CHAPTER 10

Function Melts Form: Satisficing Home and Office

MOST building *adaptation* is, like most building evolution, vernacular.

You don't have to look far to see it. The majority of people live in houses they own (64 percent of households in America, 66 percent in Britain).[1] The majority of workers work in offices (over 50 percent and still rising). Apart from high-turnover retail spaces, where do you find the highest rates of change within contemporary buildings? In owner-occupied houses and in office buildings. Whereas the remodeling of shops and restaurants is often the work of professional designers, the constant change in homes and offices is usually done by the occupants in a manner classically vernacular—informal, pragmatic, alive with offhand ingenuity, officially invisible. Direct, amateur change is the norm.

1986 - The Ragona family of Point Reyes, California. The idiosyncratic tower house with the great view of Tomales Bay had been owner-built in the 1970s in imitation of a lifeguard tower at a nearby beach. Tony Ragona recalls thinking in 1985, when he bought the place,"It was what we called in Philadelphia a 'trinity house'—three rooms above each other, with the kitchen on top. Only it was in the country." Right to left: Tony Ragona (40), his wife Virginia Drorbaugh (34), Travis (1), Seth (3); and Tony's sons by a previous marriage, Mark (10), and Steven (12), with the dog "Lady" between them. The cars are a '79 Volkswagen Rabbit and '72 Ford station wagon. (The photos are by Art Rogers—part of his renowned series, "Yesterday and Today.")

EVERY HOUSE IS A "BIOGRAPHY" HOUSE—like Washington's, Madison's, and Jefferson's—to some degree. Families can't help changing, and their homes can't help changing with them.

That's what was left out so badly in Modernist theory and still hasn't been corrected. A Modernist tract of 1940 stated:

> The essence of the new residential architecture is revealed in its twofold purpose: to base its plans upon the organic life of the family to be housed, and to make logical use of the products of invention. It has elected to make a fresh approach, to free itself of constraints, by consciously ignoring tradition and the expectations which the latter imposes with regard to facade and plan. *The outward form of the modern house becomes the outgrowth of a plan built around the interests, routine activities, and aspirations of the client and his family* expressed in terms of materials employed. Thus human need comes first. In skillful hands new appropriate and beautiful forms may emerge from an architecture which, discarding style, lets the house grow from the inside outwardly to express the life within.[2]

This "inside-out" design approach was thrilling, but it made the profound mistake of taking a snapshot of the high-rate-of-change "organic life" within a building and immobilizing it in a confining carapace—the expensive, low-rate-of-change Structure and Skin of the building. Too eager to please the moment, over-specificity crippled all future moments. It was the image of organic, not the reality. The credo "form follows function" was a beautiful lie. Form froze function.

It didn't matter. Life charges on and pushes mere material out of its way. Roofs can be raised; concrete walls are not *that* hard to

© Art Rogers/Point Reyes.

1992 - Six years later. The former kitchen on the top floor became the master bedroom. In 1987, Tony expanded with a high-ceilinged, shed-roofed addition on the left to make a combination living-room-dining-room-kitchen. He hired pros for the framing and did the finish work himself. The bottom floor became a studio for artist Virginia. The tower's original redwood siding wasn't holding up well, so in 1988 Tony put new plywood siding over it to match what was on the addition—adding vertical wood strips for a board-and-batten look. He installed double-glazed windows. Elsewhere on the four-acre property the family added a small workshop, a yurt-style second unit rented out as a bed-and-breakfast, a massage pool, and some thirty trees. The cars now are an '83 Volkswagen Jetta and an '82 Toyota pick-up. The people (and dog) are the same.

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[1] In 1991 some 60.3 million of America's 94.3 million households were owner-occupied. The rest were rented, according to the US Census Bureau.

[2] James and Katherine Morrow Ford, *The Modern House in America* (New York: Architectural Book, 1940), reprinted as *Classic Modern Homes of the Thirties* (New York: Dover, 1989), p. 8. The italics are mine.

cut. The real action is all at the levels of Services, Space plan, and Stuff anyway. Function melts form. You can stupefy a building all you want and it will still learn.

Start with the home: such a melodrama. Within and behind the family situation comedy, the house itself is torn between fantasy and reality, driven toward change by the conflict. The house always aspires to be one thing and is obliged to be another. The fantasy was stated with suitable italics by Sir Henry Wotton in 1624:

> Every Mans proper *Mansion* house and Home, being the *Theater* of his *Hospitality*, the *Seate* of his *Selfe-fruition*, the *Comfortable part* of his own *Life*, the *Noblest* of his Sonnes *Inheritance*, a kinde of private *Princedome*; Nay, to the *Possessors* thereof, an *Epitomie* of the whole *World*: may well deserve by these *Attributes*, according to the degree of the *Master*, to be *decently* and *delightfully* adorned.[3]

In architect Sim Van der Ryn's modern translation, "Everyone who can afford it wants their home to be a nightclub big enough to entertain and impress everybody they know." High-end houses are vastly oversized and overpriced as a result, and low-end and middle houses are always installing tokens of immensity such as jacuzzi baths, coach lamps, foundation planting, and swimming pools.[4]

Fantasy palls, but reality sustains. One old house in Ireland inspired this comment:

> Home can be about architecture or a place in geography; or it can be about the sense of permanence we come to know through habit: an article of clothing repeatedly worn, a favorite turn of phrase, a melody of which we are fond, or the many visits to see a friend. Home is about the familiar, about gravity, about falling back into the self after being dispersed and overextended in the world.[5]

Far from being an Epitomie of the World and place of Selfe-fruition, home is where you fall back into the self *from* the world, a place of honesty instead of aspiration, habit instead of ambitious striving. Returning to it you say with a sigh and double meaning: I'm home. (I've come home and I *am* home.)

The combat of extrovert fantasy and introvert reality was fought with fierce unconsciousness in many a 1950s home. Mom, driven mad by boredom and loneliness in her Epitomie of the World, shoved the furniture around, replaced the sofa and the drapes, and showed her accomplishments proudly to Dad, who came home exhausted from work to discover that his favorite chair had been given to the Goodwill. In time this process led to the bumper-sticker observation, "A man's garage is his castle." By the 1980s, married women had joined the workforce, and the favorite chairs of both sexes became safe.

You can find a vibrant combination of fantasy and reality in any

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3 From Wotton's *The Elements of Architecture*, quoted by Peter Thornton at the front of his spectacular work, *Authentic Decor* (New York: Viking, 1984).

4 During the period 1960 to 1990, American homes grew by 50 percent to an average of 2,500 square feet at the very time that the average number of people in a house was diminishing from 3.4 to 2.7. Buyers apparently wanted houses not so much for themselves as for imagined future buyers, and architects didn't like the extra design work involved in smaller houses. "You need twice the design time and you get only half the fee," said one. Jerry Ackerman, "Changes Hit Families Where They Live," *San Francisco Examiner* (10 Jan. 1993), p. F1 (reprinted from *Boston Globe*).

5 Andrew Bush, *Bonnettstown* (New York: Abrams, 1989), p. 12. Home reality at its best is portrayed in photo and word in this book, which records the fading glory of a well-lived grand old house near Kilkenny, Ireland. See Recommended Bibliography.

6 Robert Dahlin, "Home is Where the Sales Are," *Publishers Weekly* (22 June 1992), p. 34.

7 Carolyn Anthony, "A Book in Every Toolbox," *Publishers Weekly* (2 Nov. 1990), pp. 25-30.

8 US Bureau of the Census, in *Housing Market Statistics* (May 1992) from the National Association of Home Builders, p. 30.

9 David E. Nye, *Electrifying America* (Cambridge: MIT, 1990), p. 253. Electricity for the home was a feminist issue of the time.

10 Estimates in 1993 claimed that 20 to 40 million Americans worked at home at least part-time—18 to 36 percent of the workforce, and that the number was growing at a rate of perhaps 14 percent a year.

untrammeled teenager's room, with its comforting clutter, passing hobbies, and garish posters—the room a sluice gate for the teenager's world. The mix is carried over into college rooms, architectural-student work areas, and increasingly, I would predict, in adult offices.

There's a fascinating fantasy/reality gradient in English country homes—proceeding from the always-public state rooms to the grand family rooms to the humble servants' rooms. It was the servants' quarters that turned out to be the most humane and easy to adapt, and many a member of the upper crust has retired gratefully to them, having turned over the front of the house to paying tourists.

Fantasy-based change in homes comes in blurts, but, except for the elderly, reality-based change is constant and relentless. Babies arrive, become kids, become older kids, leave; dependent aging relatives arrive, die; money comes, money goes; divorce hovers; careers change; everybody keeps on maturing in their tastes and activities. Meanwhile the world keeps tempting fantasy with niftier gadgets for entertainment, kitchen, and bathroom, and now that we've got a home gym and a sauna, how about a rock garden?

Do-it-yourself home improvement is a huge, growth industry. Back in 1980 Americans spent $44 billion on home improvement materials, tools, books, etc. And that was a fraction of the real economic event; the value of the unpaid labor involved—and the final improvement value—has never been estimated. Nevertheless by 1990, ten non-inflationary years later, the annual amount spent had nearly tripled to $110 billion, and the collapse of real estate would send it higher still as people replaced trading up with fixing up.[6] A book titled *The Router Handbook* (a router is a power tool for specialized shaping) sold 700,000 copies between 1983 and 1990—ten times greater than Witold Rybczynski's bestseller, *Home: A Short History of an Idea.* Go ten times greater still to 8 million, and you have the worldwide sales since 1973 for the *Reader's Digest Complete Do-It-Yourself Manual.*[7]

That's the amateur work. In 1980 professional home remodeling came to $46 billion (this number includes labor). By 1990 it was $107 billion.[8] There's an interesting reversal in those numbers—in 1980 more was spent on professional remodeling than on amateur; by 1990, amateur was ahead.

