a BUILDING like a TREE, a CAMPUS like a FOREST

Sustainable Design Comes to New England Higher Education

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Among all the achievements of his long and productive life, Thomas Jefferson wanted to be remembered for three things. They are inscribed on a stone obelisk over his grave at Monticello. "Here was buried Thomas Jefferson," the inscription reads, "Author of the Declaration of Independence, Of the Statute of Virginia for Religious Freedom, And Father of the University of Virginia." This from a man whose distinguished career included eight years as president of the United States. For Jefferson, his activities were not as important as the things that he designed, which suggests a mind keenly attuned to the ways in which the thoughtful and poetic ordering of things could create a vital legacy.

While we daily experience the legacies of the Declaration of Independence and the Statute of Virginia for Religious Freedom, which matured into the Bill of Rights, one can see the physical embodiment of Jeffersonian design on the campus of the University of Virginia. Moved by the belief that public education is the keystone of a democratic republic, Jefferson secured land for the university, developed its curriculum, pursued distinguished professors, stocked the library and perhaps most importantly, designed the campus.

Students at Oberlin's Lewis Center for Environmental Studies are greeted by a soaring atrium, which allows ample daylight to enter the building. Photo copyright © by Barney Taxel, 2002.

His "little academical village" was laid out around a central, tree-lined lawn. Students and professors lived in sturdy brick residences linked by open arcades to the stately presence of the central Rotunda, which housed the library and classrooms. At the other end of the lawn, one could gaze out on the nearby peaks of the Blue Ridge Mountains. The campus was, and is, a beautiful place—by design. Jefferson's collegial village was intended to be an inspiring setting for the dynamic activity of a community, a place where students and faculty could mingle, gather, learn and create a vibrant academic institution. It remains a living monument to that ideal, and we see in the quads of universities from New England to the Pacific that it is a much-copied icon of American campus architecture.

What legacy is today's campus architecture leaving for the future? As in other regions, development on many New England campuses over the past 30 years has tended to be more random than planned. Following the same patterns of sprawl that have defined most development in our era, the placement of new campus buildings often separated them from the life of the university, while a hodgepodge of architectural styles clashed with the vocabulary of the historic quad. Lost, or at least diminished, is a fundamental asset of academic life in New England: the experience of community on a campus uniquely and beautifully attuned to its surroundings. In recent years, an evolving understanding of the environmental impacts of new buildings has further separated campus architecture from a legacy universities can wholeheartedly embrace.

The University of Rhode Island, for one, is trying to change that. There, planning is underway for a cluster of new buildings many hope will mend the fracture between forward-thinking new development and the historic campus. Though pencils have not yet been put to paper, planners foresee the new buildings as the foundation of a sustainable academic community, a model of "green design" that will project the values of environ-

mental responsibility while enhancing the traditional assets of New England campus life. This melding of sustainability with strategic planning is not only the shape of things to come in campus architecture but the signal of a deeper cultural shift that may well change our understanding of literacy.

What is sustainability?

Sustainability is a descriptive term for a range of cultural responses to the environmental impacts of economic growth. It is often defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Described in this way, sustainability is just a minimum precondition of survival—not very inspiring. More richly defined, it is an intelligent, creative and hopeful stance towards the future. In Jeffersonian terms, we might say sustainability is an appreciation for the legacy of one's designs—an interest in the long-term health of nature and human culture.

Sustainable design puts that sensibility into practice. Conventional approaches to sustainable design focus primarily on outlining strategies for architectural systems that make efficient use of energy and materials. Sustainable land planning and site design strategies emphasize an environmentally responsive use of vegetation, water and other natural systems. While these strategies represent a marked improvement over land development patterns of the past decades, they tend to rely on minimizing the human impact on the environment, striving only to be "less bad."

And being less bad, or in this case, being more efficient, is not necessarily good. This is especially true when it comes to selecting architectural materials. Most building materials are not designed with human health in mind. Many commonly contain toxic substances such as formaldehyde and volatile organic compounds, which off-gas into building interiors. In energy-efficient buildings, which tend to be tightly sealed to reduce heating and cooling costs, toxic chemicals accumulate in concentrations that make indoor air quality on average three times worse than the most noxious urban air. In buildings such as these, one can only hope for a draft of cool New England air.

