

In the United States and many parts of the world, people with enough money can build whatever they choose. Zoning laws and various land-use restrictions are more often than not simply paper barriers, permeable by those with enough cash to buy connections. So deals are cut, and casinos spring up in places like mangrove wetlands along the Mississippi coast [--]gambling with nature, which owns the house, so to speak.

Highways crash through prime woodlands. Suburban housing tracts with bucolic names sprawl over rich farmland from sea to shining sea. The Front Range of the Rockies is becoming one long string of weary housing tracts stitched together by pavement and strip development. Close up we call this progress, but from a sufficient perspective it is a terrible blight spreading across the face of the planet.

What we build reflects the larger appetites of consumers who have forgotten how to be citizens. The average house has nearly doubled in size in the last half century. Trophy palaces in places like Aspen, Colorado are measured in tens of thousands of square feet. In Midwestern fields, starter mansions grow instead of corn.

What will all of this building frenzy look like to those living a century hence? What have we set in motion? Writer and ecologist Wendell Berry once noted that we do not know what we have done because we do not know what we have undone. So, how much has been undone to build the American way of life, and how much more will be undone in the attempt to maintain it all?

Americans, not famous for restraint or subtlety, set the standards for the last half of the 20th century. We emerged as the preeminent nation after World War II with enough ecological slack[--]or access to it[--]to fuel another boom, and we did as opportunity and our expansionist disposition beckoned. To a world recovering from war and needing development, our example of hyper-materialism organized around the automobile set the standard.

Yet no one should be permitted to build anything larger than a woodshed without first visited some ancient ruin[--]the Roman Forum would do[--]and written one term paper on the ephemerality of all human endeavors using only the book of Ecclesiastes as a reference. The experience, properly digested, might cure much of the grandiosity that afflicts our skylines and the emptiness of our souls. The second assignment would be to visit some place[--]say Devon, England[--]where the human presence and the landscape have been braided together with great intelligence at a human scale over several millennia. That term paper should cite only Jacquetta Hawkes's classic *A Land* [--]arguably a cure for the

disease afflicting the minds of those building strip malls, industrial "parks," and suburban "developments." A third assignment would be to observe an Amish barn raising to see how a community supports its own using local resources to build useful things[--]no term paper required.

The numbers are sobering. It is estimated that the construction, maintenance, and operation of buildings in the United States consumes close to 40 percent of the country's raw materials and energy and is responsible for about 33 percent of our CO2 emissions, 25 percent of our wood use, and 16 percent of our water use. In 1990, 70 percent of the 2.5 million metric tons of non-fuel materials that moved through the economy were used in construction.

Further, by one estimate we will attempt to build more buildings in the next 50 years than humans did in the past 5,000. Most of this development will be driven by individuals operating in a market system that does not account for losses of farmland, forests, wetlands, or biological diversity[--]or for the human need for community. In other words, we will often solve immediate problems of space and ego at the expense of spirit, coherence, and longevity. Much of it will be done on the assumption that fossil energy will be cheap and abundant forever, even as the end of the fossil-fuel era looms dead ahead. Much of it, too, will be done in the fervent belief that affluence and comfort will cure what ails us. That belief is destined, in large part, to disappoint.

Buildings mean different things at different times. To the instigator, a structure is aimed to solve one problem or another, including that of social status. To those that follow, however, buildings have a different purpose. Time, water, sunlight, insects, freezing and thawing, and wear and tear do their work. Paint peels, wood rots, metal rusts, stones shift, grass grows between cracks, surfaces abrade, and people become inattentive. In time, things come undone, and few buildings age gracefully. Those that do, do so because they receive special attention and maintenance effort; the rest are destined to become ruins. Property values decline, crime becomes more common, and investors look elsewhere[--]a syndrome common to American inner cities. What were once trophy mansions for the robber barons along Euclid Avenue in Cleveland are now faded and derelict properties with only a hint of their former glory[--]places subject to "urban renewal." And the cycle begins again: Prospect to problem to ruin, and sometimes to rebirth.

I once asked a class whether there is such a thing as "soul" in buildings. The students seized on the question avidly, but failed to identify the quality of soul. Perhaps that is a mark of youth and the number-saturated mentality of our time, yet more likely it reflects the elusive qualities of great

buildings that cannot be captured easily by words. If some buildings do have the quality of soul, whatever that means, it surely differs greatly from one building to another. To some, the Parthenon has soul, or maybe it offers grandeur hitched to a lot of history. But in the right light and the right circumstances, you can feel the presence of the past in that place as if time were an illusion.

