

Architecture

Even though architecture is the profession that everyone would choose if they were able to live their lives over gain, this does not diminish its stature as the noblest of all the making professions. The following are excerpts from the lecture I would give to first year students at my school of architecture:

Lecture to First-Year Students of Architecture

“...This school operates from two basic assumptions: (1) that first and foremost a house should be comfortable; and (2) that the computer has changed everything, or almost everything, in architecture.

“A house should be comfortable: this means that it should make those who live in it feel better, no matter what is happening in their lives. It should be a refuge when all their lovers have gone. It should be a haven in a world that is without meaning or purpose. A beautiful, well-designed house should bring tears to your eyes when you enter it. A house should do for its occupants what great music does for those who love great music, and it should do this *even if that means that no one “notices” it*. A house should be like good prose: it should do its job without drawing attention to itself. *Ars est celare artem*¹. A house — or any building — should not be a monument to the architect who created it! The conviction among architects that their buildings must be *statements*, that they must declare the unique originality of their creators — this belief that architecture is ultimately a personality cult — is a mark of the juvenile immaturity of architects. Remember the words of Yoshio Taniguchi, who did such a superb job in re-designing the Museum of Modern Art in New York City:

‘Raise a lot of money for me, I’ll give you good architecture. Raise even more money, I’ll make the architecture disappear.’ — quoted in Updike, John, “Invisible Cathedral” in *The New Yorker*, Nov. 15, 2004, p. 106.

“In other words, we begin with the *euthenic* architectural ideal of the early 20th century, namely, that architecture should ennoble us, and not be merely a medium for calling attention to the architect. We think that an excellent research project would be a study of the number of psychiatrists, and the suicide rate, in beautiful cities, e.g., Paris, vs. in the typical American suburb, among people of equivalent income.

Many a suicide that hung dubiously in the balances had been ratified, and carried into summary effect, through the forlorn, soul-revolting aspect of a crazy, dilapidated home. Oftentimes, without extravagance, the whole difference between a mind that spurns life and the same mind reconciled to life turns upon the outside features of that particular domestic scenery which hourly besieges the eyes. — De Quincey, Thomas, *The Confessions of an English Opium-Eater*, Part I, Illustrated Editions Co., N.Y., 1932, p. 120.

“In this school, you can design buildings with the most bizarre angles and materials you want, but you have to convince us, your fellow architects and architects-to-be, that this enhances the comfort of those who will live in the house. We require that every graduate of this school be able to convince us that he or she knows the difference between sculpture and architecture. Of course,

1. Art is the concealing of art.

part of comfort is beauty. We detest the idea that brilliant architects design buildings that are outrageous in appearance, that require us to torture ourselves into loving what we hate, loving what is ugly. (Your first assignment is to read Tom Wolfe's *From Bauhaus to Our House*.) Let me quote from one of the most important architectural books of our time:

'The architectural code [in the New Urbanism] introduces an extra layer of rigor that may be thought of as optional. It is recommended as a remedy for the unprecedented incompetence of architects in practice today. [footnote:] This extraordinary incompetence can be attributed to the education of architects — rooted in Modernist dogma — which encourages them to be heroic geniuses before they become adept practitioners. The buildings of heroic geniuses must be like nothing ever seen before in history. They are also designed in splendid isolation. They therefore occupy space rather than define space. They are anti-social by nature. They necessarily cannot fit into an established fabric of buildings by non-heroic non-geniuses.' — Kunstler, James Howard, *Home from Nowhere*, Simon & Schuster, N.Y., p. 136.

"What I am saying of houses is true of urban and commercial buildings also. The purpose of a building is not to call attention to the architect! Modern materials make possible all sorts of amazing structures. That does not mean that architects have to prove their skill at using these materials. Putting it as briefly as I can: every architect must decide if he is going to be a sculptor or an architect.

