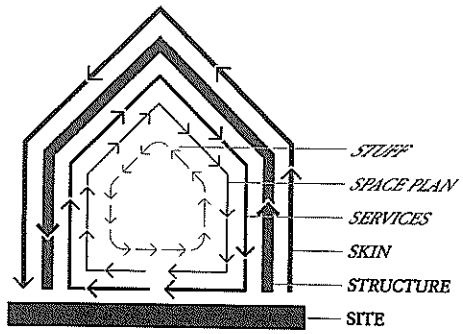
HOW BUILDINGS LEARN

What Happens After They're Built

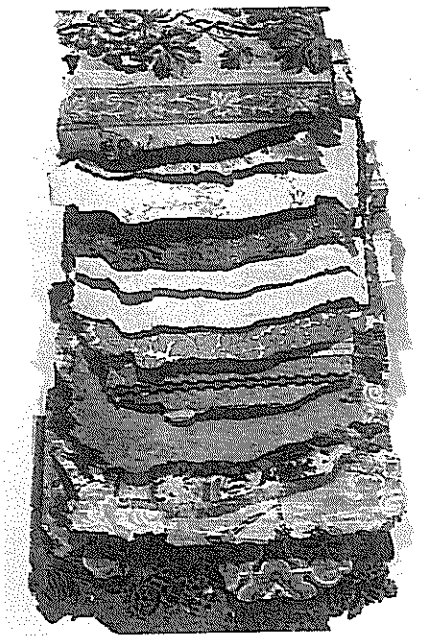


Stewart Brand

VIKING

CHAPTER 2

Shearing Layers



Cooper-Hewitt Museum, National Museum of Design, Smithsonian Institution/Art Resource, New York. Neg. no. 1960-211-1 A to M.

INTERIORS ARE FLIGHTY, fickle, and inconstant—whether from caprice, or wear and tear, or the irregular shifts of necessity.

Boredom plus money plus fashion equals new wallpaper every seven years. So it was in the Nathan Beers house of Fairfield, Connecticut. Thirteen consecutive layers of wallpaper were pasted over one another between the 1820s and 1910. This display is at the Cooper-Hewitt Museum in New York City.

HERE'S A PUZZLE. On most American magazine racks you'll find a slick monthly called *Architectural Digest.* Inside are furniture and decor ads and articles with titles like "Unstudied Spaces in Malibu" and "Paris, New York (20th-Century French Pieces Transform an East Side Apartment)." Almost no architecture. The magazine's subtitle reads: "The International Magazine of Fine Interior Design."

Architects and interior designers revile and battle each other. Interior design as a profession is not even taught in architecture departments. At the enormous University of California, Berkeley, with its prestigious Environmental Design departments and programs, architecture students can find no course on interior design anywhere. They could take a bus several miles to the California College of Arts and Crafts, which does teach interior design, but no one takes that bus.

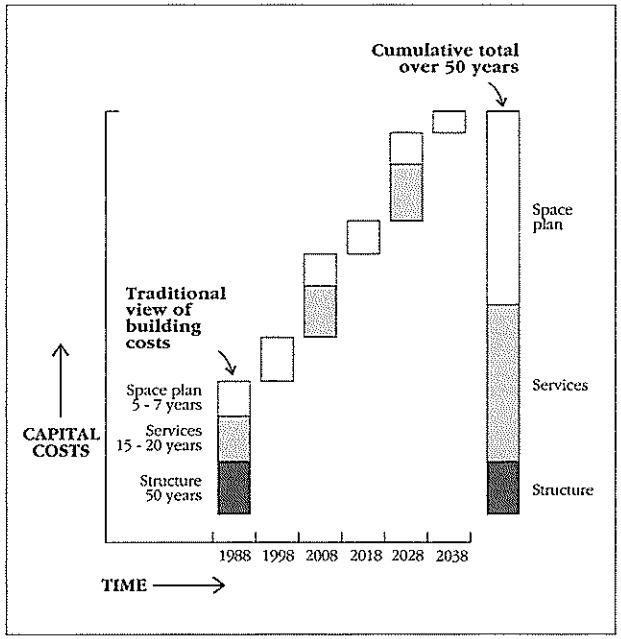
How did *Architectural Digest* manage to jump the chasm? Advertisers, the market, and a profound peculiarity of buildings did it. Originally, back in 1920, it *was* an architecture magazine, though for a public rather than a strictly professional audience. Gradually the magazine noticed that its affluent readers rebuilt interiors much more often than they built houses. After 1960, the advertisers, followed dutifully by the editors, migrated away from exterior vision toward interior revision—toward decorous remodeling—where the action and the money were. The peculiarity of buildings that turned *Architectural Digest* into a contradiction of itself is that different parts of buildings change at different rates.

The leading theorist—practically the only theorist—of change rate in buildings is Frank Duffy, cofounder of a British design firm called DEGW (he's the "D"), and president of the Royal Institute of British Architects for 1993 to 1995. "Our basic argument is that there isn't such a thing as a building," says Duffy. "A building properly conceived is several layers of longevity of built components." He distinguishes four layers, which he calls Shell, Services, Scenery, and Set. Shell is the structure, which lasts the lifetime of the building (fifty years in Britain, closer to thirty-five in North America). Services are the cabling, plumbing, air conditioning, and elevators ("lifts"), which have to be replaced every fifteen years or so. Scenery is the layout of partitions, dropped ceilings, etc., which changes every five to seven years. Set is the shifting of furniture by the occupants, often a matter of months or weeks.

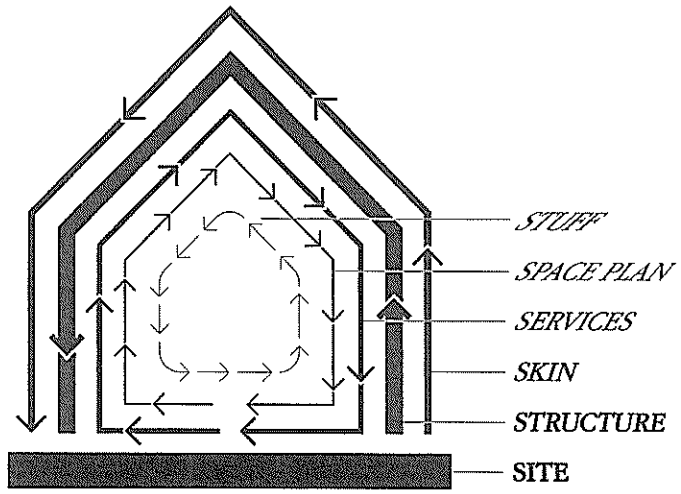
Like the advertisers of *Architectural Digest,* Duffy and his architectural partners steered their firm toward the action and the

[1] Francis Duffy, "Measuring Building Performance," *Facilities* (May 1990), p. 17.

Over fifty years, the changes within a building cost three times more than the original building. Frank Duffy explains this diagram: "Add up what happens when capital is invested over a fifty-year period: the Structure expenditure is overwhelmed by the cumulative financial consequences of three generations of Services and ten generations of Space plan changes. That's the map of money in the life of a building. It proves that architecture is actually of very little significance—it's nugatory."[1] (I have translated Duffy's terms into my terms.)



DEGW. From Francis Duffy and Alex Henney, *The Changing City* (London: Bullstrode, 1989), p. 61.



Donald Ryan

SHEARING LAYERS OF CHANGE. Because of the different rates of change of its components, a building is always tearing itself apart.

money. DEGW helps rethink and reshape work environments for corporate offices, these days with a global clientele. "We try to have long-term relationships with clients," Duffy says. "The unit of analysis for us isn't the building, it's the use of the building through time. Time is the essence of the real design problem."

I've taken the liberty of expanding Duffy's "four S's"—which are oriented toward interior work in commercial buildings—into a slightly revised, general-purpose "six S's":

- SITE - This is the geographical setting, the urban location, and the legally defined lot, whose boundaries and context outlast generations of ephemeral buildings. "Site is eternal," Duffy agrees.