The purposes for which buildings are built and the structures themselves, however, are temporary marriages at best. Most buildings begin their useful life serving one purpose and over time serve many others. If successful, the ultimate distinction for a building is probably to become a tourist attraction or sacred site thereafter maintained at public expense.

In short, whatever we intend for our buildings, they take on their own purposes. Winston Churchill had it right: "We shape our buildings, and afterwards our buildings shape us." Buildings influence our moods and psychology, our conversations and silences, our sense of place and history. They isolate or join and connect or disconnect us to time and history, seasons and nature. They celebrate the natural world of sunlight, wood, stone, and water, or they desecrate. By their ongoing requirements for energy and materials, they can create wider circles of damage. As clusters, towns, cities, and finally, metropolitan regions, buildings affect our sociability, energy use, affinity for nature, and larger prospects in ways we seldom stop to consider. With better design and more care, could they lead to regeneration?

The high school that I attended in Pennsylvania had the rough shape of a T, with its intersection of two long corridors. Everything about the building, the curriculum taught in it, and the people worked at right angles. It was square, solid, forthright, and no-nonsense[---]as were my teachers. The geometry of the place reflected commonly held values and probably affected students' perceptions as well. The United States was the center of things, with heaven somewhere above, hell below; men were in charge, and women were subordinate; children were to be seen and not heard. It was not an unpleasant school, as schools go, nor were the people mean-spirited. To the contrary, they were giving and caring. But the place taught more, and less, than anyone intended. I do not believe that architecture causes things in any straight-line way, yet it certainly influences what we pay attention to and what we can pay attention to.

The power of architecture and what is called "the built environment" is that few see it for what it is: a form of education. Mostly in ways that we fail to notice, the buildings, freeways, shopping malls, and sprawling suburbs of our society are a powerful and pervasive kind of instruction.

Much of contemporary design's message is that of human dominance, speed, power, individualism, the importance of the new over the old, and above all the centrality of consumption. The unavoidable lesson is that we need take no thought for the morrow; Devil-take-the-hindmost, not "in God we trust." Toss in television and the Internet, and the possibility for anything like real education drawing forth is considerably diminished. Even so, what's drawn forth often reflects only what's been implanted by thousands of hours of commercials, staged violence, and the deep silliness of commercial society. We are becoming people of surfaces instructed by the places we've made.

We are also becoming people accustomed to ugliness. Biochemist Rene Dubos once said that the worst thing we could do to our children would be to convince them that ugliness is normal. Much of what we've built in the post-World War II boom has been award-winning ugly, or has caused ugliness somewhere else or at some later time. A full recounting of our sins in that regard could take on the flavor of a hellfire and brimstone sermon. But the only useful questions have to do with how and how long it will take to transform ugliness into something lovely and to improve our skill in dwelling.

I regard it as axiomatic that we are predisposed to what biologist Edward O. Wilson calls "biophilia," or "the innate affinity for life and lifelike processes." By the same logic, most people most of the time have strong feelings about beauty, order, and harmony, and at some level are wounded by their absence. A sense of beauty is not, in other words, simply in the eye of the beholder; it comes with our hard wiring. Most people have significantly different responses to a traffic jam and a walk along a forest path, loud street noises and whip-poor-wills of a quiet evening, a junk-strewn commercial strip and unpaved rural lane.

Those are not just matters of opinion, unless one counts the opinions of our tissues and genes[---]a democracy of the whole organism. On the surface, there are wide disparities about what's beautiful and what's not, but there is a deeper level of consensus. We heal faster in the presence of natural beauty. We have an affinity for trees, water, animals, broad vistas, sky, and mountains. We have an inborn sense of harmony that is part of our evolutionary equipment. After millions of years, it would be surprising if it were otherwise.

The architectural expression of this evolutionary tug is all around us: gardens, landscaping, mown grass, white-painted tires in front of modest homes in the hills. Most of us lavish affection, if not skill and ecological competence, on the real estate under our direct control. Moreover, few of us

vacation in places associated with urban violence and decay, like Newark or South Central Los Angeles, and few people live in such places solely by choice.

The expression of beauty changes in different places and times, and, although the possibilities for creating it are not equal, our built-in sense of beauty and place is expressed in many different ways. That sense of place, however, breaks down as the scale increases. And driven by population growth, industrialization, and mechanization, the scale of human civilization has increased with astonishing speed in the past two centuries. Villages became cities; cities became metropolitan areas and then formless, sprawling, megalopolitan regions.