"If you say that I am just being conservative, I invite you to look at what the only people who can afford to buy the latest architecture, are living in. In the San Francisco Bay Area, for example, go to the exclusive enclaves like Atherton and Ross and Piedmont; go to the Berkeley and Oakland Hills. In the New York area, go to Scarsdale or the East Hamptons. The vast majority of homes you will see are what the architectural profession calls 'traditional'. You will have great difficulty finding homes that resemble any of the modern homes designed by the 20th century's great architects — no glass houses, no ocean liner replicas on stilts, no domes, no modernist creations that have 'so many pipe railings, ramps, hob-tread metal spiral stairways, sheets of industrial plate glass, banks of tungsten-halogen lamps and white cylindrical shapes, [that they look like] 'insecticide refiner[ies]', as Tom Wolfe put it¹.

"It may be that the wealthy have learned to make their money while sitting in the boring, sterile glass boxes that are modern office buildings, but when they come home, they want comfort, and decoration, and things that connect them with the past and with their natural surroundings.

"But to return to houses: comfortable means comfortable for those who are going to live in the building, not necessarily for us who design it. So, our first step is, through interviews, to find out what the future residents like and don't like about houses. We have a rule: 'Don't build it before they have lived in it!' That is, regardless of how the initial design may be expressed — by words alone, by words and gestures, by drawing imaginary lines in a room, by building a cardboard or plywood mockup, by using the latest 3-D computer graphics — the design is never considered final until the future residents have in imagination walked through their daily activities in each room: 'What do you do on coming home in the evening? Hang your coat on the coat tree in the hallway. Suppose it's raining... What do you do before dinner? How do you spend the evening? Which chair do you typically sit in? Where is your stereo? Suppose you want to listen to music in a different room from the one that the stereo is in... Suppose you drink a lot of coffee, and you like to make each cup from freshly ground beans: do you always go to the kitchen to do this?' Etc.

1. In *From Bauhaus to Our House*, Farrar Strauss Giroux, N.Y., pp. 3-4.

“If a home is to be comfortable, then it needs to harmonize with its environment, and so we learn how to analyze the physical surroundings: where the sun is in the sky at each hour of the day throughout the year, the nature of the soil and of the surrounding plants and trees. And, of course, we use the computer to store the data and help us with our analysis.

“One of our mottos is, ‘The whole, not the parts!’. If someone asks us if this or that room or part of a house is well-designed, we politely explain that we cannot reply to such a question until we have seen the rest of the house, and the surrounding land, and until we know the likes and dislikes of the residents. We know that this global view of design is not new and certainly not elitist:

“‘In the fragmented and seemingly directionless world of late-twentieth-century architecture, no concept beguiles the popular imagination more than that of “organic” design. The belief that all aspects of a comprehensive architectural scheme — from its landscape setting and the building itself to interior decoration — should be orchestrated as a seamless whole under the direction of one designer is the most enduring legacy from the last *fin-de-siècle* to our own.’ — Filler, Martin, “Big Mack”, *The New York Review of Books*, Feb. 20, 1997, p. 7.

“We believe that every architect needs to know not only how to create spaces, but also how to construct the buildings that enclose these spaces, which means everyone in this school learns construction engineering — how to make buildings strong and durable — and the properties of various building materials. We also learn how to use our hands, how to do carpentry, plumbing, masonry, electrical work. There are good and bad ways to design a house, and there are good and bad ways to drive a nail. We utterly despise the idea that an architect should never get his or her hands dirty. He or she certainly may delegate work to others, but that must never be because he or she has no idea of how to do the work.

“We also study interior decorating. We study spaces in much more detail — in a much more discriminating way — than any other school of architecture. Among other things, we use art and literature to help us. We learn how to make articulate what are normally only the vaguest of impressions and feelings. By the time you get your degree, you will have the same ability at discriminating, comparing, spaces, as an expert wine taster has at discriminating and comparing wines.