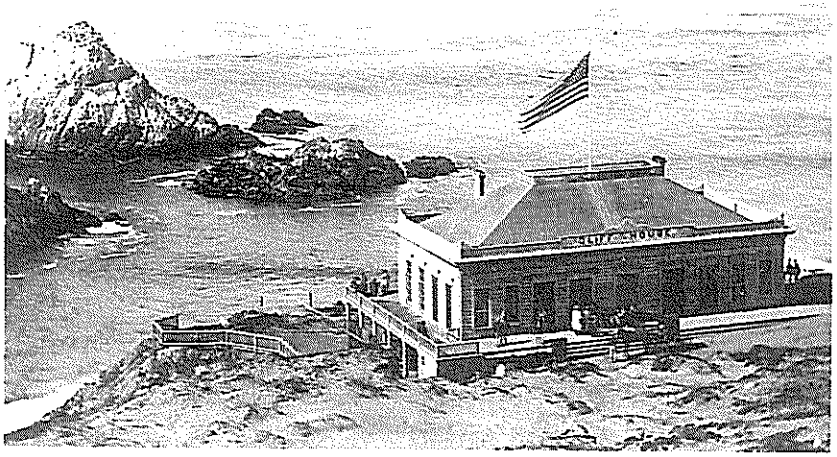
- STRUCTURE - The foundation and load-bearing elements are perilous and expensive to change, so people don't. These *are* the building. Structural life ranges from 30 to 300 years (but few buildings make it past 60, for other reasons).

- SKIN - Exterior surfaces now change every 20 years or so, to keep up with fashion or technology, or for wholesale repair. Recent focus on energy costs has led to re-engineered Skins that are air-tight and better-insulated.

- SERVICES - These are the working guts of a building: communications wiring, electrical wiring, plumbing, sprinkler system, HVAC (heating, ventilating, and air conditioning), and moving parts like elevators and escalators. They wear out or obsolesce every 7 to 15 years. Many buildings are demolished early if their outdated systems are too deeply embedded to replace easily.

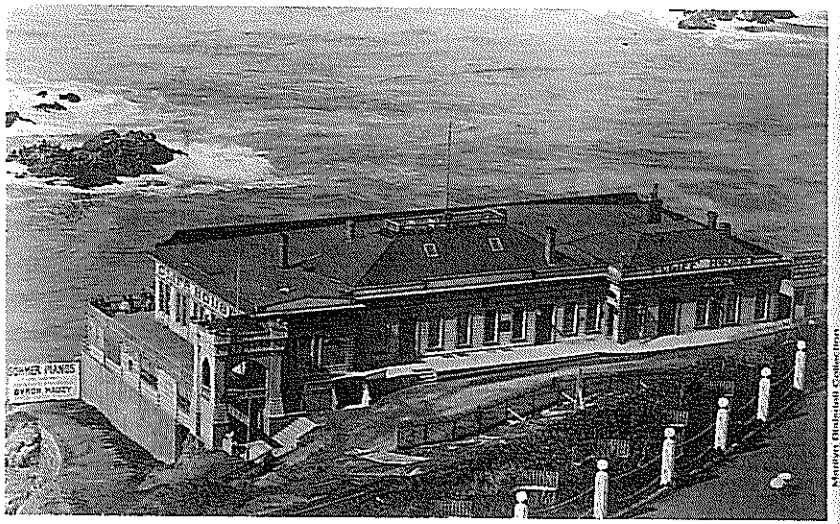
- SPACE PLAN - The interior layout—where walls, ceilings, floors, and doors go. Turbulent commercial space can change every 3 years or so; exceptionally quiet homes might wait 30 years.

- STUFF - Chairs, desks, phones, pictures; kitchen appliances, lamps, hair brushes; all the things that twitch around daily to monthly. Furniture is called *mobilia* in Italian for good reason.



Carleton Emmons Watkins, Marilyn Blaisdell Collection.

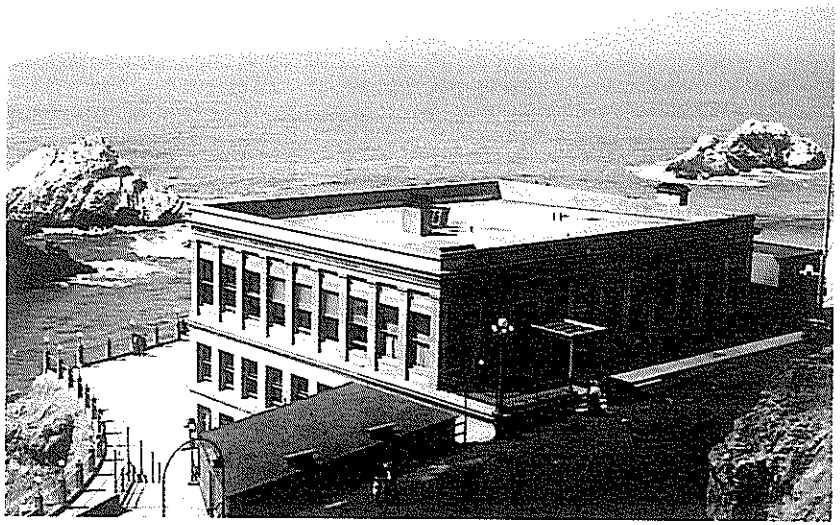
1863 - The first Cliff House was built in 1863 to take commercial advantage of the site's spectacular view of Seal Rocks (which crawled with sea lions) and Pacific sunsets. The restaurant's commercial success was always tenuous, because its customers in San Francisco were seven sandy miles away to the east.



Marilyn Blaisdell Collection.

1878 - In 1868 the original owner tripled the Cliff House in size with two asymmetric wings and a long roofed balcony. It was by now a successful gambling casino. San Francisco silver-mining millionaire Adolph Sutro, having built a home and public garden on the heights overlooking the Cliff House, didn't like its rowdy reputation, so he bought the place and converted it to a family restaurant. On Christmas night in 1894 a kitchen fire burned the building down.

(NATURAL) SITE IS ETERNAL. At San Francisco's famous Cliff House, the house



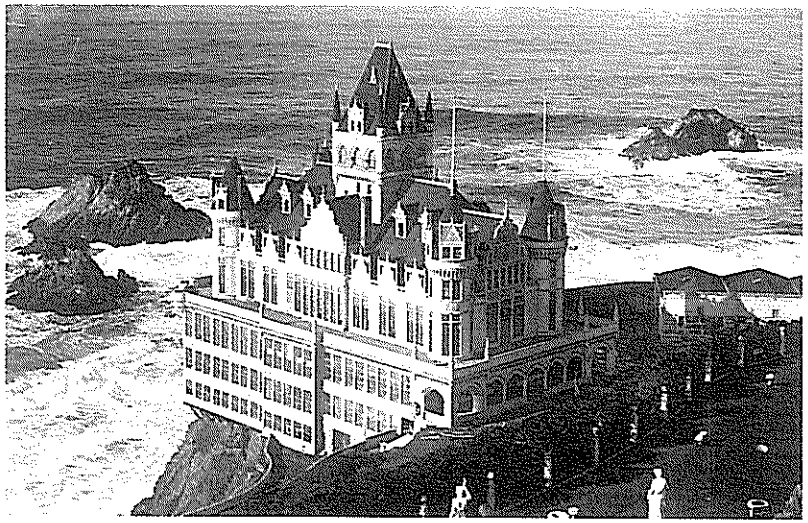
California Historical Society, San Francisco. Neg. no. FN-27343.

ca. 1910 - Sutro's daughter, Dr. Emma Merritt, had the next Cliff House made of fireproof concrete and steel, designed by brothers named Reid. President Taft dined at this one.

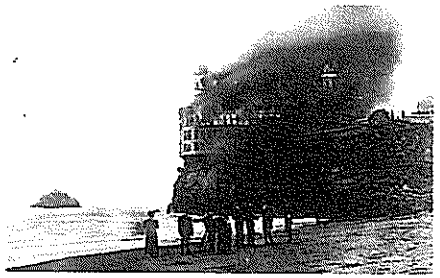
California Historical Society, San Francisco. Neg. no. FN-19319.

ca. 1946 - After a series of owners and a number of years being closed, the Cliff House was bought and refurbished by George and Leo Whitney in 1937. It featured the largest curio shop in the world.