We do not see sustainable design as being about efficiency. Instead, we encourage an affirmative design agenda, one that allows the human impact on the environment to be positive, vital and good. This new conception of sustainable design finds its roots in the desire to discover fit and fitting spaces for human habitation—the desire to become native to one's place. For us, natural communities and ecosystems serve as models of interdependence, with each member relying on and contributing to the well-being of the whole. Informing good design, this vision affirms the possibility of developing healthy and creatively interactive relationships between the natural environment and human settlements.

The design process begins with an assessment of the natural systems of a place—its landforms, hydrology, vegetation and climate. Combining an understanding of building and energy systems with the site's natural flows of sun, wind, water and vegetation, designers discover an "essay of clues" that suggests appropriate patterns for development of the landscape. Building materials are selected with the same care; they are chosen only after careful assessments of a variety of characteristics, ranging from their design chemistry to the environmental impacts of their use, harvesting or manufacture. With this emphasis on sustaining and enhancing the qualities of the local landscape, the resulting architectural and community designs meet exceptional levels of performance and create beautiful, healthy environments for human and natural communities.

Plants are instrumental in the "living machine" water-treatment process at the Lewis Center. Photo copyright © by Barney Taxel, 2002.

Life-support system

We like to think that every landscape can be fecund, every building a life-support system. The Adam Joseph Lewis Center for Environmental Studies at Oberlin College is such a building. Designed to reverse environmental stresses and restore the local landscape, the building is like a tree: Enmeshed in local energy flows, it accrues solar income, filters water—absorbing it quickly and releasing it slowly—and creates habitat for living things.

With 3,700 square feet of photovoltaic panels, the Lewis Center will one day be a net energy exporter. Its other sustainable design features include geothermal wells for heating and cooling, daylighting and fresh air delivery throughout, an extended botanical garden that recovers nutrients from circulating water on-site, and a landscape that offers social gathering spaces, instructional gardens and orchards and a newly planted forest

Made of Recycled Classrooms

When Middlebury College began replacing its old science center with a spanking new college library this spring, builders planned to recycle 98 percent of the old six-story building that even college officials had referred to as an "architectural mistake."

The old Middlebury Science Center.

An onsite "crusher" is grinding the 35-year-old science center's 600 tons of concrete into project fill to be used for the new library construction and on roads. Limestone exterior walls will be salvaged for reuse, and copper, steel, aluminum, glass and wood will be recycled. Much of the center's old science equipment has already been donated to schools in Vermont and New Hampshire.

Middlebury in 2000 became the first U.S. college to adopt specific environmental policies on construction and demolition waste. College officials say the estimated $800,000 cost of recycling the science center is comparable to the cost of demolishing the building and shipping the waste to a landfill.

The $40 million, 135,000-square-foot library is expected to open in the fall of 2004. – *J.O.H.*

grove, which has begun the long process of re-establishing the habitat of the building's northern Ohio location.

The building and its surroundings have become the center of a learning community. The comfortable sunlit classrooms and public gathering areas encourage mingling, communication and reflection. Inside and out, the building offers students and teachers opportunities for learning about the natural world. In fact, encouraging fluency in the language of natural systems—what Oberlin Professor of Environmental Studies and Politics David Orr calls "ecological literacy"—was the guiding intention of the building's design. As Orr has written, architecture always serves a pedagogical function; the design of buildings teaches us how we use resources, how we relate to nature and what our culture values. It is absurd, he believes, to teach young people about the world in buildings that have no relation to their surroundings and express ignorance of how nature works. Instead, the Lewis Center teaches ecological literacy—the cultural currency of this new century, and the next.

This is an entirely new, restorative legacy—one that is within the grasp of any campus building or landscape in New England, old or new. On the campus of the Woods Hole Oceanographic Institution, for example, we are renovating a 17-room, 120 year-old Victorian summer home, transforming it into a model of sustainable design while preserving its historic character. And at URI, the university community will be determining the shape and feel of new buildings, imagining what fits in the landscape of coastal Rhode Island.

Seeking a sustainable campus, they will probably be looking at the region's natural energy flows, its soil and vegetation and climate. New England's rich tradition of vernacular architecture might be evoked, or the building could be a contemporary design that suggests the university's future relationship to human culture and nature in the region.

Though similar design principles will be applied, the URI sustainable community will not be a carbon copy of Oberlin's. Sustainable design is not an ideology that imposes foregone conclusions on a setting. But as planning proceeds, students and professors at URI just may decide they too want a building like a tree—and a campus like a New England forest.

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