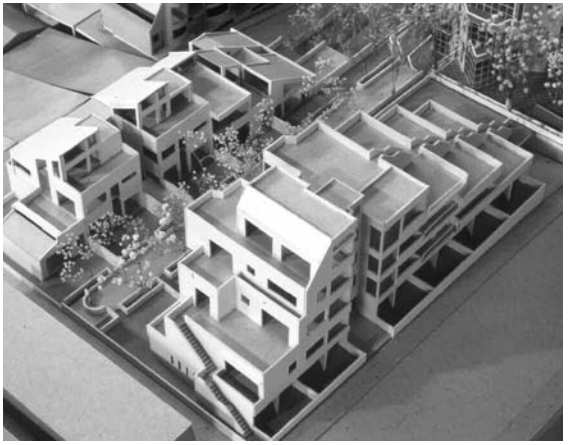
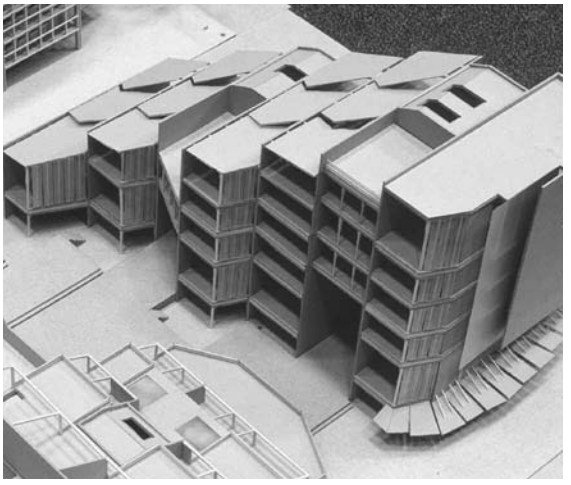
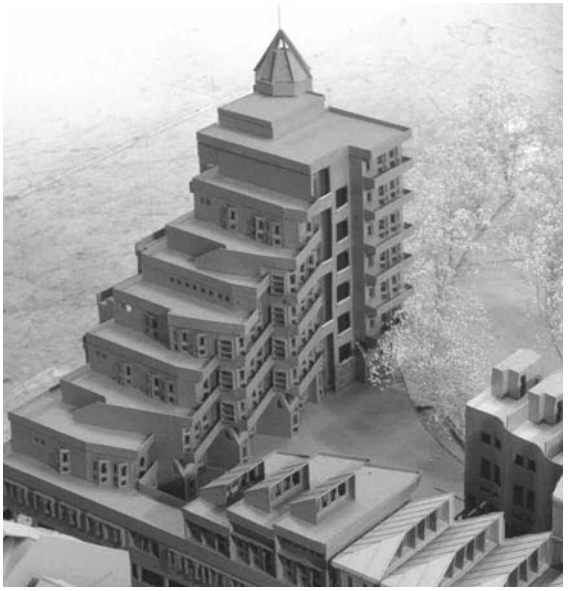






Terraced Buildings: Designed under solar envelopes by architecture students.

alveoli (tiny air sacs) and the capillaries that carry the blood. When we breathe in, the alveoli expand with air, and the interstitium stretches into a very thin layer. In this way, alveoli and capillaries are brought into close proximity so the oxygen has less distance to travel in its diffusion from outer world (alveolus) to inner world (capillary). When we breathe out, the process reverses and the interstitium contracts. Like Catalano's flower, architecture can also expand and contract in response to the cycles of nature.

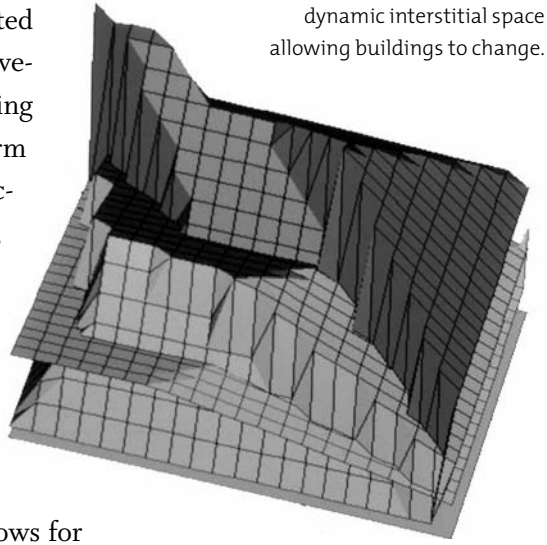
We have seen that the basic solar envelope, generally derived from winter sun angles, tends to produce roof terraces, a real benefit for urban living. When the right angles of most building construction meet the sloping geometry of the solar envelope, stepped roofs are a natural result. Instead of abandoning these terraces as

left-out roofs, they can be designed spaces for enriching urban life. They can also replace the ground level covered by the building: "green roofs" for gardening, growing fruits, vegetables and flowers, and small trees—absorbing carbon dioxide and releasing oxygen into the atmosphere, attracting birds, bees, and butterflies. But municipalities that limit the building envelope by applying only winter sun angles preclude some important dynamic possibilities for design.

An architectural interstitium, by rising above the basic envelope, expands possibilities for responding to changing seasons. A building might, for many good reasons, transform from a tighter, compact winter mode to a looser arrangement in summer. Flexible structures, comprising either the whole or some part of a building, might expand and contract, making use of different seasonal envelopes. And all surrounding properties can enjoy these same design choices as well.

The functional needs of buildings quite often change with the seasons.[2] This sort of cyclic behavior may include advertising, selling, entertaining, manufacturing, sports, and gardening. Some changes can be accommodated within the fixed boundaries of the basic envelope. Others, as for example temporary housing for summer tourists or a theater under the warm nighttime sky, can benefit from a flexible structure. Summer cafés, market fairs, art exhibits, and expanded common rooms for apartment dwellers are other possible uses.

The interstitium provides the space for adding open trellises, lattice structures for supporting deciduous plants and vines that shed their leaves in winter, gaining them back in spring for summer shade. It even allows for



Interstitium on Diagonally Oriented Site: Each of three overlapping seasonal envelopes (winter solstice, equinox, and summer solstice) provides the same 6 hours of solar access to surrounding properties. Between the low winter and high summer envelopes is a dynamic interstitial space allowing buildings to change.