

Sense and sustainability, through history.

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It may be surprising to discover, at the end of the twentieth century, that today's green architecture advocates look for inspiration to sustainable design models created thousands of years ago. For centuries, the Greeks, Romans, Chinese, Native Americans, and most other civilizations located and built their homes and communal buildings with wind, water, and sun in mind.

As part of his Ten Books on Architecture, the great Roman architect Vitruvius dedicated many pages to the proper orientation of houses, buildings, and cities with regard to sun, wind, and climate. He noted, "There will be a natural propriety in using an eastern light for bedrooms and libraries, a western light in winter for baths and winter apartments, and a northern light for picture galleries and other places in which a steady light is needed; for that quarter of the sky grows neither light nor dark with the course of the sun, but remains steady and unshifting all day long."

In the Roman Empire, "solar access rights" were written into law when fuel wood shortages put a premium on solar heating, and well-placed windows were a status symbol. In ancient China, shamans were enlisted to find the most naturally auspicious spots for homes (and graves). In a Socratic dialogue by the Greek writer Xenophon, in about 400 B.C., the character Isomachus brings his bride back to his solar-oriented home and shows off "living rooms for the family that are cool in summer and warm in winter."

Today, as we approach 2000 A.D., our own civilization has, of course, found its own answer to the ideal of "warm in the winter" and "cool in the summer"--central heating and air conditioning. Modern architecture contains marvels of ingenuity and engineering, but twentieth-century building technologies, materials, and heating and cooling systems are predicated on cheap, ready supplies of fossil fuels, cheap transportation systems, and few limits on natural resources.

Somehow, over the centuries, we unlearned the lessons of the ancients in designing with natural forces and earthly considerations in mind. In fact, most of contemporary architecture fights with nature, climate, and the elements. An inordinate amount of energy is used to heat and cool poorly designed buildings. Today, roughly one-third of all energy consumed in the United States is used to power commercial and residential buildings.

Americans descended from one of the few groups of colonists who never adopted native architecture, making our buildings particularly insensitive to local climate and other conditions. Even the few simple "long houses" of Native Americans were more effective defenses against the harsh New England winters than were the transplanted European-style houses that the early colonists built.

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This die-hard defiance of nature, part of the muchadmired frontier spirit, has backfired. As S. David Freeman writes in *Energy: The New Era*, "Americans expect --indeed, they insist upon-- sufficient energy to maintain the temperature they desire in every inch of indoor living and working space no matter how hot or cold it may be outdoors. The typical American building is now too hot in the winter and too cold in the summer."

The modern skyscraper exemplifies unnatural architecture. A sheer block of glass and steel, it traps so much heat that prodigious amounts of energy are needed to air condition its interior-- often, even in winter. According to one estimate, the World Trade Center in New York City consumes more energy than the entire city of Rochester, New York.

Today the average American suburban house may guzzle as much energy as an entire rural town of a century ago. While it is difficult to quantify the consumption of the typical colonial or nineteenth century American farmer, it is clear that their homes had fewer and smaller windows than houses built today to minimize heat loss, although they were built with southern exposures to maximize solar gain.

Christopher Evers, writing in *The Old House Doctor*, notes that American houses built before World War II were carefully sited and constructed. "They were rarely built in exposed locations (no matter how magnificent the view) and were often protected by the thoughtful placement of their barns and other outbuildings between them and the prevailing weather."

As Evers further points out, most old houses had deciduous trees planted to the south so "summer foliage would filter out the strong sun of that season, while their bare branches wouldn't impede the treasured solar radiation in winter. Evergreen windbreaks were also commonly located to the north and west of a house, where they very effectively weakened the force of wintry winds."

During the last decade, Americans have become more aware of the energy wastefulness of their homes and workplaces. According to the New York State Energy Office, even the World Trade Center has been subjected to an energy retrofit. But homes and buildings have a long way to go.

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