“We also, incidentally, teach you a method of interior decorating for people with little money and sparsely furnished houses, one that is much better than the one used by interior decorators nowadays (those con artists who earn six-figure incomes convincing people that what they really want is what the interior decorator thinks they ought to have). The method is a simple application of the method of incremental design occasionally used in the computer industry. It works like this: first, find out the global characteristics of the interior which the client wants — the style, the era, the principle colors — and provide an extensive catalog of examples for the client to choose from if s/he is unsure about what s/he wants. Gently advise the client that it is perfectly legitimate to *back into* a global design by going through the catalog comparing pairs of designs and in each case choosing the one s/he dislikes least. Second, beginning with the interior exactly as it is, through discussions with client, determine what single change in the direction of the desired design, would bring the largest increase in comfort. Then, with that change in place, proceed in the same way toward the next change, etc.)

“In passing, let me say something about furniture: if you look at furniture in museums and store displays, you can’t help but feel that furniture design now, in the present, is the desperate attempt to try to make something new out of something which is really quite simple and whose design problems were solved long ago. How much can we improve a table? People put things on a table, sit at it. What else is there to say? Maybe there is room for innovation in computer

deskware. But in the case of a table, all there is is a question of size and whether it matches other furniture. Furniture design should be the minimum change from what already works and is adequate and *has a past*.

“I said that our second basic assumption is that the computer has changed everything in architecture. By way of historical background, let me point out that in some of the making professions, e.g., architecture and all branches of engineering, a major source of expense has always been the conversion of the designer’s concept into the finished product. Or I should say, a major source of expense and *prestige*, because the craft of performing this conversion, and the artifacts produced in the process, e.g., engineering drawings, schematics, building plans, constitute, in the eyes of the layman, part of the inherent mystique of the profession. Which is one reason why the old ways die hard — as late as the 1990s there were prestigious architectural firms on the San Francisco Peninsula in which drawings were still being done by hand.

“The computer, however, will sooner or later change all this — has already changed it, in fact, in many companies. One reason is that it renders unto the machine that which is the machine’s, and unto the architect that which is the architect’s. It forces us to recognize that not everything that architects used to pride themselves upon, and used to put forth as a justification for their high fees, is equally difficult. Computer-aided design (CAD), puts difficulty in its proper place, namely, at the conceptual end. It makes possible the automatic checking of what in the integrated circuit industry are known as “design rules”, e.g., checking that all building code provisions have been met, that structural elements will support the loads they have to carry, not to mention that various good practice standards have been obeyed concerning, e.g., placement of closets, space for doors to open and close, provisions for intra-wall wiring and placement of electrical outlets, etc. It also permits the easy exploration, via three-dimensional views of the house from any angle and distance, of the effect of differential scaling on the various parts of the house, e.g., making rooms, windows, doors, arbitrarily tall, wide.

“(Don’t say: ‘I am going to be such an exceptional architect, such an architectural genius, that concerns about such trivia will be overcome by the brilliance of my designs.’ They won’t be. A number of 20th century architects believed they would and they were wrong. All you are doing when you ignore such ‘trivia’ is force the future owners and residents of your house to do the work you should have done.)

“But the machine can also help us at a more abstract level. I said that comfort is impossible without beauty. Therefore we begin with a study of what the past has considered to be the elements of beauty — for example, the golden rectangle. We look at the great buildings of the past to see how often it is present. Then we study the ratios of various building dimensions in buildings that people have deemed beautiful, and those that are deemed ugly. Listen to this:

“ ‘Renaissance artists regularly used the Golden Section [that is, the ratio $(\sqrt{5} + 1)/2$] in dividing the surface of a painting into pleasing proportions, just as architects naturally used it to analyze the proportions of a building. The first edition of *De Architectura* by Vitruvius uses the Golden Ratio [same as Golden Section] to analyze the elevation of Milan Cathedral.

‘The psychologist Gustav Fechner revived this aesthetic aspect of the Golden Ratio in his attempts to set aesthetics on an experimental basis.

‘He endlessly measured the dimensions of pictures, cards, books, sandboxes, writing paper, and windows, among other things, in an attempt to develop experimental aesthetics “from below”. He concluded that the preferred rectangle had its sides in the Golden Ratio.