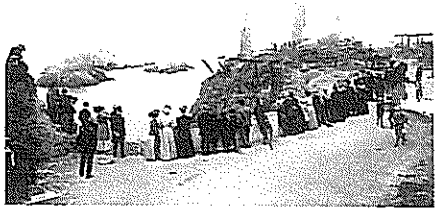
1895 - Adolph Sutro was an engineer accustomed to huge projects. He hired architects C. J. Colley and Emile S. Lemme to design a chateau-style edifice to match the grandeur of the site.



ca. 1900 - Presidents McKinley and Roosevelt dined at Sutro's Cliff House. Eight stories high, it had art galleries and ballrooms as well as dining rooms and bars. Sutro began building a railroad to bring customers to his amusement palace. Solidly nailed to its cliff with iron rods, the building suffered no damage at all from the great earthquake and fire of 1906.



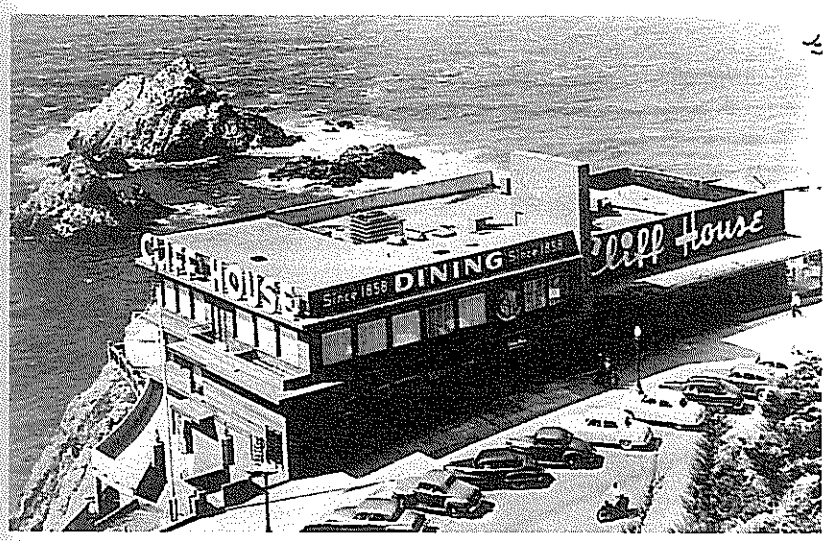
Charles T. Hall. Marilyn Blaisdell Collection.



Turrill & Miller. Marilyn Blaisdell Collection.

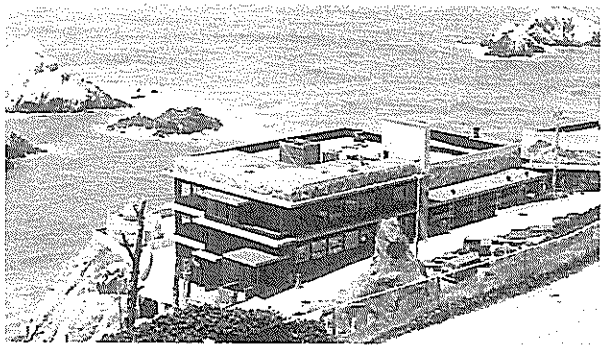
1907 - On September 7, 1907, the dream burned to rubble, with just a few chimneys left standing.

comes and goes. The cliff stays.



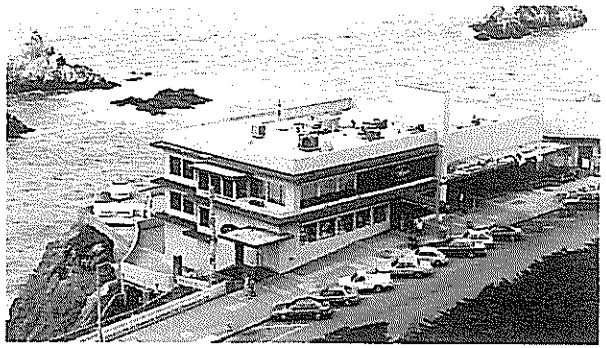
ca. 1954 - In 1950 the Whitney brothers drastically remodeled the building with redwood siding and extended it to the left. The building never did get its dignity back.

1973 - The Cliff House closed again in 1969, then reopened in 1973—during San Francisco's "psychedelic" heyday—with a heady mural of ocean waves and spray. Most of the photos and information on these two pages are from *San Francisciana: Photographs of the Cliff House* (San Francisco: Blaisdell, 1985), by Marilyn Blaisdell. See Recommended Bibliography.

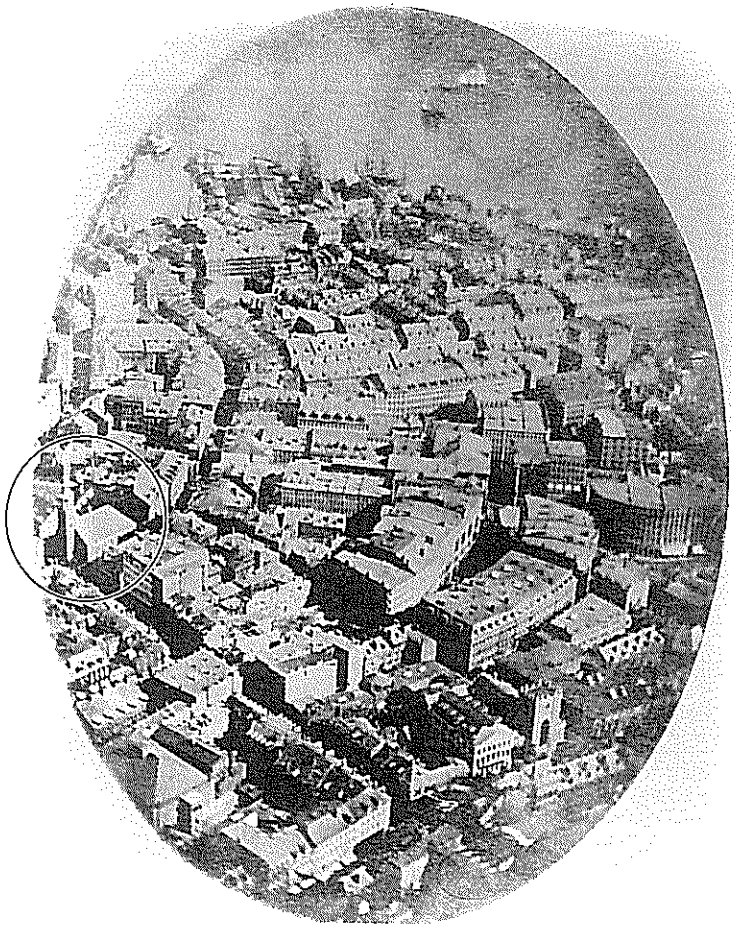


Gregory Gaar. Marilyn Blaisdell Collection.

1991 - In 1977 the National Park Service took over the Cliff House as part of the Golden Gate National Recreation Area. It is appropriately staid and public-spirited in demeanor. Every so often someone revives the fantasy of rebuilding Sutro's extravaganza. Stranger things have happened.

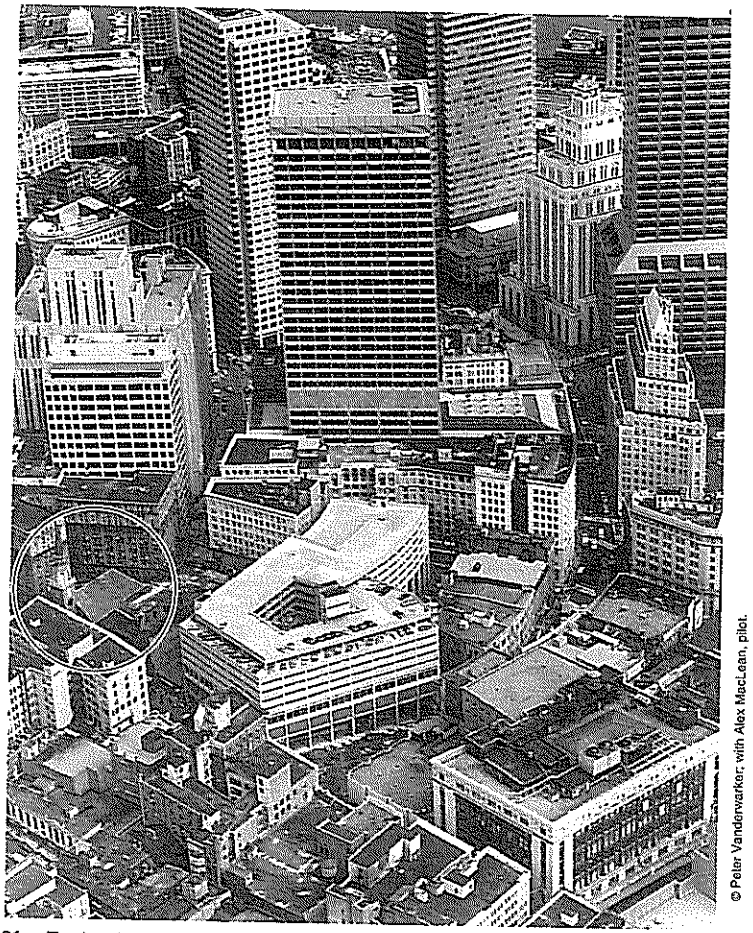


25 October 1991. Brand.



Boston Public Library, Prints Department. Provided by Peter Vanderwarker.