What was everybody doing with that money? A lot of it is just keeping up with the times. Ever since about 1880, changes in technology and society have put increasing strain on houses. Victorian houses were "industrialized" by the arrival of city water and gas, transforming kitchen and bathroom, and night use. When city electricity replaced gas (by 1920), small rooms that were kept closed to conserve heat and restrict the gas smell gave way to a more open plan. Architects weren't interested in electricity, but women and builders were—women for the convenience of use, builders for the convenience of construction.[9] Materials kept improving. Plate glass changed windows, concrete changed foundations, plywood and sheetrock changed walls. Coal furnaces converted to oil, and suddenly the basement was usable for workshop and rumpus room.

Families shrank, servants disappeared, the car arrived. Telephones changed the home's connectivity, and television changed it again—even demanding its own room. Economically, the home had been completely transformed in a hundred years from a place of production to a place of consumption, but that didn't hold still either. With the coming of personal computers and burdensome commutes, millions began using the home as an office, a place of production in the information economy.[10] And social change kept accelerating. Nuclear families exploded. Energy costs suddenly mattered. The whole society got older.

While trying to be a refuge from all this change, the home became its most fluid physical expression. People responded to the new needs and desires with direct, vernacular action. J. B. Jackson has noted, for instance, how the conversion of the home into a center for recreation and entertainment proceeded after the late 1930s:

PORCHES ARE PSEUDOPODS. Sometimes the household flows into them; sometimes they withdraw. Between growth pressure from within and weather stress from without, porches seldom last.

ca. 1915 - A late-19th-century summer house on the island of Nantucket (Massachusetts) appears to have already added a separate bedroom on the left and a wraparound porch on the right.

John W. McCarley. Both photos from his *Nantucket Yesterday and Today* (New York: Dover, 1981), p. 38. See Recommended Bibliography.

1975 - Sixty years later, there are signs that successive generations are sharing the summer house. Part of the wraparound porch has been glassed in, and half of the back porch has been absorbed into the house. Meanwhile, the gambrel-roofed back wing has acquired two more dormer windows upstairs, and the back bedroom has grown a second story. Three sets of wood steps rotted and were replaced. Somebody got tired of the shutters. Wood shingles disguised the surgical scars.

There is in fact scarcely a space in the modern American dwelling that owners themselves have not transformed in keeping with this new image. Even the backyard, freed of its clothesline and rubbish and of the obsolete garage, became a recreation area well before homebuilders saw its potential charm. Barbecue pit, plastic wading pool, power lawnmower, all antedate the developers' concept of Holiday Homesteads. And the garage as a family center half outdoors, part work area, part play area, is also a family invention, not the invention of designers.[11]

We begin to understand why site-built, platform-frame houses have persisted so long in America. Site-built is site-rebuildable, much more than factory-made housing, even mobile homes. Platform frame—2-by-4 wood stud walls raised a floor at a time—is an amateur medium. You can build or rebuild an entire house with a power saw and a hammer (I did so once in Nova Scotia). For reasons unknown—perhaps our frontier history—Americans revel in doing major home projects themselves, and so we stick with forms that give us that freedom.

Consider the life history of the porch, the most conspicuously

19 November 1921. Wesley Bradfield, Museum of New Mexico, Neg. no. 51927. The photo is in Sheila Morand's *Santa Fe Then and Now* (Santa Fe: Sunstone, 1984), p. 68.

1921 - Carlos Vierra was the first artist to move permanently to Santa Fe, New Mexico—hundreds came later. His photographic studies of Indian pueblos and Spanish colonial villages were a major part of the inspiration of Santa Fe style (Chapter 9) and of his own house at 1002 Old Pecos Trail. Partially funded by territorial senator Frank Springer to be a model of a Santa Fe style house, it was built by Vierra himself over several years (1918-1924). He was the first of countless artists in the region to fall in love with the scuptural qualities of adobe.

13 March 1991. Brand.

1991 - Vierra's three porches (called *portales* in New Mexico) didn't last long in the high mountain winters. The one at the far left rotted away, and the other two—middle and upper-right—were filled in. Still in use as a home, Vierra's house was his most influential work of art, prefiguring thousands like it in the region.

dynamic element of the American house. From the 1840s onward, porches became a highly popular add-on. They were the setting of many people's fondest memories, of summer evenings and lemonade, of a time when a whole town knew each other and said hello. The porch was an outdoor room, simultaneously intimate and public.[12] But its sheer exposure made it ephemeral. Rain and sun ate the wood floor and steps, the roof supports, and especially the wood piers. "Of all the woodwork exposed to the elements," says an experienced carpenter, "none is so vulnerable as the white pine porch railing. With the right combination of faulty detailing and wind-driven rain, a railing can be reduced to

[11] J. B. Jackson, "The Domestication of the Garage," *The Necessity for Ruins* (Amherst: Univ. of Mass., 1980), p. 109.

[12] Folklorist Henry Glassie tells how the porch also was a bond between rural and urban values: "In the rural southern United States the idea of the home characteristically includes an external social space, a wide porch or shady yard, where encounter is casual and informal and continual. When people from such settings move to northern cities they provide different environments with simple tests of their quality. If these southern people, most conspicuously black people, are packed into high rise apartment buildings, designed on analogy with buildings that please upper class urbanites so that they include private cubicles but not places for casual gathering, the people correctly rebel against the building, forcing it to decay rapidly, making it an unpleasant, alienated scene. But when the same people move into late Victorian houses in formerly bourgeois white neighborhoods, where houses are supplied with deep front porches and the shady streets before them provide places to gather, they lavish affection on their houses and recreate the easy feel of a rural community within a thoroughly urban setting." In "Vernacular Architecture and Society," *Vernacular Architecture: Ethnoscapes: Vol . 4* , Mete Turan, ed., p. 283.

shredded wheat in about eight years."[13] Porches tended to disappear or to be completely rebuilt and restyled every generation.[14]

Or they gradually became part of the house interior. First came screens, against the bugs. Then came glass, against the chill. Then came insulated walls, against the winter. And then the spindly piers gave out and had to be replaced with a real foundation. Each stage proposed the next, driven inexorably by climate. Open porches still thrive south of the Mason-Dixon line, but they are absorbed into the house everywhere north—fantasy surrendering to reality. The social climate also changed. The street became loud with cars and trucks, and passers-by diminished. Inside, air conditioning and television beckoned. The porch was functionally obsolete by the 1960s.

In its place came the deck, this time facing the back yard. A classic do-it-yourself project (a book titled *Decks* has sold 2 million copies since 1963), the deck turned out to be just as ephemeral as the porch. Rain and sun rotted even pressure-treated lumber. When atmospheric ozone depletion made people afraid of exposure to ultra-violet rays, the whole suntan rationale of the deck vanished. A revival of the covered porch seems assured.

A different sequence happened with the garage. How did it come to pass that most garages have everything *but* cars in them? Originally hidden behind the house in the backyard, garages migrated to dominate the front, swallowing half the facade of suburban ranch houses and their descendants. From occupying 15 percent of a home's enclosed space in 1930, they grew to enclose 45 percent by 1960.[15] Ostensibly this reflected the coming of multi-car families, but even more it was the covert correction of another Modernist mistake. Modern-house doctrine of the 1940s stated:

> Man's space needs within the home have...been reduced to a fraction of their former proportions, with the resultant elimination of attics, sheds, storage cellars, work rooms, sewing rooms and laundry. Public provision of libraries, schooling, music, and recreation causes still further reduction of space needs for many homes. Easy access to shops reduces the size of storage space—closets, pantries—and kitchens.[16]

Easy access to shops, far from reducing material in the house, crammed the house with new stuff. The trend started by bungalows of having no cellar or attic continued with ranch houses, but the need for storage kept ballooning, and eventually all the spare stuff wound up in the garage, pushing the car back out on the street—which it didn't mind, being more weatherproof than the house anyway. (Heaped boxes also filled many a glassed-in back porch.) Along with the off-season sports equipment, Christmas decorations, and memory-filled clothing and bric-a-brac, the garage inherited the activities that used to grow into basements and attics—backup refrigerator, washer/dryer, kids' room, hobbyist bench, male retreat, spare bedroom (eventually provided with a kitchenette and outside door and rented out). The only garages still used for cars are where street parking is impossible or forbidden.

The pattern is clear. When the family looks around for some place to expand, which it always does, the easiest, cheapest, and quietest direction (no building inspectors, please) is into existing "raw" space whose initial function is deemed dispensable—the porch and the garage. Maybe it's time to bring back the attic.

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13 Scott McBride, "Railing Against the Elements," *Fine Homebuilding* (Nov. 1991), p. 68.

14 "The most common means of updating the appearance of a house is to add, remove, or alter a porch." Virginia and Lee McAlester, *A Field Guide to American Houses* (New York: Knopf, 1984), p. 14. See Recommended Bibliography.

15 Title above, p. 31.

16 James and Katherine Morrow Ford, *The Modern House in America* (retitled *Classic Modern Homes of the Thirties*), (New York: Dover, 1940, 1989), p. 10.

17 K. C. Leong, *San Francisco Examiner* (21 April 1991), p. F11.

18 Lorrie M. Anders, *San Francisco Examiner* (7 June 1992), p. F11.

Houses evidently need more low-definition space for later expansion, and it's easier to add in than add on.

In or out, remodeling a home is a royal pain. Whether you move away during the work or try to share the house with the workers, everything is in a maddening uproar. It's horrifying to see your secure world dismembered—rip, bang, and a whole wall of your life is gone, strewing disconcerting entrails of wire. Dust and mess invade the rest of the house. Life becomes endless negotiation—with the contractor, the workers, and among family members. Some of the new ideas don't satisfy, and each change forces other changes.

