribution of Olmsted, offered a critical analysis of the limitations of the pastoral park in the modern city. In this new edition Arnold carries these ideas further by pointing out the fallacy of appropriating emotionally charged ideas about agrarian nature or, worse, concepts of wilderness ecology for urban situations. Arnold does not want to define cities by what they are not. He has, with some fortitude, tried to define what constitutes the character of urbanity so admired in the capitals of Europe and so valued



*Carretera de Miramar, Montjuïc, Barcelona. Photo by Karen Madsen.*

in the successfully planted areas of American cities.

In this second edition Arnold clearly sets out to defend his position as a realist and a practitioner. He offers a new chapter with detailed technical instructions on how to deal with urban environmental problems. He rejects the standard "suburban" tree planting method, which assumes soil suitable for plant growth. New techniques that deal with improved soil mixtures, subsurface drainage, drip irrigation systems, and venting systems for root aeration are described and illustrated. Substantial information on ground-surface treatment from permeable pavers to the standard European detail of stabilized crushed stone are offered as alternatives to mounds of mulch. He describes the technique of planting at grade over underground structures, an increasingly popular

method of providing new green space within the density of central cities. Boston's Post Office Square, built over an underground parking garage, is an excellent example of good design and new technology.

This section also describes the pervasive shortsightedness of government agencies. These "new" techniques have been around for a number of years but have been rejected by municipalities because of their increased cost. Cities refuse to provide adequate underground conditions for trees but will replace a single specimen three or four times in as many years, claiming the demise to be a sign of the hopelessness of planting in cities. New tree planting techniques is hampered by a lack of knowledge. Only recently have biologists begun to seriously study tree roots and as a consequence we have substantially altered our view of growth

patterns and growth requirements. It is clear from recent projects documented by Arnold that trees with adequate conditions for healthy root growth can withstand the standard litany of urban stresses, sustain growth, and become low-maintenance additions to the fabric of the city.

In a final chapter titled "A Longer View," which addresses the inseparable issues of trees and governance, Arnold discusses the financial aspects of tree planting in the context of cost-benefit analysis. He compares the cost of urban planting with the benefits accrued as a result. While admitting that this is an imprecise exercise, he describes how his accounting method can help increase municipal tree budgets. The seamless integration of trees into the pattern of a city involves master planning: a tree inventory, a municipal tree policy, a tree plan, and detailed standards and regulations. This is not a new idea. Haussmann's plan for Paris included tree planting schemes still admired today. L'Enfant's plan for Washington, D.C., and turn-of-the-century plans for sections of New York City have resulted in communities of great character and livability.

The value of trees in cities has received a great deal of attention since the first edition of this book. Urban forestry, an odd term that satisfies no one but persists for lack of a better

one, has received full professional status with the strong promotional efforts of the American Forestry Association. The advantage of this high visibility is offset by the profession's insistence on applying principles of forest ecology and silviculture to city streets and by its all-too-obvious bias toward suburban settings. The fact that trees create beneficial local climate conditions has been well documented in the popular media. Yet few authors have taken on the integration of physical benefit, emotional effect, and urban design. Trees in their evolving form (Arnold's term) can contribute a unique sense of order within the dynamics of city life. A study completed in 1987 by the American Forestry Association indicated that American cities have half the number of street trees that they can accommodate. Civic design, a term with visionary appeal, could be the discipline to lead the planting effort. By setting aside conflicting agendas, professionals and community tree advocates can come together to integrate successful tree planting into the complex organization of cities.

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