The word "sprawl" doesn't quite describe what is more like an eruption of humankind fueled by easy access to ancient sunlight, and the drawdown of the ecological capital of soils, forests, and biological diversity[---]that is, ecological disease. Sprawl brings a range of human health problems. Suburbanites living in isolation from each other and dependent on the car for transportation are more obese, suffer more often from heart disease, are more prone to asthma, and are victims of other diseases that are rare in more-concentrated communities.

Our collective behavior is comparable, as someone once put it, to yeast cells in a wine vat, destined to grow until overcome by our own waste products. The result is equivalent to a binge[---]yeast cells feeding on sugars; humans feeding on fossil fuels. If there is a better analogy, I have not heard it. The difference is that, unlike yeast cells, we supposedly have both the possibility of foreknowledge that the "morning after" looms ahead and, presumably, the intelligence to do something smarter instead.

The important questions for us have to do with the nature of the transition to a society that can be sustained and, hopefully, will be spiritually sustaining as well. That transition will change much that we now take for granted, all having to do with our ingrained belief in the efficacy of brute force over nature. We live in the age of paradox. Our buildings are taller, but our purposes are shorter. We have more labor-saving devices, but less time for neighbors and friends. We have more money, but less fairness; more weapons, but less security; more power over nature, but a less-stable nature than ever before. We have more science, research, and intellectual capability than ever, but less common sense and good judgment in our public affairs. The old Enlightenment belief that with enough rationality and science we could make cause and effect transparent, has come undone in a tsunami of complexity and unintended consequences. It is not too much to say that we

are midway through the hinge point of human history[--]a time in which we make a midcourse correction or risk losing it all.

The problem is not that we, Homo sapiens, have failed but that we've succeeded too well. We have conquered, dominated, surmounted, advanced, progressed, multiplied, and grown prosperous, and now, paradox of paradoxes, at the pinnacle of our success we can see the end of it all[--]with a whimper or a bang, or perhaps some of both.

There is now a global debate about how we might make things "sustainable," but no one knows what that will require of us. We will need instructive models of sustainability, small enough to get our minds around, but big enough to give us leverage at a larger scale. And higher education must play its part.

For example, research and education in the petrochemical era were based on the faith that we had solved the energy problem once and for all, or would soon do so. The years ahead will require a different agenda directed to meeting the basic challenges of shelter, food, health care, community design, security, environmental quality, and economic renewal without benefit of cheap fossil energy. Colleges and universities have an opportunity to lead in that transition, beginning with the design and construction of academic buildings. By doing so, the campus will become the focus of study, along with the related techniques of analysis, ecological competence, and technological skill adapted to a specific place.

Each building is a unique ecosystem within the larger ecosystems of landscape and region with particular soils, landforms, hydrology, and energy flows. Buildings take in energy, materials, and water, and release heat, waste, and pollution. In a fossil-fuel-powered world every effort has been made to make such things invisible, hiding furnaces and hot water heaters in basements, and wires and pipes behind walls. Similarly, the infrastructure that connected buildings to power plants, sewage treatment facilities, wells, mines, and forests has been mostly out of sight, and hence out of mind. Most of us in the fossil-fueled age are thus unaware of the underlying political and ecological realities of our lives.

Ecologically designed buildings and institutions afford a chance to make such relationships explicit, thereby becoming part of the educational process and research agenda organized around the study of local resource flows, energy use, and environmental opportunities.

Further, the fundamental issue is not just about materials, energy, landscapes, and buildings but about the kind of people we intend to become. The ambitions of the current generation of college students are said to be predominantly toward making money. University of California at Los

Angeles researcher Linda Sax has tracked the value orientations of students since 1967, and the trends are not entirely encouraging. A large majority aim now to be well-off financially while fewer aspire to develop a "meaningful philosophy of life." Such evidence, I suspect, says much more about us than it does about our students, and what it says is that we, as educators have generally failed to put the opportunities and challenges of an improved human future before them in a realistic and compelling way. The total impact of television, advertising, and education gives them too little reason to enlarge their view of their future and their role in making a larger human vision.

But there are better possibilities for those perceptive and alert enough to see them[--]and thus to become the pioneers of a new age in which humanity has sobered down to live and prosper within the means of sunlight, soils, and ecology. And, again, colleges have a role in envisioning and transmitting those possibilities.

The decades and century immediately ahead will require a remaking of the human presence on Earth that stabilizes the climate; preserves soils, forests, habitats, and other species; reduces the human population; builds habitable cities; improves our collective ability to make wise decisions; and does all of this while creating greater equity within and between generations. The journey ahead will be gut-wrenching or an adventure. The choice is ours, but if we intend to stay awhile, we can have no other agenda.

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