It is for this reason, says remodeling contractor Jamie Wolf, that 87 percent of remodeling work comes by personal referral. "It's about trust," he explains. "You're in their *home* for six weeks to six months." When the process goes bad, it can be life-warping. One family near San Francisco had a second-story addition drag on beyond two years, so they called around to other customers of the lethargic contractor. "We were all so exasperated that we formed an ad hoc support group, visiting one another's unfinished homes and sharing spine-tingling horror stories only remodeling veterans can appreciate."[17] A professional mediator in Berkeley reported that one of his clients "burst a blood vessel in her eyes just talking about her contractor."[18]

The ordeal of major remodeling makes many people opt for continuous amateur adjustment instead, which has its own problems. Many a remodeling contractor has to announce grimly higher costs upon discovering the product of previous do-it-yourselfers—dangerously inept wiring, nowhere-near-code plumbing, sloppily installed windows and doors. All that work has to be redone along with the new work in order to get by a building inspection.

Even professional remodeling takes a toll on a building when repeated often enough. San Francisco plumber Rufus Laggren comments wryly, "I've seen some beautiful buildings in Pacific Heights that turned out to have 'learned' so much from the last three remodels that the bathroom was about to fall into the living room, because so little was left of the structure after all those grand changes had been cut in. Folks move bathroom fixtures around, which means moving pipes around, which means drilling or notching more holes in the floor joists. Each time a toilet moves, a 3-1/2-inch pipe needs to follow it. Since the folks on the hills have more money to express themselves with remodeling, one usually finds this sort of problem in the best neighborhoods." It's a good example of the destructive power of money and of the way differently paced parts of a building can tear at each other.

Most painful of all is when the expensive improvement turns out to be worse than what it replaced. In recent decades many older houses in the American south that used to be up on wood or masonry stilts were decreed by their owners to look "poor" that way, so the open sides were boarded in. This cut off ventilation—the original reason for the stilts, forgotten when the local vernacular pattern language died—and termites and rot quickly brought the buildings down. Another frequent error is installing built-in furniture. It works beautifully when the goal is to save space, as in bungalows, but it petrifies rooms around one ephemeral function. Soon enough you have to demolish the walls to move the furniture.

The trick is to remodel in such a way as to make later remodeling unnecessary or at least easy. Keep furniture mobile. Keep wiring, plumbing, and ducts accessible. Because at some point sooner than you imagine your present arrangement will become suddenly and profoundly intolerable, and you will not be able to rest until you have a Corian island in your kitchen, or a walk-in closet, or a fireplace in the bedroom, or another bathroom, or a skylight over the stairs, or an electronic home theater, or a private study isolated from the noise of the home theater, or whatever it is.

"Every house is a work in progress," writes David Owen:

> It begins in the imaginations of the people who build it and is gradually transformed, for better and for worse, by the people who occupy it down through the years, decades,

> centuries. To tinker with a house is to commune with the people who have lived in it before and to leave messages for those who will live in it later. Every house is a living museum of habitation, and a monument to all the lives and aspirations that have flickered within it.[19]

Looking at the life of houses foreshortened in time like this, do any generalizations emerge? One might be: the improvements and corrections that people make have little to do with style and everything to do with amenities. Even fantasy items like a home workout room may reflect a fad, but they are not fashion statements. When homes are reclad with fake clapboard, fake stone, and the like, it's an apparent style change, but the main event is getting a lower-maintenance skin on the place. Low maintenance is an amenity. A garden, a bigger kitchen, another upstairs room: all these improve livability, not stylistic coherence.

Far the greatest rate of change comes right at the beginning, as it does with everything that lives. It starts before the building is even complete. People building a house—or any building—always complain that "finishing is *never* finished." There are several reasons for that. You're down to detail, and details are endless. Also you're down to where the building most interfaces with the people who will be living in it, and they discover that some important things were left out, and some ideas that seemed so sensible on the plans aren't going to work. Last-minute revision—the most important stage of tuning a house—comes just when time and money are shortest. Aggravated compromise is the order of the day.

Finally the work crew goes away and the occupants move in. Inhabitation is a highly dynamic process, little studied. There's a term floating around the fringes of biology that applies—"ecopoiesis": the process of a system making a home for itself.[20] The building and its occupants *jointly* are the new system. The dwelling and the dwellers must shape and reshape themselves to each other until there's some kind of tolerable fit. It takes time and money that are seldom budgeted for. A building can be stillborn if it is too thoroughly finished and fitted out and isn't given a chance to respond to the life moving into it.

Interestingly, a whole new ecopoiesis process has to be gone through each time there are new occupants. David Owen describes it perfectly in his house-fixing book, *The Walls Around Us*:

> I now believe that when a new family moves into a house, the house suffers something like a nervous breakdown. A few days after the deal is closed, water begins to drip from the chandelier in the dining room, a heating pipe bursts, and the oven stops working. The house is accustomed to being handled in certain ways. Then, suddenly, strangers barge in. They take longer showers, flush the toilets more forcefully, turn on the trash compactor with the right hand instead of the left, and open windows at night. Familiar domestic rhythms are destroyed. While the house struggles to adjust, many expensive items—including, perhaps, the furnace—unexpectedly self-destruct. Then, gradually, new rhythms are established, the house resigns itself to the change of ownership, and a normal pace of deterioration is restored.[21]

A building is an organizational device, which means it is a communication device, which means that a certain volatility is always carving away at the physical building, making sure that whoever cooks the meals can chat with the family while cooking

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19 David Owen, *The Walls Around Us* (New York: Random House, 1991), p. 5. See Recommended Bibliography.

20 The word comes from Robert Haynes of Toronto, who applied it to planting life on Mars. "Eco" is "home"; "poiesis" is "making." Pronounced "EEK-o-poy-EE-sis."

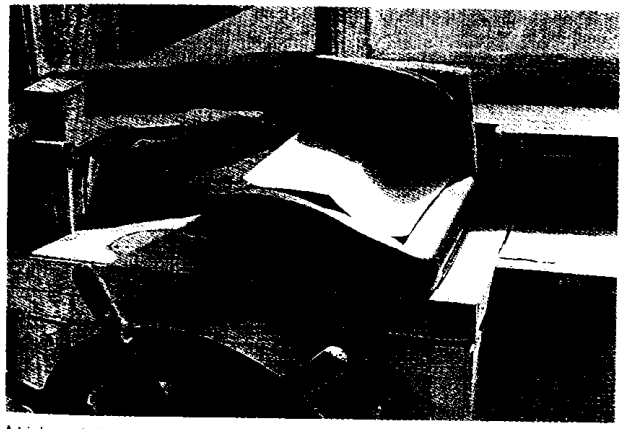
21 David Owen, Title above, p. 7.

22 The word combines "satisfy" and "suffice". It was coined in 1956 by the distinguished systems theorist Herbert Simon: "Evidently organisms adapt well enough to 'satisfice'; they do not, in general, 'optimize.'" In 1958 he wrote, "To optimize requires processes several orders of magnitude more complex than those required to satisfice." *Oxford English Dictionary.*

(kitchen walls melt) or that the boss can be alone on the telephone (cubicle walls suddenly rise to the ceiling). Teenagers isolate themselves, accounting departments drift to the periphery—both to get away from the hourly crises of action central. Often information itself is a cheaper fix than physical correction. In the brand-new Music Building at the University of Michigan on a pair of double doors underneath a glowing (legally required) "Exit" sign is a hand-lettered warning, "NOT an exit!!!"

The countermanding sign is an example of the way most problems are handled in buildings once they're occupied. The solutions are inelegant, incomplete, impermanent, inexpensive, just barely good enough to work. The technical term for it, which arose from decision theory a few decades back, is "satisficing."[22] It is precisely how evolution and adaptation operate in nature.

SATISFICING doesn't try to solve problems. It reduces them just enough.



All three photos © October 1993 Brand.

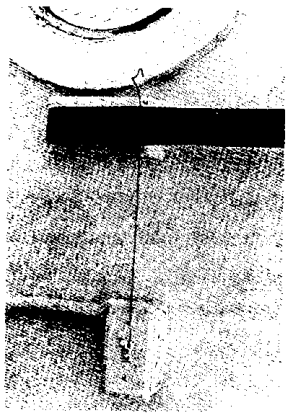
A triple satisficing is visible around the fax machine in my office (a derelict fishing boat). 1) To make a horizontal space big enough for it next to the old steering wheel, I hacked some of the ledge away with a saber saw. 2) But then sunlight from the south-facing window cooked the fax and made its display go dark, so I shaded it with the manual and a piece of paper. 3) When I opened the cabin doors for ventilation on hot days, wind would blow the paper away, so I weighted it with a lead-shot-and-leather paperweight that was sitting around. Zero expense, zero waste of time, scant investment in an evanescent piece of technology, but a highly customized and convenient workspace.

Even after generations of satisficing, the result is never optimal or final, though it can be, like the random-feeling street lights of Venice, sublime. The advantage of ad hoc, make-do solutions is that they are such a modest investment, they make it easy to improve further or to tweak back a bit. This dynamic, of course, is what makes so many "temporary" buildings become permanent. Being conspicuously and cheaply adjustable, they can wrap around any use demanded of them.

"Convenience defines what gets done," observes software entrepreneur John Pearce. I might add that it defines how things gets done. Porches and garages weren't designed for growing into. Families satisficed their way in, fixing one minor problem after another with the most convenient good-enough solutions.

Another advantage of satisficing is that it's usually done by the

An incurable deck leak in the tugboat-houseboat where my wife and I live was making the the kitchen unpleasant in the winter, because rainwater was collecting and dripping off a rusty carriage bolt in a deck beam and staining the back of the kitchen table bench. After two years of fighting it, we surrendered: a copper funnel under the bolt (right) collected the drip and conveyed it by copper tube to the outside. It looks rather elegant. End of problem.