‘Le Corbusier, the architect, followed this belief in its efficacy in designing The Modular. He constructed two series in parallel, one of powers of the Golden Ratio, and the other of double

these powers. A fellow architect detected the double influence of the Renaissance and the Gothic spirit in it, and correspondents rushed to support Le Corbusier's claims for its harmonizing properties.' — Wells, David, *The Penguin Dictionary of Curious and Interesting Numbers*, Penguin Books, N.Y., 1987, p. 38.

"[The golden ratio] produces the Fibonacci spiral, which expresses the dynamic form of evolving organic growth. The spiral pattern can be discerned in a chambered nautilus seashell and sunflower seed heads. The golden section manifests mathematically in the proportion of lines that compose a five-pointed star and a pentagram, which are represented by such natural forms as starfish, sand dollars, and maple leaves. The proportion of tree branch sections to one another also conform linearly, and the crowns of many trees, when framed geometrically, result in golden section proportions. Turner writes: 'Psychophysical experiments show that irrespective of culture and education, people prefer rectangles, the lengths of whose sides are related by the golden section ratio, to any other shape of rectangle. Thus, the rudiments of visual beauty are founded upon the ratio of organic growth.'" — Kunstler, James Howard, paraphrase and quote from Hale, Jonathan, *The Old Way of Seeing*, Houghton Mifflin Co., Boston, 1994 and Turner, Frederick, *Beauty: Value of Values*, University of Virginia Press, Charlottesville, Va., 1991, in *Home from Nowhere*, Simon & Schuster, N.Y., 1996, pp. 103-104.

"I am not telling you this because I want your designs to be governed by the Golden Section. I am telling you this to encourage you to look for common properties in great works of architecture of the past — common proportions, common ratios of this functional element to that, e.g., wall area to window area. Maybe you will discover a common property that no one has ever discovered before, one that is enormously helpful in producing beautiful buildings. Maybe not. But in any case, such analyses become much easier with the computer and therefore (we argue) should be carried out all the more.

"We study architectural *vocabularies* and find out what people mean by this term, and learn when it is time to think in terms of these vocabularies.

"We even experiment with adding, to our design database, representations of the *associations* that styles call up in us — styles of houses, windows, doors, roofs, furniture. I say to you that every house, every *style* of house, every piece of furniture, every *style* of furniture, carries with it feelings and associations. This structure strongly suggests, e.g., New England, the sea, that one rich people's houses, this the Old West: A given style enables people to re-enter the world which that style represents. It enables them to "go home". That is why people have such strong feelings about style, loving Edwardian, hating International, loving Craftsman, hating California Ranch House.

"We can have a list of all such associations with each element in the architectural vocabulary, along with weightings for each association — not all associations will be equally strong for each element — and then have a program to tell us "what goes best with what", or how well this goes with that. (If we want, we can explicitly state, in the computer program, what goes with what in those cases where we don't want to leave any discretion to the computer.)

"But, you may ask, how can we find out what these associations are for people in general, and not just for ourselves? One answer is by polling a large number of people who are sensitive to styles of houses and furniture. We ask each such person what associations each style calls up, showing the person various pictures, or TV images. And I think that we will find that these associations are not entirely unrelated, not entirely "personal", but, for each style, have a certain commonality. For example, we will probably find that, e.g., the words, "fireplace", "warm", "cozy",

“wood”, “books”, occur more frequently among the associations called up by Craftsman Style than by, say, International Style.

“Let me put it another way: If we had a machine that enabled us to record feelings in the way we can now record brain waves, and various people sensitive to styles of houses were to take a walk through a Craftsman neighborhood, then I contend that this machine would record similar patterns among those who liked that style. And I believe that the day is not far off when we will be able to obtain such data, and, equally important, process it, so that we will be able to compare the feelings that people have not only about houses and furniture, but music, poetry, and anything else that arouses feelings, however subtle, in people.

“At this point, let me digress briefly to say something important about the objects we use, whether they be houses or furniture or tools. Here it is: *each object was designed at a certain time in a certain culture for use in certain context*. A chair is *not* a merely a chair. If you’ve seen one chair you have *not* seen them all. Each object drags its past with it. It was designed to fit somewhere. The yellow-plastic covered kitchen chair which someone has left on an urban sidewalk for someone else to take home and use, is not just a chair, it is a piece of a context which is no longer present. It was designed for certain activities to be carried on at certain times by certain types of people.