1860 - Looking due east across what is now the financial district of Boston, this was the first aerial photo of an American city—shot by J. W. Black from a balloon tethered at 1,200 feet. Keep your eye on the steepled church at the far left, the Old South Meeting House. This pair of photos is reprinted from the excellent rephotography book, *Cityscapes of Boston*, by Robert Campbell and Peter Vanderwarker (Boston: Houghton Mifflin, 1992. See Recommended Bibliography.)

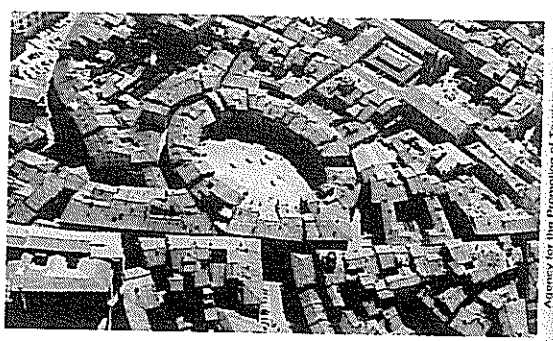


© Peter Vanderwarker, with Alex MacLean, pilot.

1981 - Twelve decades later every single building but one—the Old South Meeting House at far left—is gone. What the great fire of 1872 did not take, real estate pressures did. But the streets are entirely intact, and buildings like the parking lot bent in the middle foreground and the Shawmut Bank building tall and trapezoidal in the middle top, must twist to fit the streets and their angular lots. Milk Street is the curving street on the left; Franklin curves on the right. Washington Street angles down in the foreground from the Old South Meeting House.

(POLITICAL) SITE IS ETERNAL. The streets of Boston, tangled as they are, won't move. Even the skyscrapers must dance to their choreography. In Lucca, Italy, the outline of a Roman amphitheater lives on in the modern city.

ca. 1980 - The oval of an ancient Roman amphitheater in Lucca, Italy, was preserved by gradually turning into private property. When the empire died and the entertainment stopped, people moved into the obsolete structure and made their homes and shops there. Over the centuries all of the original structure was replaced, but its outline persisted in the property lines. The center of the oval eventually became crowded with buildings. The space was reopened into a piazza in the 19th century, the better to attract tourists to the ghost amphitheater.



Agency for the Promotion of Tourism

Duffy's time-layered perspective is fundamental to understanding how buildings actually behave. The 6-S sequence is precisely followed in both design and construction. As the architect proceeds from drawing to drawing—layer after layer of tracing paper—"What stays fixed in the drawings will stay fixed in the building over time," says architect Peter Calthorpe. "The column grid will be in the bottom layer." Likewise the construction sequence is strictly in order: Site preparation, then foundation and framing the Structure, followed by Skin to keep out the weather, installation of Services, and finally Space plan. Then the tenants truck in their Stuff.

Frank Duffy: "Thinking about buildings in this time-laden way is very practical. As a designer you avoid such classic mistakes as solving a five-minute problem with a fifty-year solution, or vice versa. It legitimizes the existence of different design skills—architects, service engineers, space planners, interior designers—all with their different agendas defined by this time scale. It means you invent building forms which are very adaptive."

The layering also defines how a building relates to people. Organizational levels of responsibility match the pace levels. The building interacts with individuals at the level of Stuff; with the tenant organization (or family) at the Space plan level; with the landlord via the Services (and slower levels) which must be maintained; with the public via the Skin and entry; and with the whole community through city or county decisions about the footprint and volume of the Structure and restrictions on the Site. The community does not tell you where to put your desk or your bed; you do not tell the community where the building will go on the Site (unless you're way out in the country).

Buildings rule us via their time layering at least as much as we rule them, and in a surprising way. This idea comes from Robert V. O'Neill's *A Hierarchical Concept of Ecosystems*. O'Neill and his co-authors noted that ecosystems could be better understood by observing the rates of change of different components. Hummingbirds and flowers are quick, redwood trees slow, and whole redwood forests even slower. Most interaction is within the same pace level—hummingbirds and flowers pay attention to each other, oblivious to redwoods, who are oblivious to them. Meanwhile the forest is attentive to climate change but not to the hasty fate of individual trees. The insight is this: "*The dynamics of the system will be dominated by the slow components, with the rapid components simply following along.*"[2] Slow constrains quick; slow controls quick.

The same goes with buildings: the lethargic slow parts are in charge, not the dazzling rapid ones. Site dominates the Structure, which dominates the Skin, which dominates the Services, which dominate the Space plan, which dominates the Stuff. How a room is heated depends on how it relates to the heating and cooling Services, which depend on the energy efficiency of the Skin, which depends on the constraints of the Structure. You could add a seventh "S"—human Souls at the very end of the hierarchy, servants to our Stuff.

Still, influence does percolate the other direction. The slower processes of a building gradually integrate trends of rapid change within them. The speedy components propose, and the slow dispose. If an office keeps replacing its electronic Stuff often enough, finally management will insist that the Space plan acquire a raised floor to make the constant recabling easier, and that's when the air conditioning and electrical Services will be revamped to handle the higher load. Ecologist Buzz Holling points out that it is at the times of major changes in a system that the quick processes can most influence the slow.

The quick processes provide originality and challenge, the slow provide continuity and constraint. Buildings steady us, which we can probably use. But if we let our buildings come to a full stop, they stop us. It happened in command economies such as Eastern

[2] R. V. O'Neill, D. L. DeAngelis, J.B Wade, T. F. H. Allen, *A Hierarchical Concept of Ecosystems* (Princeton: Princeton University Press, 1986), p. 98.

Europe's in the period 1945-1990. Since all buildings were state-owned, they were never maintained or altered by the tenants, who had no stake in them, and culture and the economy were paralyzed for decades.

Slow is healthy. Much of the wholesome evolution of cities can be explained by the steadfast persistence of Site. Property lines and thoroughfares in cities are inviolate even when hills are leveled and waterfronts filled in. After the Great Fire of London in 1666, the city was rebuilt of brick, with widened streets but upon the old ground plan, and with meticulously preserved property lines. A wise move, says urban scholar Kevin Lynch: "Rebuilding was rapid and vigorous because each man could start again on his own familiar land."[3] Exactly the same thing happened two-and-a-half centuries later in San Francisco, after its earthquake and fire of 1906.