When a carpenter friend replaced the rotted booby hatch on our tugboat, he inadvertently put the light switch too low, where one's hand grasping the rail (right) could no longer conveniently thumb the switch on one's way into the dark hold. "Fix it," we groaned. He did, very economically, with a piece of stiff wire.

occupants. Along with the efficient directness, you get a correct level of responsibility-taking. When local building adjustments are made by the local occupants, they "own" the improved space. The opposite happens when the occupants have to go through labyrinthine channels to get permission to make a change, and outside professionals are hired. Then the problem gets translated into one of interior design.

Interior designers never satisfice. They are paid to optimize, to make perfect. "All redecorations seem, when new, to be perfect and permanent solutions," warns interiors historian William Seale.[23] Perfection is frustratingly temporary always, but especially so in building interiors, where traffic is constantly buffeting the Space plan and Stuff.

In vernacular traditions, the inside and outside of a building were treated as one, but in the academic tradition they have been separated ever since the Renaissance, when sculptors specialized in the shape and exterior of grand buildings, and painters decorated the interiors. Over the last 100 years "upholsterers" and "drapers" became "interior decorators" and then, influenced by industrial design after the 1950s, "interior designers." They have been classic paraprofessionals, getting more work and often having more fun than many a licensed architect. The ones who focus on function—such as space planning for offices—have been largely a boon, but the ones who focus primarily on "look" have borrowed the artistic preciousness of academic architecture and made it even more restrictive by pressing it right around the people trying to use a building. Style cramps life, and life erodes style. All too soon the unified look is polluted by use, and it's time to hire someone to supply another alien unity.

Talking with William Seale, a professional consultant on historical interiors, I was surprised by the ferocity of his opinion of stylistic interior designers: "How many interior designers are trained? Very very few. They're merchandisers, and that's why architects claim they are not professionals. Most designers have something to sell, and they charge a percentage of it, and of course many take kickbacks besides that. Many of the auction houses offer kickbacks running between 15 and 35 percent. They make a lot more money than architects. Their overhead is almost nothing." He added, "I think it's the most inconceivably boring business I could ever imagine, doing up people's houses."

It's also estranging for the clients to wind up dwelling in someone else's style package. Deborah Devonshire and her husband contemplated the issue when they were getting ready to move into the treasure house of Chatsworth:

> When I was young I watched my mother doing up whatever house we were living in and making it far prettier on far less money than those of friends who employed professionals to do the job, and I felt that I could probably do as she did, and so, for two reasons, we decided against employing a decorator. The first was that I cannot imagine living among someone else's taste, and the second that I cannot see the point of paying someone to do something I can do myself.[24]

Chatsworth feels more alive than many great houses because it embodies the intelligence and life history of the family living in it. One of the reasons visitors go back year after year is that even the most public and historic rooms are always somewhat different, reflecting the Duchess's evolving ideas.

And the private rooms? She writes of her sitting room with its out-of-fashion white paint and its Samuel Palmer watercolor (she thought the original was overpriced, and framed an illustration from the catalogue instead):

> Being in this room on a winter night, alone or with one or two great friends, the sparkling coal fire with its low brass-bound nursery fender, the familiar things all around, sitting in a chair which becomes a nest with letters and papers and baskets and telephone scattered on the floor, dogs comfortably settled by the fire, or near the draught of the door according to their thickness of coat, is my idea of an evening happily spent.[25]

The distribution of the dogs, and her perception of them, signal a room thoroughly grown into. Professional designers have borrowed all manner of Chatsworth fabric patterns and historical references and design inspiration, but they will never get the dog part right.

As Ivan Illich suggested, habitation and habit come from one word—Latin *habere*, to have. We shape our buildings around our routines, loving the fit when it becomes intimate and sure, and cleaving to it as conservatively as a duchess in her sitting room. Paradoxically, habit is both the product of learning and the escape from learning. We learn in order not to learn. Habit is efficient; learning is messy and wasteful. Learning that doesn't produce habit is a waste of time. Habit that does not resist learning is failing in its function of continuity and efficiency. Buildings keep being changed until they get to a point where they don't have to be changed so much.

Human learning has been distinguished into three fundamental levels, the first of which in fact serves habit. The keepers of a routine like to endlessly refine its detail, tweaking the environment to serve it ever more precisely. Far from threatening the routine, this kind of incremental refinement enshrines it always further. Organizational learning theorists such as Gregory Bateson and Chris Argyris refer to it as "single-loop learning"—like a thermostat turning the heater on and off to keep the room at a set comfort level. The learning is "single-loop" because it responds to a simple feedback loop: keep the room near 67 degrees Fahrenheit; keep the sitting room a restorative refuge for the duchess; keep the bathroom clean and cleanable.

The kind of learning that threatens habit is up a level--"double-loop learning." Instead of minor adjustments, major readjustments are called for. The thermostat is reset to a different temperature entirely. This is the second, higher, loop of feedback, declaring that the existing habit, no matter how perfectly refined, no longer serves the larger purpose. Sorry, Duchess, but the sitting room has to become a bedroom for the grandchild who is visiting more often now. Do you suppose you and the dogs could move to that nice corner room with the view toward the hills? Sorry, accounting department, you've outgrown the electrical capacity of this part of the building. We've got to recable, and how would you feel about a raised floor so the next change will be easier?

A third level of learning is "learning to learn." Raised floor is one example. This book is another. While single-loop refines habit, and double-loop changes habits, learning-to-learn changes how we change habits. An organization that fires the janitor and hires a facilities manager is taking a new relationship to change in the building, effectively shifting from a stasis manager to a change manager.

"Change is suffering" was the insight that founded Buddhism. We hate change. Ever since the big easy chair was reupholstered it's not as comfortable any more. And we love change. "Let's just *re-do* the kitchen!" To change is to lose identity; yet to change is to be alive. Buildings partially resolve the paradox by offering the hierarchy of pace—you can fiddle with the Stuff and Space plan all you want while the Structure and Site remain solid and reliable.

The best place to study buildings learning to take change as a constant—"learning to learn"—is where people do office work. Frank Duffy has remarked on the absence of long-view research in this area: "One of the most dominant facts of 20th century life is the huge increase in the importance of the office. We've had a massive change from less than 10 percent to over 50 percent of people occupied in offices, and no one has studied the physical evidence of that change from an organizational and social perspective." Particularly worth examining is the history of the

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[23] William Seale, *The President's House* (New York: Abrams, 1986), vol. II, p. 1056. See Recommended Bibliography.

[24] Deborah Devonshire, *The House* (London: Macmillan, 1982), p. 79.

[25] Title above, p. 107.

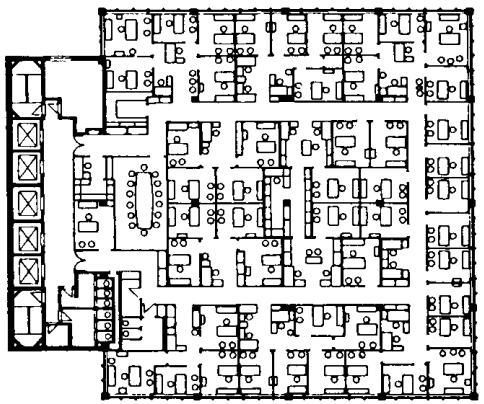
"open office," an innovation that swept the world in a decade.

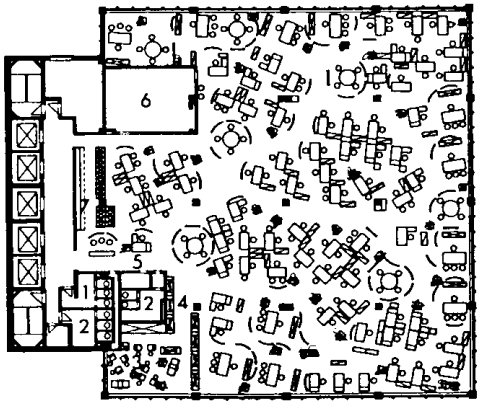
Few people realize that the open office—the scattering of desks and work groups around huge open floors—was a deliberate invention by a couple of professionals. Working near Hamburg, Germany, in 1958, the brothers Eberhard and Wolfgang Schnelle were neither architects nor planning consultants: they were organizational designers. And organizations, in their view, were severely restricted by tiny offices strung along lengthy corridors. Communication was poor, flexibility was nearly impossible, and the wrong-size groups were always stuck in the wrong-size spaces. So they threw away the walls and straight lines and created what was called *Bürolandschaft*—"office landscape"—later Americanized to "open office." It's hard to imagine now the shock and horror felt by orderly business people and architects when the idea first began to spread via magazine articles in the early 1960s. It looked like chaos, anarchy.

A second wave of innovation, in office furniture, completed the revolution. Robert Propst was known as an inventor of such devices as heart valves and timber harvesters when he was hired by the furniture firm of Herman Miller in 1960. By 1964 he was introducing ingeniously modular new work furniture, and in 1968 he wrote a revolutionary tract, *The Office: A Facility Based on Change*. Employing easily movable partitions and easily linked and delinked work surfaces and storage devices, the new furniture worked best in an open office environment. As advertised, it was relatively easy to move around and reconfigure for new jobs and new work groups. Form at last was following function.[26]

Furniture companies like Herman Miller and Steelcase prospered. "What's happened in the last twenty years is a massive migration of problem-solving from architecture into office furniture," observes Frank Duffy. "Things like dealing with storage, dealing with acoustics, with lighting, with partitioning, with cables have been taken away from architects." What used to be semipermanent Space plan material had turned into mobile Stuff. The driving force for all this malleability is what is called "churn rate"—the percentage of an office's population that changes location in a year. In most offices these days, churn ranges from 30 to as high as 70 percent—seven out of ten people physically moving within the organization every twelve months. As office work becomes ever less role-based and ever more project-based, the pace of shifting around work teams and players keeps increasing.