“I say again: every piece of furniture, every useful object, every house, garage, tool, drags its past along with it, was designed to fit somewhere. It was part of “home” to some group or class of people. And until you understand this, you cannot hope to understand the objects of the past, or those of the present or the future, including the objects you design.

Similarly, we are against the stupid idea that originality in architecture is a function of the extent to which an architect has been able to abolish the past from his designs. This naive idea is one of the worst legacies of 20th century modernism. Like it or not, we live in a culture that has a past. You can’t get rid of tradition. Furthermore, you should not want to, because living in a tradition — living in a culture with a history — is one of the things that lessens the terrible alienation that so many people feel in the modern world. Consider the sterile boxes built in the fifties — ugly and already obsolete. But the houses from the early part of the 20th century and from the previous century continue to be a pleasure to look at and live in.

The justification of the use of the computer in architecture is emphatically *not* that it allows architects to create ever more abstract, ever more history-less, culture-less designs. Its primary justification is that it reduces the manual and intellectual labor that go into creating competent designs. There is absolutely no reason why you can’t create a “traditional” design using the computer. (See, e.g., Gunderson, Amy, “Click Your Way to an Architect-Designed House”, *The New York Times*, Escapes, Friday, July 6, 2007, p. D1.)

“But to return to my theme: from the associations that items in the architectural vocabulary call up in us, we can develop categories — “properties”, the computer people would call them — which we can make part of each style. Of course, for a given style, it will not merely be a question of whether a given category — say “predominance of wood” or “feeling of the ocean” — is present or not, but to what degree it is present, as expressed by a point on a scale of, say, 0 through 10. In other words, for each style, we have a *weighting* of each of the possible associations that can be part of any style.

“Then we see if we can find a set of guiding rules for the computer to follow so that it can aid us in coming up with interesting, and pleasing, combinations of these styles — so it can help us determine ‘what goes with what’. Who knows? Maybe we will discover a whole new basis of aesthetics in this way?

“But now let me conclude with some other things we study in this school.

“We study how to deal with clients and city bureaucrats. We study how to run a business...

“Some of you may be thinking, ‘These are hard times. There is very little work for architects. What shall we do?’ The only reply I can make is, ‘Do the best you can!’ In the main office of this school, you will see a bulletin board reserved for status reports on the current jobs and annual incomes of past graduates. That is the best *we* can do for *you*: keep you supplied with the important economic facts as you pursue your education. In the last analysis, I hope that you are here because you want to enlist in the fight for beautiful buildings, no matter what your role may turn out to be. Some of you may have to become contractors temporarily, or even permanently, or go into real estate. Some of you may have to settle for doing renovations. But I shouldn’t say “settle for”, because that implies that renovations cannot be a worthwhile challenge. The next time you are walking through a drab, lower-middle-class residential district, pick a house you regard as particularly depressing and ask yourself what you would do to make it a place that you would be willing to live in, at least temporarily. What would you do to the landscaping? What criteria would you follow in order to arrive at a plan for house and yard? How would you prioritize the work? Do not scoff at such an exercise: value it for the background it will give you when you come to designing a house.

Some of you may have to (or want to!) go into historical preservation. Many of you may have to work out of your homes. Nevertheless, you can still exert your influence; you can still make choices on the side of the comfortable and the beautiful.”

(End of “Lecture...”)

Anyone who doubts Kunstler’s assessment of the state of modern architecture quoted above need only look at what was built in the Oakland Hills following the fire of 1991. If there ever was a case of too much money governed by too little taste and chasing too little talent, this is it.

“Almost from the outset of reconstruction, reviews from the New York Times on down have taken potshots at the architectural quality of fire zone reconstruction. The refrains are familiar by now: The new homes are uninspired and cliché-laden; they’re too bulky for their sites; or they’re jarringly alien to their surroundings.