Different Site arrangements lead to different city evolutions. Downtown New York City, with its very narrow long blocks, is uniquely dense and uniquely flexible. Quick-built San Francisco is kept adaptable, congenial, and conservative over the decades by its modest lot sizes, according to urban designer Anne Vernez Moudon:

> Small lots will support resilience because they allow many people to attend directly to their needs by designing, building, and maintaining their own environment. By ensuring that property remains in many hands, small lots bring important results: many people make many different decisions, thereby ensuring variety in the resulting environment. And many property owners slow down the rate of change by making large-scale real estate transactions difficult.[4]

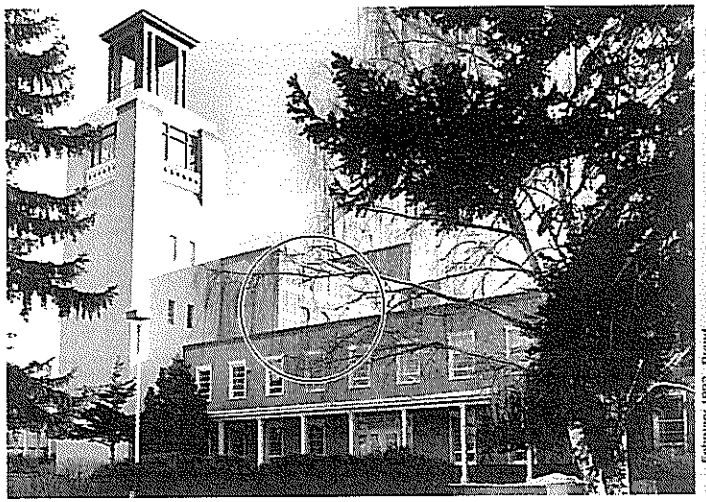
After Site comes Structure, at the base of which is the all-determining foundation. If it is out-of-square or out-of-level, it will plague the builders clear to the roof line and bother

STRUCTURE PERSISTS AND DOMINATES. In Santa Fe's old State Capitol building, the original Structure defined the remodeling possibilites—even with radical changes of Skin, footprint, volume, and interior design.

Anna L. Hase. Museum of New Mexico. Neg. no. 16711.

ca. 1916 - Watch the two arched windows at the upper left of the facade. On this site the first New Mexico State Capitol building was built in 1886 and burned in 1892 (arson suspected.) This domed capitol went up in 1900 but soon proved embarrassing, because around 1920, Santa Fe decided to remodel the whole city to look historical—Spanish Colonial and Territorial style (see Chapter 9 for the strange story).

1992 - The two arched windows are still there, and so is the core Structure, but not much else is visibly the same. Between 1950 and 1953 the building had its dome decapitated, its classical portico demolished, a tower added (along with extensive new space), and the whole thing tricked out with a particularly unconvincing adobe look and Territorial-style detailing such as the brick wall-tops. In 1966 a new Capitol building was built nearby, and this became the Bataan Memorial Building, still housing some state offices.



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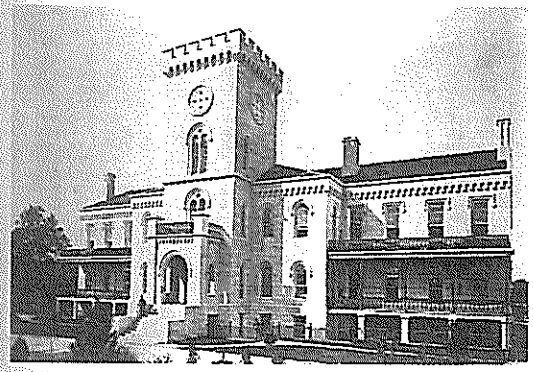
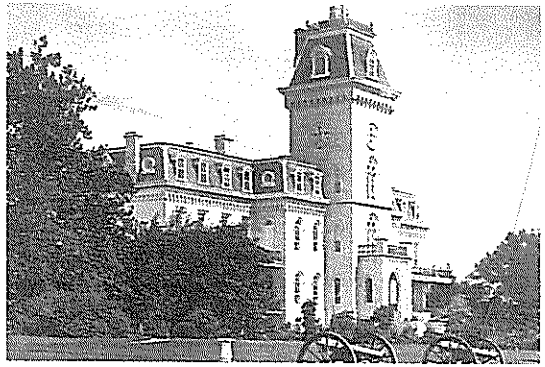


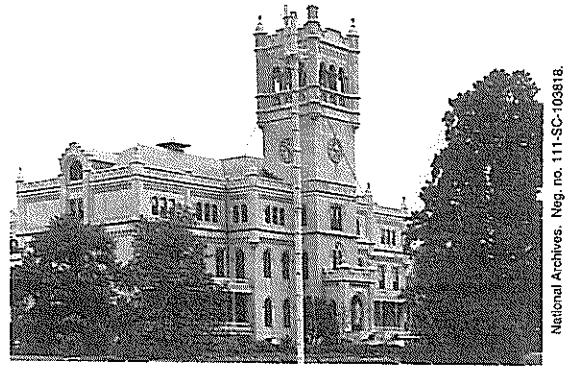
National Archives. Neg. no. 59-HB-3.

ca. 1865 - The US Soldiers' Home (1857) was originally designed to look Italianate by a second lieutenant in the US Army Corps of Engineers. The material was New York marble.



Library of Congress. Neg. no. LC-G7-2002 205602.

ca. 1872 - In 1868 the building camouflaged its expansion upward with a fashionable Second Empire mansard roof. The tower also grew higher and acquired a water tank.



National Archives. Neg. no. 111-SC-103818.

ca. 1910 - In 1884 and 1887 the rear of the building was expanded in a Gothic Revival style, and in 1890 the front of the building caught up, growing still higher in the process. The building has housed veterans from every American war since the War of 1812.

SKIN IS MUTABLE. Even institutional buildings like the Soldiers' Home in Washington DC can't resist periodically shedding old skin for a new.

remodelers for the life of the building. If it is weak, it permanently limits the height of the building. If it lets in water or offers inadequate headroom for the basement, remedy is nearly impossible.

The mutability of Skin seems to be accelerating. Demographer Joel Garreau[5] says that in "edge cities" (new office and commercial developments on the periphery of older cities) developers are accustomed to fine-tune their buildings by changing rugs and facades—a typical "facadectomy" might go upscale from pretentious marble veneer to dignified granite veneer to attract a richer tenant. Developers expect their building Skins to "ugly out" every fifteen years or so, and plan accordingly.

The longevity of buildings is often determined by how well they can absorb new Services technology. Otis Elevator contractors don't bother to make money on their first installation. They know you'll be back soon enough for improved elevators; their profits are in the inevitable renovations. Energy Services such as electricity and gas are driven constantly toward greater efficiency by their sheer expense—30 percent of operating costs, equal over a building's life to the entire original cost of construction. Between the Energy Crisis of 1973 and 1990, the money spent on space heating in new American buildings dropped by a dramatic 50 percent.[6]

Even the home is no refuge from turnover in Services. Houses were revolutionized by the arrival of public water service around 1900, then by public electricity in the 1920s and 1930s, later by cable television in the 1970s. The two most renovated rooms in all houses are the kitchen and bathroom. Building historian Orlando Ridout says that in Maryland, you can find more whole houses from the 1700s than pre-1920 toilets. Whether it's the arrival of colored enamel in the 1920s, the advent of Jacuzzi baths in the 1970s, or guilt about water-wasting toilets in the 1980s, people keep making changes and expanding the significance of the bathroom in their homes. Likewise the kitchen, which has migrated from a back corner to the middle of home life, while stoves, refrigerators, and sinks are replaced as frequently as

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[3] Kevin Lynch, *What Time Is This Place?* (Cambridge: MIT Press, 1972), p. 8. See Recommended Bibliography.

[4] Anne Vernez Moudon, *Built for Change* (Cambridge: MIT Press, 1986), p. 188. See Recommended Bibliography.

[5] Garreau is the author of *Edge City* (New York: Doubleday, 1991). See Recommended Bibliography.

[6] Rick Bevington and Arthur H. Rosenfeld, "Energy for Buildings and Homes," *Scientific American* (Sept. 1990), p. 77.

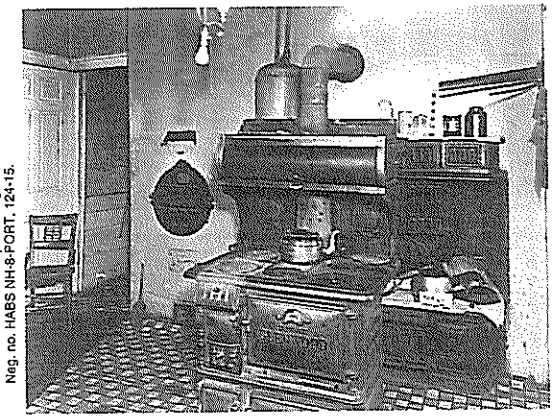
automobiles. Service-connected Stuff will not hold still.

The Space plan and Stuff are what building users have to look at and deal with all day, and they rapidly grow bored, frustrated, or embarrassed by what they see. Between constant tinkering and wholesale renovation, few interiors stay the same for even ten years.