The final element making office environments forever liquid was the arrival of information technology. Office managers gradually realized that the computer equipment was going to keep needing





Floor plans from John Pile, *Open Office Planning* (New York: Watson-Guptil, 1978), p. 28.

1967 - THE NEW OPEN OFFICE (right) was tested by DuPont in a comparison study with the company's standard cubicle office layout (left) in an office building in Wilmington, Delaware. The German team that had invented the form consulted on the project. Though it inspired many other companies to adopt open office space plans, the test did not persuade DuPont. Managers complained they did not have enough privacy, and no great improvement in costs or flexibility was detected. The movement took off anyway.

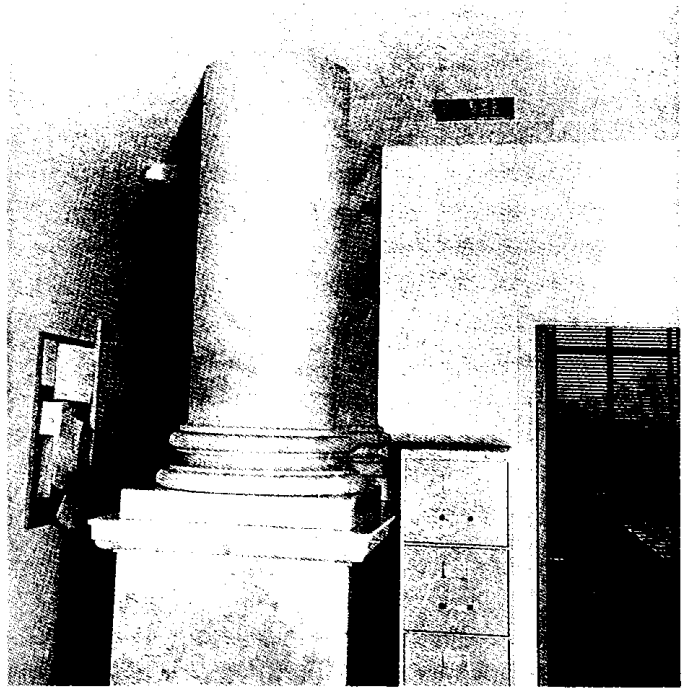
replacement, demanding major reshaping of work areas, every three years or so. Information equipment kept taking up more space and electricity, meanwhile displacing middle management, annihilating low-skill jobs, and increasing the use of specialists and technicians. "It's such a restless, remorseless, destructive technology," says Duffy, "it accelerates and destabilizes the whole process." It was the arrival of the permanent earthquake of information technology that pushed most organizations into hiring facilities managers, many of whom began as computer and communication-system techs.

At first, dropped ceilings took care of the growing traffic in communications wires. Recabling those wires could be handled by "poking through" the concrete floor plate into the ceiling space below, but that was soon found to be too expensive to change constantly, and so the raised floor once exclusive to mainframe computer rooms began to invade entire office buildings. At any churn rate above 30 percent, said the rule of thumb, raised floor became economical; it would pay for itself in two complete churns.

What is seldom noticed is that raised floor invites recabling *by the office users*, while dropped ceiling punishes it. The deeper the floor space, the better. In one intensely used computer-research room at MIT's Media Lab, I remember some students lifting floor tiles and diving bodily into the 20-inch floor space as often as three times a week to restring cable between work stations. Ceiling tiles, however, are an invitation to disaster. A typical account:

> There I was, standing on an old chair, sweating and cursing the moment I ever had the bright idea of stringing 100 feet of 4-conductor telephone wire from one end of my office to the other by running it through the dropped ceiling. I had

[26] The history of the open office is traced in John Pile, *Open Office Planning* (New York: Watson-Guptil, 1978), pp. 18-36.



Library of Congress. Neg. no. 19075 PG-5486C.

1969 - DROPPED CEILING and acoustical tile defaced the Great Hall of the Library of Congress's original Jefferson Building (1897) when temporary offices took over the space. One panel of ceiling tile appears to have broken and fallen out in customary fashion. This photo was used to lobby Congress to approve a third building for the Library.

forgotten about the lowly acoustical tile. This ubiquitous stuff, hanging over the heads of millions of American innocents who must be sheltered from the grim and boring reality of the building systems in their offices—heating ducts, BX cable, light fixtures, cable trays, and other effluvia—is crumbly, easy to break, difficult to cut and maneuver, and in general qualifies as a Building Material From Hell.

Pretty soon I felt it was going OK, although the stuff from the tiles was getting in my eyes and hair and all over the floor. I was taking it slow and easy—lift up a corner, push a little bit on the next corner, pop it up, sling the wire, run it along—

> and then I ran into a veritable snakepit of cable bundles, light fixtures, and ducts, and one duct was flush with the center of the acoustical panel. I pushed too hard and, *fwuuuup*, the fucker cracked but good. A diagonal chunk about eight inches long popped off and disappeared into the drop ceiling. I couldn't get the rest of the panel to budge. I did the same thing to another nearby panel before giving up, sweaty and disgusted and dripping with acoustical panel drizzle. How did such awful stuff ever get to be standard in the construction, design and remodeling industries?[27]

It got to be standard because it was designed by professionals for professionals and assumed no incremental change and no handling by building dwellers. Liftable floor tiles also were designed by professionals, but incremental change by users was assumed. Ceiling tiles are anti-vernacular, floor tiles mildly pro-.

With the takeoff of the "information economy" in the 1970s and 1980s, new office buildings surpassed even malls in the real-estate boom. You would expect new commercial buildings to learn rapidly from all the changes going on with office use, and unfortunately they did. They overadapted to transient ideas, and colossal mistakes were made.

Highrise developers and designers were quick to welcome the idea of the open office. They soon discovered that open offices yielded a higher density of workers, hence higher space "efficiency" and higher rents. And all that openness permitted buildings to be much "deeper"—distances could be as great as 60 feet from the center of a floor out to the windowed edge of the building, again translating into higher efficiency.[28] Since floors were mostly all one space, lighting and heating/ventilating were greatly simplified. Just put in a fluorescent light every so many feet and a vent every so many feet and you were done. Hang a curtain wall of glass on the outside of your tall, fat box, and take a bow. (And hire some psychiatric specialists in the human-resources group to counsel employees suffering depression from loss of privacy and being cut off from daylight and weather.)

In 1973—the first energy crisis—all that exterior glass suddenly turned from a source of pride into an expensive problem. On sunny days too much sunlight was getting in, overloading the air conditioning, and too much heat was getting out the rest of the time, overloading the furnaces. So new office buildings were sealed tight, with tinted windows double- and triple-glazed, and tighter control was enforced by building management over lighting and air temperature. Money was saved, public credit was taken for energy conservation, and people became seriously ill from being sealed in with harmful chemicals outgassing from the carpeting and building materials, plus occasional pathogens breeding in the constantly recycled air conditioning. A new term entered the vocabulary: "sick building syndrome."

When information technology took off in the early 1980s, many of the highrise office buildings of the previous two decades were found to be absolutely incapable of adapting. Their floor-to-ceiling height was too low. There was no room for both a dropped ceiling and a raised floor, and no way to fix the problem. Blocks of new buildings in London's data-intense financial district were suddenly obsolete, and since the problem was Structural the only cure was demolition.

Some of the buildings that replaced them erred in the opposite direction. The "smart building" boomlet of the early 1980s was based on the idea of electronically integrating all the control systems of a building *and* offering tenants a full menu of built-in information services. Both failed. Climate control, fire suppression, security, lighting, and communications—all were

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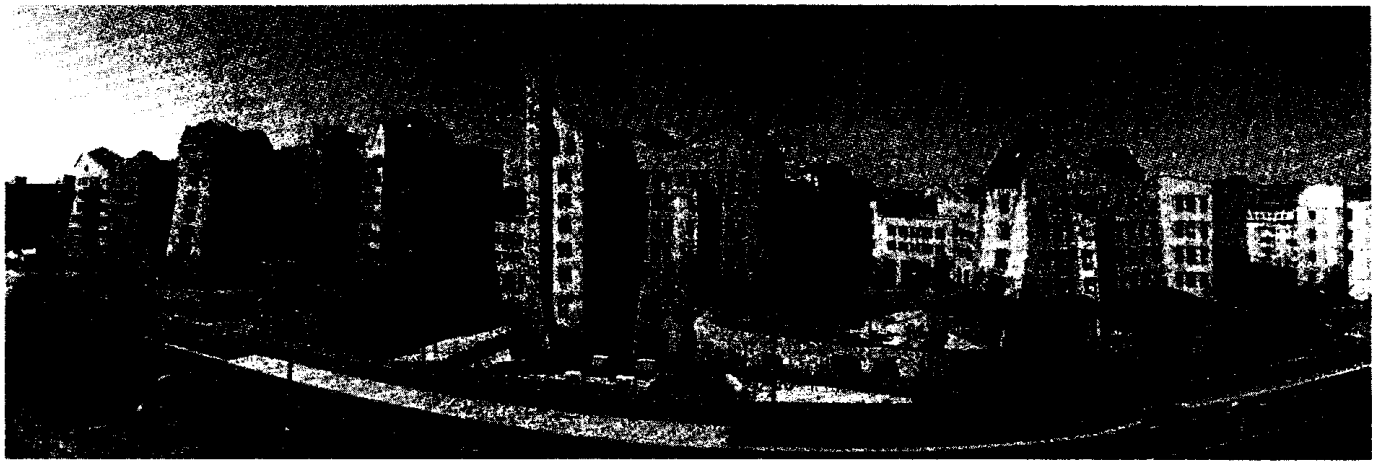
[27] Fred Heutte, in a June 1990 comment on The WELL.