A design imperative emerges: *An adaptive building has to allow slippage between the differently-paced systems of Site, Structure, Skin, Services, Space plan, and Stuff.* Otherwise the slow systems block the flow of the quick ones, and the quick ones tear up the slow ones with their constant change. Embedding the systems together may look efficient at first, but over time it is the opposite, and destructive as well.

Thus, pouring concrete on the ground for an instant foundation ("slab-on-grade") is maladaptive—pipes are foolishly buried, and there's no basement space for storage, expansion, and maintenance and Services access. Timber-frame buildings, on the other hand, conveniently separate Structure, Skin, and Services, while balloon-frame (standard stud construction) over-connects them.

All these shearing layers of change add up to a whole for the building, but how do they add up to a whole for the occupants? How can they change *toward* the humans in them rather than



L. C. Durette. Library of Congress. Neg. no. HABS NH-8-PORT. 124-15.

1936 - SERVICES OBSOLESCE AND WEAR OUT. In the kitchen of the Captain Barnes house (1808) in Portsmouth, New Hampshire, Services-connected appliances were layered on each other. Originally it had a large fireplace. About 1816 a contrivance called the Rumford Roaster was added on the left (round plate). Then a stove was built into the fireplace (probably 1840s), and a later stove (probably around 1900) crowded in front of it. Also visible are a water heater (cylinder behind the stove), rack for drying clothes on the right, and a bare electric light.

T. Harmon Parkhurst. Museum of New Mexico. Neg. no. 50987

ca. 1935 - A series of cafes have occupied this building on the corner of Don Gaspar and Water streets in Santa Fe, New Mexico. Its corner location near the central plaza kept it busy, but cafes are ephemeral enterprises.

T. Harmon Parkhurst. Museum of New Mexico. Neg. no. 49988

ca. 1935 - A soda fountain and booths dominated the Space plan of the K. C. Waffle house. It said, just as clearly as the sign outside, "Tourists, come in as you are." Southwestern style is evident in the tile and leather.

T. Harmon Parkhurst. Museum of New Mexico. Neg. no. 50967. 13 March 1991. Brand.

1991 - The K. C. Waffle House became the Mayflower Cafe, then Golden Temple Conscious Cookery (1974-1977), then Pogo's Eatery (1977-1979), then Cafe Pasqual's (1978-?).

T. Harmon Parkhurst. Museum of New Mexico. Neg. no. 50968. 13 March 1991. Brand.

1991 - The Space plan of Pasqual's features a raised seating area by the entrance and added rest rooms at the back. While the exterior shows a modest effort at deepening "authenticity," the interior motif is clamorously Mexican. The cooking is Santa Fe chic.

INTERIORS CHANGE RADICALLY while exteriors maintain continuity. The Space plan is the stage of the human comedy. New scene, new set.

away, as so many seem to do? Here the leading theorist is Christopher Alexander. A long-time professor of architecture at the University of California, Berkeley, Chris Alexander is the author of an influential series of books from Oxford University Press which explore in practical detail what it is that makes buildings and communities humane—or more precisely, what makes them become humane over time.[7]

A design professional of depth—his 1964 *Notes on the Synthesis of Form* is still in print—Alexander is inspired by how design occurs in the natural world. "Things that are good have a certain kind of structure," he told me. "You can't get that structure except dynamically. Period. In nature you've got continuous very-small-feedback-loop adaptation going on, which is why things get to be harmonious. That's why they have the qualities that we value. If it wasn't for the time dimension, it wouldn't happen. Yet here *we* are playing the major role in creating the world, and we haven't figured this out. That is a very serious matter."

Applying this approach to buildings, Alexander frames the design question so: "What does it take to build something so that it's really easy to make comfortable little modifications in a way that once you've made them, they feel integral with the nature and structure of what is already there? You want to be able to mess around with it and progressively change it to bring it into an

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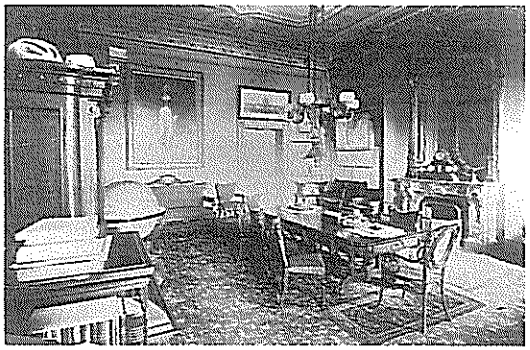
7 Alexander's "yellow books" from Oxford University Press, each with a variety of co-authors, are: *The Timeless Way of Building* (1979); *A Pattern Language* (1977); *The Oregon Experiment* (1975); *The Production of Houses* (1985); *The Linz Café* (1981); *A New Theory of Urban Design* (1987). See Recommended Bibliography. A reviewer in *Architectural Design* called *A Pattern Language* "perhaps the most important book on architectural design published in this century."

STUFF JUST KEEPS MOVING. The Treaty Room of the White House has had the same Space plan since 1817—except for a temporary partition installed for Abraham Lincoln in 1861. But the furniture and fittings blinked in and out of the room as administrations and fashions came and went, and the room's use varied from bedroom to outer office, to Cabinet room, to inner office, to sitting room, to library.

ca. 1891 - On the second floor of the White House, what is now called the Treaty Room is connected by an inner door to the Oval Office. It has always been an intimate part of the President's family or work life. In President Benjamin Harrison's administration (1889-1893) it was used as the Cabinet Room, dominated by President Grant's table for Cabinet meetings in the middle. Watch the chairs, the rug, the chandelier, fireplace and its mirror, and the pictures on the wall.

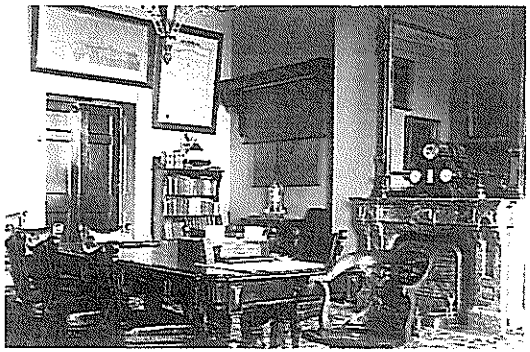
Library of Congress. Neg. no. LC-698 81340.

ca. 1895 - President Grover Cleveland (1893-1897) has a different chair for himself at the head of the Cabinet table, and there's a new chandelier. A framed picture in the corner has changed, and the bookshelves there are gone. (In 1993 the Cabinet table was still in this room—as President William Clinton's desk.)



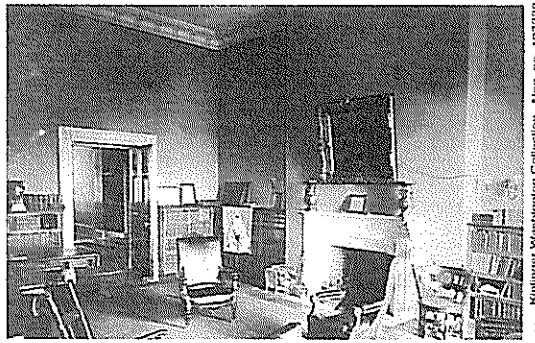
White House Collection.

ca. 1899 - President William McKinley (1897-1901) has a new chair, new rug, and a new fireplace screen, but the chandelier and the framed picture and bookshelves in the corner from Harrison's era have returned. McKinley was the first of several presidents to use the room as his private office. In this room he signed the declaration of war with Spain in 1898 and five months later signed with the ambassador of France the protocols for the peace conference—hence, the Treaty Room.



Library of Congress. LC-698 81333.

ca. 1911 - The White House was drastically remodeled by architect Charles McKim in 1902, during Theodore Roosevelt's administration. President William Taft (1909-1913) continued Roosevelt's use of the Treaty Room as his office. The door trim was the same, but the fireplace, ceiling cornice, furniture, shelving, rug, and pictures all were different.