[28] The gain was usually interpreted in terms of higher "net-to-gross ratio"—more rentable worker area per area necessarily dedicated to corridors, elevators, stairs, bathrooms, etc. Gross is the amount of square feet you have to build. Net is the fraction you can charge rent for. Efficiency of 90 percent is considered by landlords to be desirable, by occupants to be almost unbearable—galley-slave conditions.



From company brochure, *NMB Bank's Head Office.*

1988 - THE NMB BANK building (1987) in Amsterdam epitomizes the new trend in Northern European office buildings. Instead of one highrise core, it has fourteen low-rise cores joined by a spectacular interior pedestrian "street." Stairs predominate over elevators. Everyone in the building is within twenty feet of a window, all of which can be opened. There is little overhead lighting and no central air conditioning. The building includes Japanese roof gardens, four restaurants, and a snack bar for its 2,500 people.

supposed to be managed by a bank of computers tracking on time of day, day of week, who was in the building, and detailed sensing from all over the building. Integrating all the complexity in one bundle meant that only a specialist could understand or handle the system, and a problem in one area could infect the others. Seeking to improve control led to loss of control. One night at the headquarters of Bechtel, the world's largest construction firm, a group of senior executives met in the dark because none of them knew the phone code to turn on the lights.

Since all those pre-installed information services cost the developer about $2 a square foot extra, higher rents were charged. It turned out that no one wanted to pay extra, and "smart buildings" died in the market in just a few years. There was a contradiction at the heart of the idea, according to Steve McLellan, a telecommunications regulator in Washington state: "We found that any user sophisticated enough to seek out a 'smart' building was also sophisticated enough to home-brew a more flexible system." Tenants universally preferred to install their own communication systems.

What do the linked debacles of deep office buildings, sealed office buildings, and "smart" office buildings have in common? Each was a clever and comprehensive design solution, but each tried to solve just one primary problem and acted as if the problem would hold still over time. These were classic cases of overspecificity, overcentralized control, and "tight fit." Each took a conspicuous trend of the moment—open offices in the 1960s, energy efficiency in the 1970s, information technology in the 1980s—and, at astronomical cost, shaped whole buildings tightly around it. When the trends moved on, the buildings were left standing, good at something that no one wanted any more. Their failure is the failure of optimization as a design strategy.

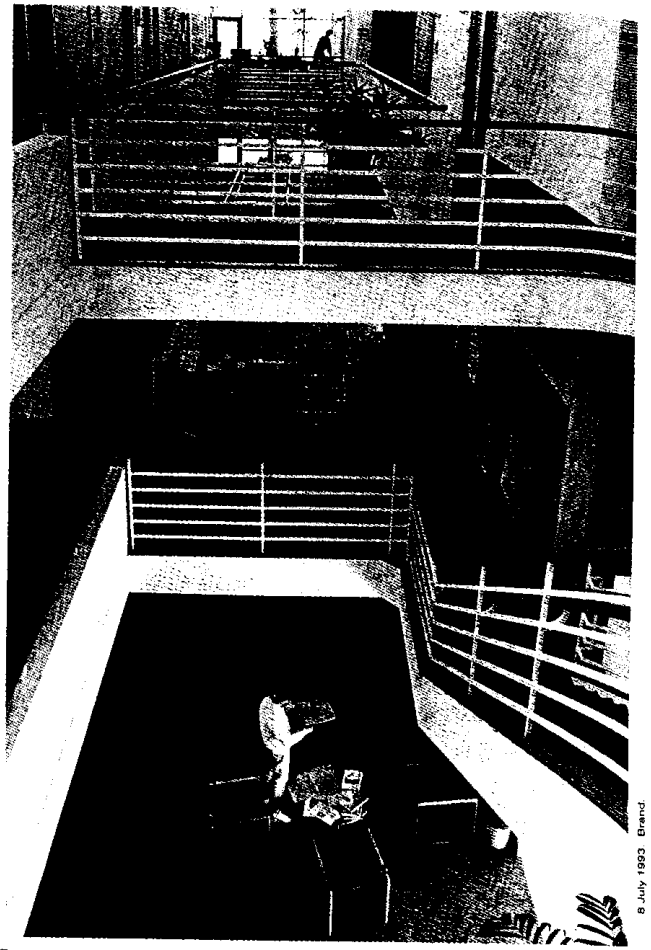
Revolution by the oppressed workers was predictable. Frank Duffy has the story of what happened to new office buildings during the 1980s in Scandinavia, Holland, and Germany, where open offices began. "Those big decisions made by architects and managers were superseded by *real* industrial democracy through the institution of workers' councils, which are critical in northern Europe. An employer has to consult the employees before he proposes a change in their qualitative work life such as a new building. And guess what they don't like? They don't like open plan. And guess what they do like? They like windows that they can open, and doors they can shut, and walls they can bang on. The new northern European buildings, instead of being 120 feet deep, are 30 feet deep. They're like hotels—millions of individual rooms, each with a window." The buildings typically are only five stories high, with lots of public circulation (70 percent "efficient").

The best of them, such as Ton Alberts's NMB building (1987) in Amsterdam, are well-loved.

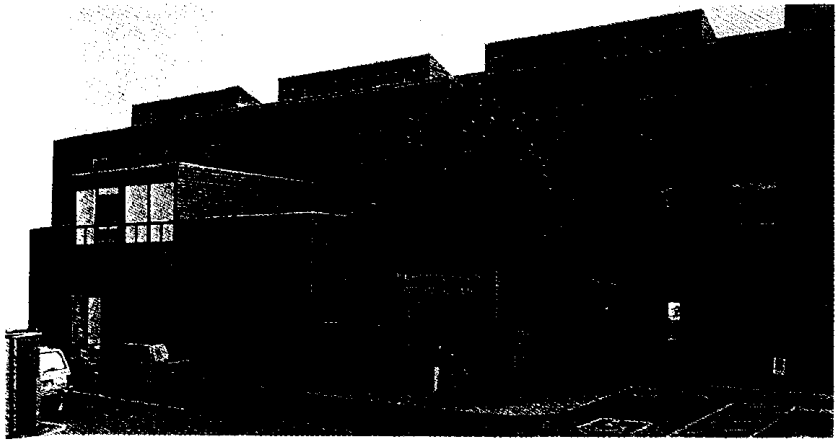
This change-back phenomenon is one I've observed so often in buildings that I suspect it approaches a law. Several dynamics seem to be at work. Change is often followed by reversal of the change, because the prior pattern lingers as the most conspicuous alternative, because people are understandably conservative about their physical space, and because most change is really undertaken as a trial, no matter what people say at the time. And most trials are errors. My photographic study of office furniture over time (in the Appendix, pp. 216-217) suggests that the most likely place for a piece of furniture to move after it has moved once is back to where it was before.

The best adaptation I've seen of the open-office idea is a partial retreat from it. People crave acoustic privacy so they can talk on the telephone, but visual privacy is not as important—they like being able to see what's going on. This has led to a very satisfactory compromise called "cave and commons." Each office worker has a private office, often small, which opens into a generous open area surrounded by many other private offices. The open area has a kitchen, some couches, sometimes tables for sitting around informally, and sometimes a working library, or at least a rack of current periodicals. You can shut the door of your cave and concentrate, or you can leave your door open and keep an eye and ear on who's coming and going in the commons, and whether the meeting or presentation going on there might be worth leaning in on. The feeling is congenial and homey, and it encourages the casual encounters which, research keeps showing, are at the heart of creativity in offices.

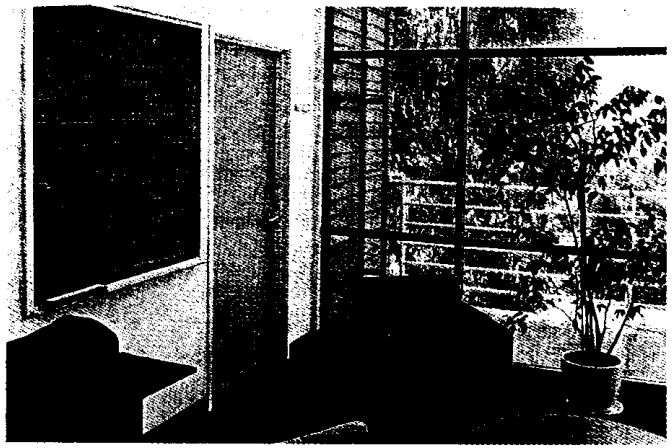
An extreme case of cave-and-commons is an extreme success. This is the Mathematical Sciences Research Institute (1985) at the University of California, Berkeley, designed by William Glass. A modest three-story wood building, its whole inside is one continuous atrium with just a rind of fifty-six small offices. These ascetic, contemplative caves for the visiting mathematicians all open directly onto the exposed walkways and stairways of the atrium. At the ends of every floor are comfy hang-out areas with couches and blackboards and a pleasant view. The mathematicians can't help encountering each other constantly, and there's the further mix of high tea every afternoon at 3:15 down on the



1993 - THE ATRIUM of Berkeley's Mathematical Sciences Research Institute (1985) makes the building one connected whole. Every one of the 56 offices opens directly into the commons area, and crosswalks and stairs link them conveniently. The clink and chatter of daily afternoon tea drifts enticely up from the floor of the atrium. But the building has become burdened by success. The programs have grown so much that all the offices designed for occupation by individual visiting mathematicians have been forced to double up, and the roommates disturb each other's concentration with phone calls, visitors, and chat—to the point that many now work at home, destroying the whole interactive purpose and glory of the building. A new wing is planned to add 30 new offices, a large commons room, a larger library, a cafeteria, an auditorium, and half a dozen small seminar rooms (sorely needed).



1993 - Deliberately designed to feel informal and non-institutional, MSRI's wood frame building with cedar siding is inexpensive and unpretentious. Architect William Glass avoided the temptation to do something geometrically or topologically cute and delivered a straightforward, serviceable building. His firm was rehired to design the new wing, which will expand to the left.