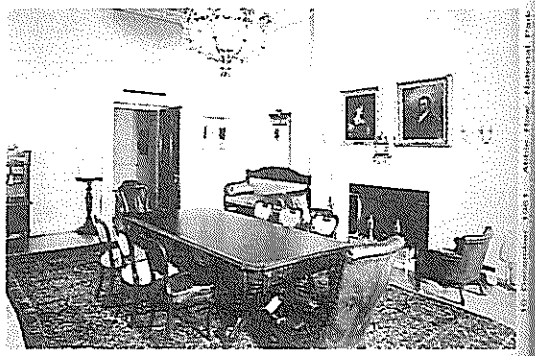


Kiplinger Washington Collection. Neg. no. 107330

1931 - President Herbert Hoover (1929-1933) had a wife, Margaret, whose ambition was to convert the Treaty Room to the "Monroe Drawing Room." It had been used as an inner sanctum office by President Woodrow Wilson, then as a sitting room by Warren Harding and Calvin Coolidge. Mrs. Hoover sought antique furniture from the period of President James Monroe (1817-1825). She found a chandelier that had been discarded from the Green Room (the state room just below this one).

White House Collection. Neg. no. 93

1961 - President John F. Kennedy (1961-1963) also had a wife, Jacqueline, who loved to supervise interior design. The room looked like this after Roosevelt, Truman, and Eisenhower. (During Truman's administration, the entire building was gutted and rebuilt—this room had the same trim, fireplace, and chandelier, but the walls, ceiling, floor, and windows were new construction. The Space plan had altered not an inch.)



1963 - Jackie Kennedy helped found the White House Historical Association, and she brought in French interior designer Stefan Boudin. Their version of the Treaty Room restored over the fireplace a massive ornate mirror of the kind that was there when McKinley signed the peace protocols with Spain. On the wall is an 1899 painting of the very event. The table and chairs were kept, along with the chandelier that Mrs. Hoover fancied.


Kiplinger Washington Collection. Neg. no. 107330.


White House Collection. Neg. no. 63.


10 December 1961. Abbie Row, National Park Service. White House Collection. Neg. no. 6333-21.


5 March 1963. Robert C. Knudson, White House Collection. Neg. no. 513103.

adapted state with yourself, your family, the climate, whatever. This kind of adaptation is a continuous process of gradually taking care." You can recognize the result where that process is working, he writes. "Because the adaptation is detailed and profound, each place takes on a unique character. Slowly, the variety of places and buildings begins to reflect the variety of human situations in the town. This is what makes the town alive."[8]

While all buildings change with time, only some buildings improve. What makes the difference between a building that gets steadily better and one that gets steadily worse? Growth, apparently, is independent of adaptation, and spasmodic occupant-turnover can defeat adaptation.

Growth follows a simple goal of property owners: maximize what you control. The practice is ancient. In old cities of Europe and the Mideast, upper stories would jetty out farther and farther to increase the space on each floor, until neighbors could shake hands across the street from upper rooms. Now as then, more space in domestic buildings is equated with freedom. In commercial buildings, more space means profit. In institutional buildings, it means power. Everyone tries to get more than they're allowed. City councils often seem to discuss little else. But only sometimes are additions an improvement. Adding more rooms around the periphery of a building, for instance, often leaves the middle dark and desolate.

The opposite of adaptation in buildings is graceless turnover. The usual pattern is for a rapid succession of tenants, each scooping out all trace of the former tenants and leaving nothing that successors can use. Finally no tenant replaces the last one, vandals do their quick work, and broken windows beg for demolition. There are two forms of surcease. If there is a turnaround in local real estate, the succession of owners and tenants might head back upscale, each one adding value. Or the building may be blessed with durable construction and resilient design which can forgive insult and hard swerves of usage. A brick factory from the 1910s, with its intelligent daylighting and abundant space, can stand empty for a decade and still gain value.

Age *plus adaptivity* is what makes a building come to be loved. The building learns from its occupants, and they learn from it.

There is precedent for thinking this way. In classical Greece and Rome, *domus* meant "house" in an expanded sense:

> People and their dwellings were indistinguishable: domus referred not only to the walls but also to the people within them. Evidence for this is found in inscriptions and texts, in which the word refers now to one, now to the other, but most often to both at once, to the house and its residents envisioned as an indivisible whole. The architectural setting was not an inert vessel; the genius of the domus, honored by a cult, was the protector of both the place and the people who lived in it.[9]

That kind of bonding between building and inhabitants still occurs. The next two chapters explore seemingly opposite examples of it—two kinds of buildings that easily become loved. One, grand and deep, I call the High Road—durable, independent buildings that steadily accumulate experience and become in time wiser and more respected than their inhabitants. The other, quick and dirty, is the Low Road. Their specialty is swift responsiveness to their occupants. They are unrespectable, mercurial, street-smart.

Among buildings as within them, differences of pace are everything.

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[8] Christopher Alexander, *The Timeless Way of Building* (New York: Oxford University Press, 1979), p. 231.

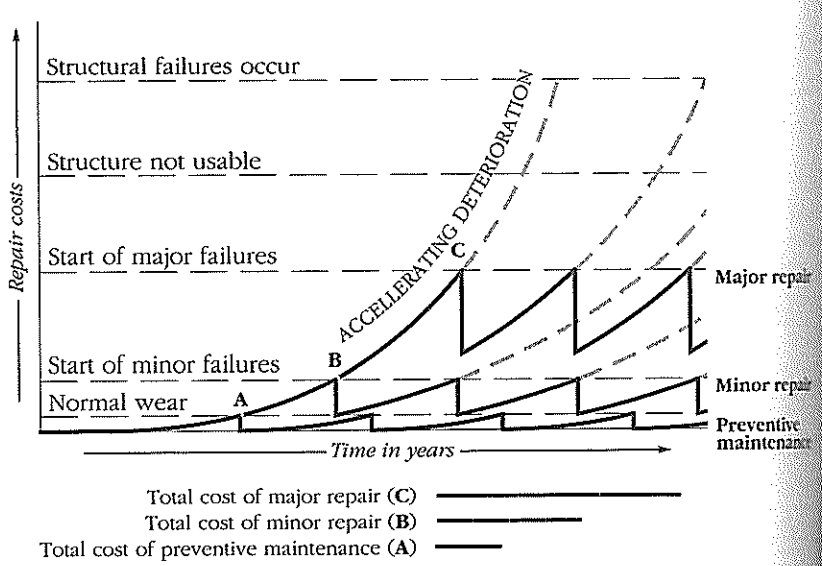
[9] Yvon Thébert, "Private Life and Domestic Architecture in Roman Africa," *A History of Private Life*, 5 vols. (Cambridge: Harvard Univ. Press, 1985, 1987), vol. 1, p. 407.

The sequence of effects of deterioration on ordinary buildings has never been formally studied—a curious lapse, considering the massive capital loss involved—but some rules of thumb have emerged. Due to deterioration and obsolescence, a building's capital value (and the rent it can charge) about halves by twenty years after construction. Most buildings you can expect to require complete refurbishing from eleven to twenty-five years after construction.[2] The rule of thumb about abandonment is simple: if repairs will cost half of the value of the building, don't bother. This is the point at which owners either demolish the place (often leaving a vacant lot, which is considered to be more salable than a shabby building, to the despair of city planners and preservationists), or they burn it for insurance, or they let it stand empty.

An empty building rots fast and attracts trouble. Once it is left unheated and unventilated, any moisture that gets in immediately begins causing serious damage, with no one around to notice or worry. Vandals smash the windows, letting in more rain, and they trash the interiors. Now considered an eyesore and a hazard by the community, the building won't be allowed to continue much longer.

Since the downward spiral of dilapidation can accelerate so quickly, the trick is to keep a building from entering the spiral at all. Two methods are supposedly standard, but both are in practice somewhat rare. One is "preventive maintenance"—routinely servicing materials and systems in the building *before* they fail, thereby saving considerable expense and greatly extending the life of the building. The other is designing and constructing the building in such a way that it doesn't need a lot of maintenance. Both are unpopular. Solid construction? Expensive! Preventive maintenance? BORing.

Building maintenance has little status with architects. They see the people who do the maintaining as blue-collar illiterates and the process of upkeep as trivial, not a part of design concerns. As a result of this attitude, Pompidou Centre (1979) in Paris, the spectacular inside-out arts complex designed by Sir Richard



PREVENTIVE MAINTENANCE (bottom line) not only costs markedly less in aggregate than repairing buildings failures, it reduces human wear and tear. A buildings whose systems are always breaking or threatening to break is depressing to the occupants, and that brings on another dimension of expense. This diagram is adapted from *Preventive Maintenance of Buildings* (New York: Van Nostrand Reinhold, 1991), p. 3.

Rogers and Renzo Piano supposedly to accommodate all manner of change, cannot accommodate what the weather does to all the exposed piping. The place became an exorbitant scandal of rust and peeling paint. But even ordinary office buildings suffer from the lapse. According to *The Occupier's View*, the survey of fifty-eight new business buildings near London, "a staggering one-fifth of the sample said that the need to clean their windows had not even been considered during the design and construction of the building."[3] Also lighting fixtures in the grand lobbies were unreachable for lamp replacement, and internal drains from the flat roofs had no access hatches for inspection and cleaning.

Incompetent design often is matched by hurried, shoddy construction, which can be concealed or can get by on being just good enough, just long enough. A building scientist I talked to

divided into "preventive" and "corrective." In-house maintenance staffs are on call 24 hours a day, and all working equipment is kept in good-as-new condition. So far as I know, ships and hospitals have never been studied as design exemplars for other kinds of buildings.

Too often a new building is a teacher of bad maintenance habits. After the initial shakedown period, everything pretty much works, and the owner and inhabitants gratefully stop paying attention to the place. Once attention is deferred, deferring of maintenance comes naturally. It might be better if some of the original work were intentionally ephemeral, with everyone knowing it will require maintenance or replacement within a year. "How might a new building teach good maintenance habits?" is a question worth giving to architecture students.

Maintenance comes in two major flavors, especially around houses—cosmetic and real. Unfortunately the cosmetic is more fun. It's like the weekend sailor who puts loving attention into his sailboat's varnished brightwork and lets the engine rust. Serious sailors paint over the brightwork and lavish their fretful attention on the engine, laying in a spare water pump and extra fan belts. Maybe the trick for homeowners is to mix serious and frivolous chores: replace the air filter in the furnace, then go putter in the garden. Or be sure that any repair includes the reward of some improvement. The temptation to avoid is concealing the need for real work with a cosmetic touch-up—painting the rot.

Deborah Devonshire accords high status to the keepers of Chatsworth and its lands and celebrates their tasks:

> In the house and out of doors vigilance and maintenance, unseen and unsung, are the order of the day's work. Nothing is permanent. Lead on the roof wears thin, and a hole the size of a pinhead lets in rain which can soon turn into dry rot. Stone, especially when bedded the wrong way of its grain, flakes, and the weather finds the weak places and scoops them out as if with a giant spoon.... Wormwood, death-watch beetle, fire, water, snow, frost, wind and sun (All Ye Works of the Lord, in fact) each does its special harm.[29]

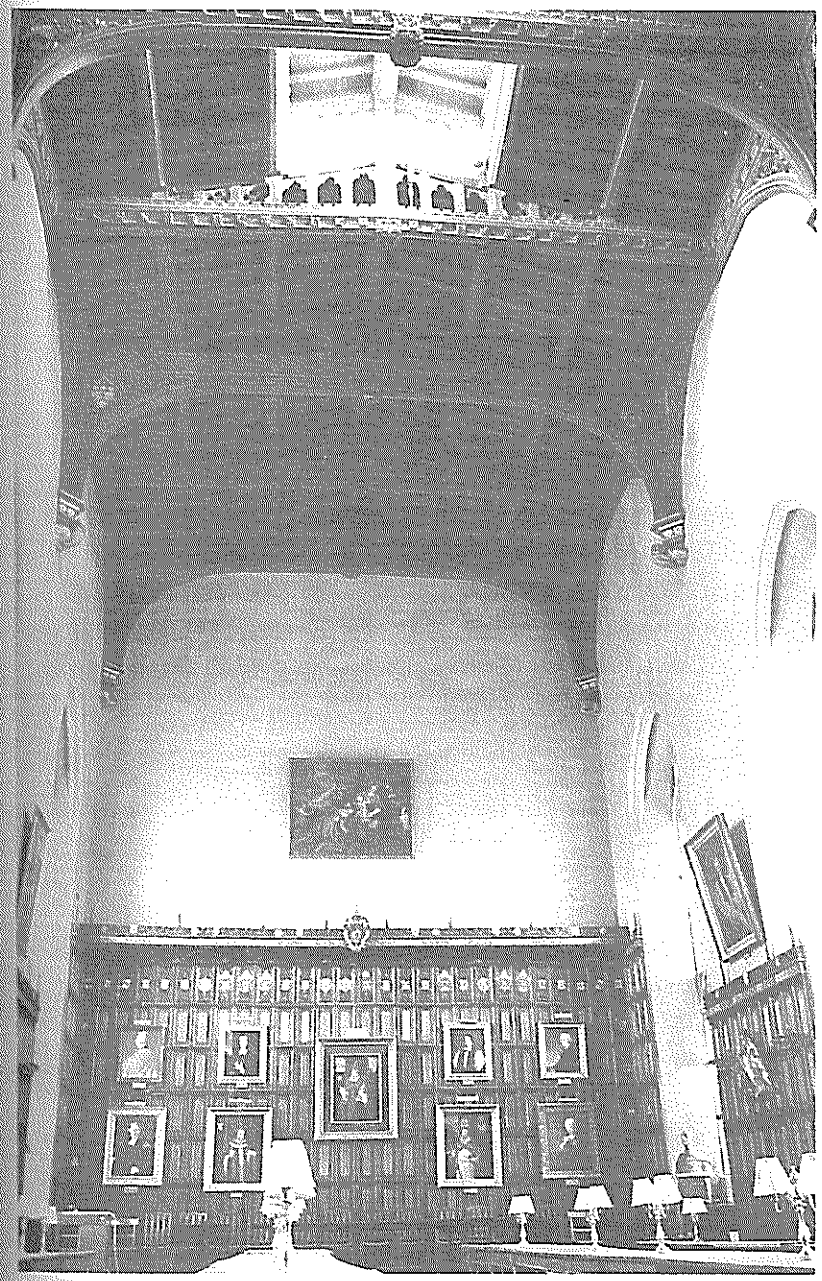
Against the flow of this constant entropy, maintenance people must swim always upstream, progressless against the current like a watchful trout. The only satisfaction they can get from their work is to do it well. The measure of success in their labors is that the result is invisible, unnoticed. Thanks to them, everything is the same as it ever was.

The romance of maintenance is that it has none. Its joys are quiet ones. There is a certain high calling in the steady tending to a ship, to a garden, to a building. One is participating physically in a deep, long life.

The anthropologist/philosopher Gregory Bateson used to tell a story:

> New College, Oxford, is of rather late foundation, hence the name. It was founded around the late 14th century. It has, like other colleges, a great dining hall with big oak beams across the top, yes? These might be two feet square, forty-five feet long.
>
> A century ago, so I am told, some busy entomologist went up into the roof of the dining hall with a penknife and poked at the beams and found that they were full of beetles. This was reported to the College Council, who met in some dismay, because where would they get beams of that caliber nowadays?
>
> One of the Junior Fellows stuck his neck out and suggested that there might be on College lands some oak. These colleges are endowed with pieces of land scattered across the country. So they called in the College Forester, who of course had not been near the college itself for some years, and asked him about oaks.

[29] Deborah Devonshire, *The House* (London: Macmillan, 1982), p. 83.



September 1990. Brand.

1990 – The new oak beams of New College, Oxford, were installed in 1865 by Gothic Revivalist Gilbert Scott, using timbers from college estates at Great Horwood and Akely in north Buckinghamshire. The building is the oldest surviving college hall at Oxford, completed in 1386 by Bishop William of Wykeham (master mason, William Wynford). The now-windowed opening in the roof was originally to let out smoke from an open fire in the center of the hall.

And he pulled his forelock and said, "Well sirs, we was wonderin' when you'd be askin'."

Upon further inquiry it was discovered that when the College was founded, a grove of oaks had been planted to replace the beams in the dining hall when they became beetly, because oak beams always become beetly in the end. This plan had been passed down from one Forester to the next for six hundred years. "You don't cut them oaks. Them's for the College Hall."

A nice story. That's the way to run a culture.

Every time I've retold this story since I first heard it from Gregory in the 1970s, someone always asks, "What about for the next time? Has a new grove of oaks been planted and protected?" I forwarded the question to the authorities at New College—the College Archivist and the Clerk of Works. They had no idea.