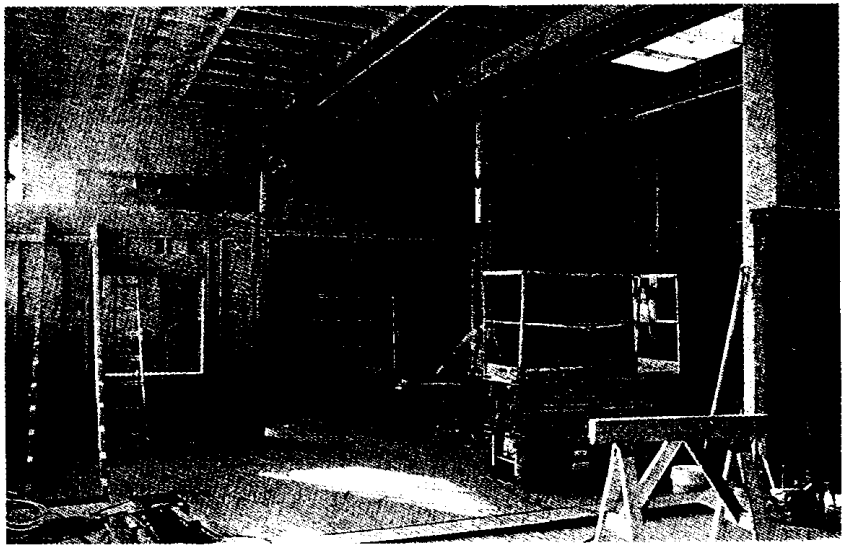
1993 - Well-used blackboards as well as pleasant views in the mini-lounges at each end of every floor encourage the mathematicians to convert chance encounters into searching discussions. In "cave-and-commons" offices, both privacy and easy access to other people are treated as crucial amenities.

floor of the atrium next to the library. Alumni of the building report that "Mathematics comes alive when people talk to each other." They hate to leave at the end of their terms, because their home universities have nothing like the building's collegiality.

Office buildings are organizational hardware, and since many organizations are redefining themselves these days as "learning organizations," the design question is: how can buildings aid organizational learning? One answer may well be: by aiding local adaptivity. Small groups adapt more quickly and accurately than large groups, and individuals are even quicker than that. Smart organizations, therefore, push control of space as far "down" the organization as they can. It starts with the kind of space that is leased. Rather than moving into offices already fitted out by some spec developer, adaptive organizations prefer either raw space in an old building or raw space in a new building. There it's called "shell and core"—only the exterior walls and the core of elevators, bathrooms, service chases, etc. are finished. The tenant takes active control of the space by filling in all the rest.

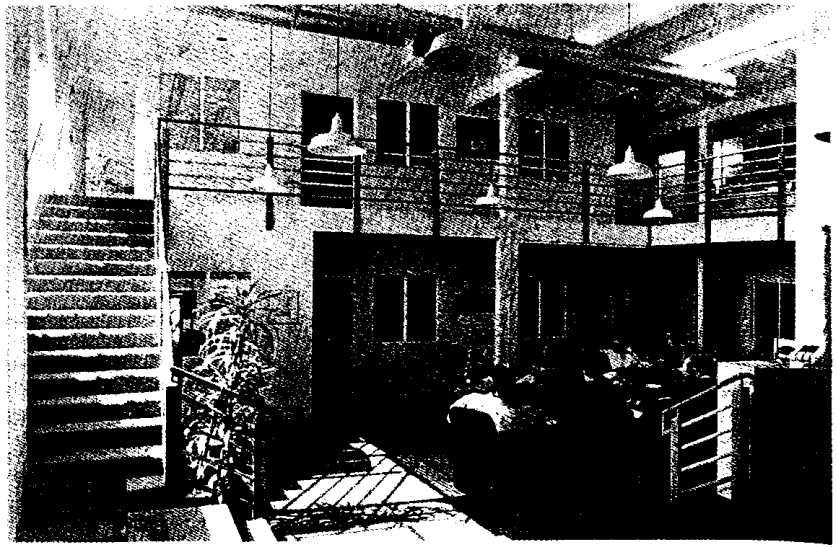
Once in place, the organization advances best by hordes of "small wins" in space adaptation rather than huge sweeping solutions that are two years out of date by the time they're finally agreed on and implemented. Chris Alexander and his students, in an unpublished 1990 work on "Office Patterns," define the physical spaces of an organization as a nested hierarchy of realms—individual, within workgroup, within department, within whole workforce, within the larger community:

> At each level of scale, it is those actually using the space who understand best how it can made/altered to have the character of being conducive to the work, and this group should be given sole control over that space both in the physical definition of the territory (including Realm Center and Realm Boundary) and by giving the group power over placement of furniture, purchase of needed items, decorations, etc. Thus an individual has control over his/her own workspace; the workgroup has control over the group working area but not over the individual workspaces; the department has control over its space but not over the workgroup spaces, and so on.
>
> Therefore we suggest using materials and structural systems which invite change and allow changes to accumulate,



2 December 1991. Brand.

1991 - The building at 5900 Hollis Street in Emeryville, California, was originally (1930s) a factory for International Harvester tractors. The space we moved into had more recently been a dance studio, then a school. I used the existing wood columns to hang the walkways for the second level of offices. Architect Philip Banta translated my rough space plan into a workable design, and a group called Dream Builders made it real.



24 February 1993. Brand.

1993 - The weekly staff meeting at Global Business Network takes place in the commons. Anyone having to miss the meeting because they're on deadline or taking an important phone call can nevertheless hear from their office what's going on. Each office has a solid door facing the commons and a window that can be slid open or closed. The architect had specced the walkway railings as solid sheetrock, but we realized they needed to be transparent to increase visibility of the offices and of people walking around. The receptionist (who sits by the entry just behind the camera) can see who's where most of the time. The space has a certain buzz like a newspaper city room, but people can be quietly alone with their work when they need to be.

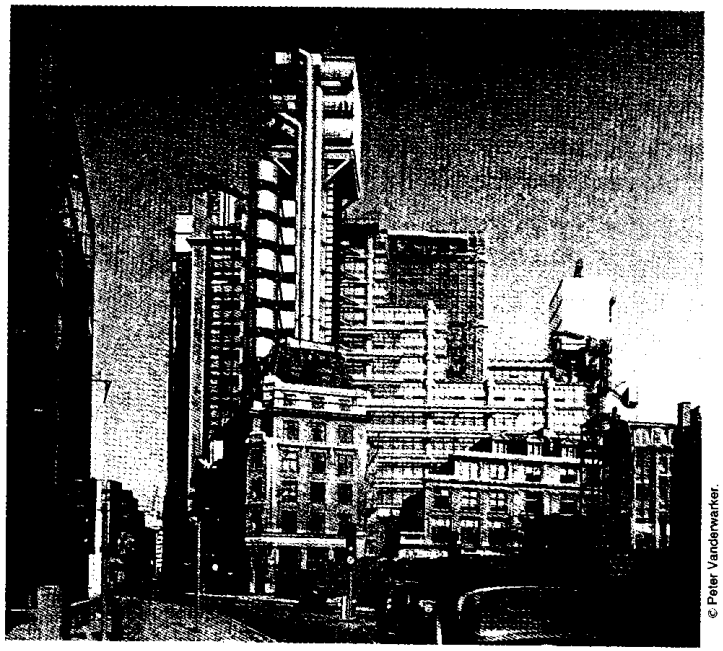
MY DESIGN for a cave-and-commons office for Global Business Network was inspired by the Mathematical Sciences Research Institute atrium (previous page) and the "playroom" in the middle of the Artificial Intelligence Lab at MIT. In an old factory we built a two-story skylit commons surrounded by fourteen small offices linked by rather grand stairs in front of a wall of factory windows.

gradually fine-tuning some areas very closely to the real human needs that exist there. Other arrangements, for which the need might become obsolete, would disappear over time. (But the space that housed them might retain faint traces, a pentimento, of their previous use.)

In organizations and in buildings, evolution is always and necessarily surprising. You cannot predict or control adaptivity. All you can do is make room for it—room at the bottom. Let the mistakes happen small and disposable. Adaptivity is a fine-grained process. If you let it flourish, you get a wild ride, but you also get sustainability for the long term. You'll never be overspecified at the wrong scale.

Have any office buildings proven adaptable over the decades on purpose? Some have managed by accident, such as the Chrysler Building (1930) and Empire State Building (1931) in New York. Their high ceilings, daylit shallow depth, and openable windows turned from embarrassments back into virtues without benefit of intent. The severely ecological architect William McDonough imitates them with his insistence that any new office building he designs be potentially convertible into housing, since he regards that as the most fundamental use of buildings, for which there will always be a need and which always guides you toward humane

LLOYD'S TOWER (1985) in London is a spectacular case of a building that set out to be adaptive and failed. Designed with great fanfare by Sir Richard Rogers, it was one of the most expensive buildings ever made. A 1988 survey showed that 75 percent of its occupants wanted to move back to their old 1958 building across the street.[30] The vaunted adaptivity in the building was all high-tech and at a grandiose scale, oblivious to the individual worker and workgroup. Endless corrective surgery on the building had to be undertaken at ruinous expense. The lesson: adaptivity too can be overspecified.



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1986 - The headquarters of the world's most celebrated insurance company, the Lloyd's building is a thrill to visit. Frank Duffy enthused: "The building's technical virtuosity is evident in every detail from door furniture to window cleaning gantry, from the sharpness of each concrete arris to the great concrete collars which attach major beams to columns, from the tiny underfloor air-conditioning units to the stainless steel ducts and pods which are such a feature of the exterior.... Every detail, however obscure, in Lloyd's is taut and perfect."[31] That was the problem. Perfection of detail is the enemy of change. Architect Rogers's admirable philosophy of adaptivity in buildings was wholly undermined by his aesthetic excess. The building is a dazzling self-contradiction.

1986 - The ground-floor "room" of Lloyd's is at the bottom of an overwhelming thirteen-story atrium. By the 1990s the company was in desperate trouble financially, with many of its prestigious "names" (individual backers) suing the company. The overwrought building became doubly embarrassing—wastefully expensive, conspicuously maladaptive.

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design.[29] His ingredients? Modest depth, high ceilings, operable windows, massive construction, raised floor rather than dropped ceiling for services, and individually controllable amenities such as window awnings. "It won't do, any more, to think in terms of cradle-to-grave," he insists. "From now on we should think of our buildings in terms of cradle-to-reincarnation."

For me the most wholesomely, loosely, intentionally adaptive of white-collar work buildings is the Main Building at MIT. A five-story boxy sprawl on the banks of the Charles in Cambridge, Massachusetts, its claim to architectural fame is the "Infinite Corridor"—a 600-foot-long hallway of such width, traffic, and straightness that the one evening each year the setting sun shines

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[29] The market supports McDonough's strategy. In 1993 an Urban Land Institute study showed that the most profitable use for the surplus office buildings left over from the 1980s real estate boom and crash was to convert them to apartments. Patricia L. Faux, *The Edge City News* (Vol. 1, No. 2), p. 8.

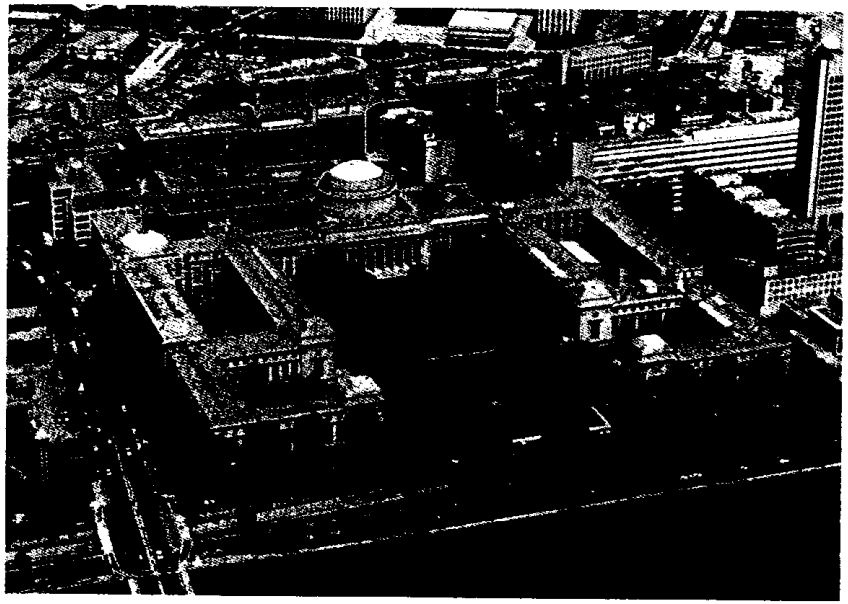
[30] Franklin Becker, *The Total Workplace* (New York: Van Nostrand Reinhold, 1990), p. 177.

[31] Francis Duffy, *The Changing Workplace* (London: Phaidon, 1992), pp. 188, 192. See Recommended Bibliography.

down its length is an occasion for university-wide celebration. Two things dominated its design in 1916. One was MIT's fifty years of exasperation with having been widely separated in buildings scattered around Boston. The other was an architect-hater named John R. Freeman, an hydraulic engineer by trade, who admired the design of New England's mills and factories and aimed to base MIT's new campus on their honesty, pragmatism, and massive connectedness.

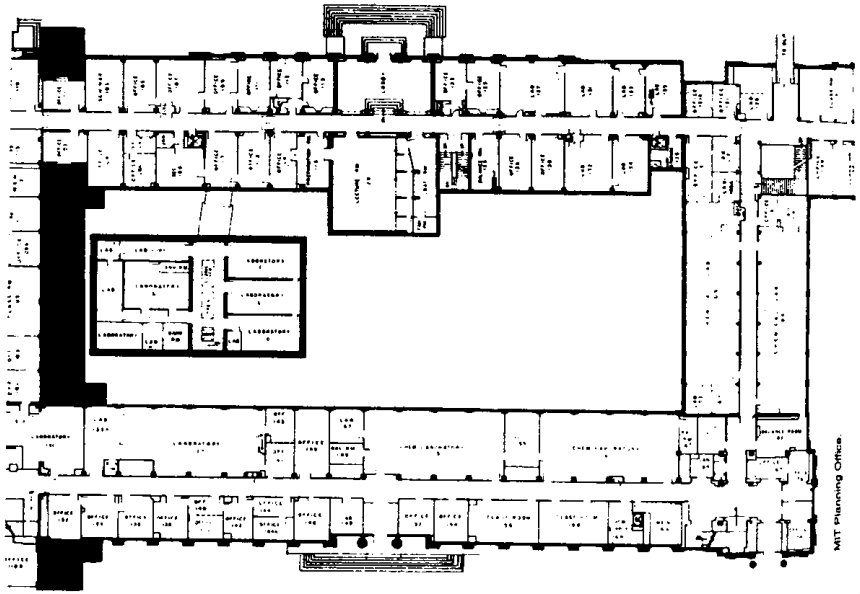
Freeman spelled out a series of design principles that guide MIT construction to this day: "An abundance of window light and a flood of controlled ventilation with tempered and filtered air; Maximum economy in energy and time of students and instructors; Maximum economy in cost of efficient service in heating, ventilating, janitor service, and general maintenance; Maximum resistance to fire, decay, and wear; Maximum economy in cost of building per square foot of useful floor space." So MIT's Main Building, which is still the core of the campus, is a web of high, narrow wings 64 feet wide—just right for a wide corridor in the middle, with space for a variety of classrooms, laboratories, and offices on each side. (A later MIT building of 55-foot width was found to be inflexibly restrictive.)

Flexibility is all-important because departmental space is reassigned constantly by the university. Some 5 percent of the university buildings change usage every year, which means a complete turnover every twenty years. Many areas started as laboratories, then converted to offices when technology obsolesced the lab, then became classrooms, then reverted to a new generation of laboratory. Overall the usage is 40 percent labs, 40 percent offices, 7 percent classrooms. This kind of flexibility is administratively possible because, unlike at other



MIT Museum. Neg. no. AE-83-01.

1983 - MIT'S MAIN BUILDING (foreground) is echoed by Building 20 (upper right). The 600-foot "Infinite Corridor" runs from the dome at the left, in front of the dome in the middle, to the right end of the building, where it forks left and right to connect to other buildings by enclosed walkways. The building combines exceptional flexibility, durability, and comfort with an urban intensity.



MIT Planning Office.

The offset corridors of the Main Building give further flexibility by offering different sizes of rooms on each side. New disciplines and technologies coursing through the building keep changing the usage, shape, and services of the rooms. This plan shows part of the east wing (right) of the Main Building.

campuses, departments do not have their own buildings.

Campus planner Robert Simha says that the primary benefits are intellectual stimulation and departmental evolution. "The thing which has characterized MIT's success is a physical environment which does not impair communication and set up arbitrary barriers to it. There are no boundaries, no locked doors, no signs that say this is mine and that is yours. You can wander unfettered from one discipline to another without even knowing you have, and bump into a physicist, then a few feet away bump into a chemist, then a mathematician. The action at MIT occurs in the public ways and intersections, just like in any town. We've seen that areas which are physical cul-de-sacs soon become intellectual cul-de-sacs."

Flexibly vague boundaries are of the essence, says Simha, because "we deal in science and technology. It's not a conservative activity. It's an innovative activity—things can expand and contract in an organic institution that is populated by people whose activities get born, live, die, and get replaced. Some things wither, and some stimulate other things." In Simha's view, funky old Building 20 (Chapter 3) is so successful because it is a direct copy in wood of the Main Building, whereas the Media Lab building "violates every principle that has guided MIT planning since 1916." It is isolated from the campus-wide warren of corridors, drastically inefficient in usable space, and inflexible in layout.

Current planning documents at MIT emphasize future building adaptivity based on: "loose fit"—generous dimensions that permit easy change of Services and usages without having to change Structure; robust construction, so that a present office can later become a lab with heavy equipment or even a library; and horizontality. This last comes from MIT's Thomas Allen, a researcher on the influence of space organization on innovation: "Both social research and experience at MIT demonstrate the benefits of buildings which are horizontally organized and low enough for stairs to be the predominant method of vertical circulation. It is estimated that communication between members of the same organization decreases by an order of magnitude [i.e., to one-tenth] when their offices are on different floors."[32]

Modern society's two great vernacular spaces, the office and the home, seem to be interpenetrating. Trends in office work (such as electronic "telecommuting" and corporate "outsourcing" of former in-house services, plus the continuing boom in tiny start-up businesses) are pushing more and more people to have a home office. Meanwhile, individual workers in office buildings are getting ever more control over their own work areas, which makes the offices increasingly homey. Both kinds of buildings thus become more fluid, as the real drivers of "learning" in buildings—the individual users—treat their buildings as an extension of themselves.

The common attribute of vernacular remodeling (and construction) is that it is done without plans. You proceed by improving on what already exists, following wherever usage demands. "Wanderer," wrote a Spanish poet, "there is no path. You lay down a path in walking."[33]

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32 *Main Campus Northeast Sector Master Plan* (Cambridge: MIT, 1989), p. 48. For a highly readable account of MIT's innovative environment see Fred Hapgood, *Up the Infinite Corridor* (New York: Addison-Wesley, 1993).

33 *"Caminante, no hay camino, se hace camino al andar."* Antonio Machado, *Proverbios y Cantares* (1930). These lines translated by Francisco Varela.