“Perhaps more telling than critical yammering, however, is the fact that many former residents have voiced their own dismay by opting out of reconstruction altogether.” — Gellner, Arrol, “Out of the Ashes”, *San Francisco Chronicle*, Home section, East Bay Edition, Oct. 16, 1996, p. 4.

But maybe the fault is not entirely the architects’, given the low level — the non-existence! — of architectural taste among Americans, be they poor or (as in this case) rich. The right way to rebuild after the fire, would have been by *beginning* with the landscaping. New rules were wisely put in place regarding the kind of trees and undergrowth that would be allowed in the future, to prevent a repeat occurrence of the ‘91 fire. Fine. These define the environment into which the new housing will fit. It doesn’t take a genius, especially in this computer age, to come up with an accurate depiction of the landscape of five years or more from now. With that agreed upon, the design work could begin, all of it guided by the slogan, *We are building a neighborhood*. Unfortunately, typical American indifference to such matters, made worse by the arrogance that seemed to come with the windfalls of insurance money, worked in exactly the opposite direction:

“‘Since people these days think mainly about the building and not the site, we ended with very large houses on very little open space.’ — Gita Bustani, design review supervisor at Oakland’s Office of Planning and Building, quoted in *ibid.*, p. 4.

“‘Architect Judy Rowse, an Oakland planning commissioner at the time of the fire, recalls, ‘We tried to institute floor area ratios (a method of limiting building bulk based on lot size), but the City Council thought it would give people a disincentive to build.’

“‘In the absence of floor area ratios, owners naturally chose to rebuild as much house as possible on their sites, and most homes ended up substantially larger than their predecessors. The stunning vistas, revealed by the fire’s destruction of a once-dense tree cover, also affected the new designs. “With all these great views suddenly available, people built higher to see over their neighbors,” says Rowe.” — *ibid.*, p. 4.

The slogan of this upper class booboisie was, and remains, *Each against all*. Mercifully, trees and bushes will someday cover up some of the worst examples of what this attitude has produced.

Exercises for Architecture Students

Exercise 1. One of the fundamental principles of modern architecture may be summarized as “the physical distance between spaces should be inversely proportional to how closely related the activities are for which the spaces are designed”. (See, e.g., Alexander, Christopher, *Notes on the Synthesis of Form*, Harvard University Press, Cambridge, Mass., 1970.) Thus, e.g., the dining room should be next to the kitchen; there should be a bathroom near the bedroom. But as a limbering-up exercise for the architectural mind, nothing beats thinking of ways, preferably outrageous, one can break this rule, and then contemplating the “feel” of the interiors so produced. As a start, consider a house in which the fireplace is located in the wall of a landing on the stairway leading to the second floor. Think what it would be like merely to walk up or down the stairs in such a house, or to sit in the living room listening to the fire crackling and flames flickering from such an odd distance and angle.

Exercise 2. Design a house with as many fireplaces as possible, e.g., in closets, wall-niches, in the kitchen, garage, etc. How small can a working fireplace be made?

Exercise 3. Design a *portable* fireplace (to be advertised, say, as “a companion for the poor and lonely”), which could be placed on nighttables, desktops, kitchen counters, in bathrooms. This exercise will require investigating local and state laws as to what exactly constitutes a fireplace, or, rather, what exactly constitutes “a fire burning legally in a legal fireplace”. Is a candle a fireplace? What about a short candle inside a glass model of a fireplace? Is a cigarette, cigar, or pipe a fireplace? Or any of these inside a glass model of a fireplace? Is a kerosene heater? Would it be legal to have a miniature fireplace measuring, say, a foot in each dimension, which burned wood and had a flexible chimney which was attached to a hole in a window? Is it possible to make an economical “smoke compactor” which would do away with the need for a chimney altogether (although it would, of course, require that the smoke be emptied once in a while)?

Exercise 4. “Pre-Destroyed” Houses: design an explodable house, i.e., a house which, when an explosion occurs, e.g., from a bomb penetrating the roof or landing nearby, falls apart in a pre-established manner so that it can be easily reassembled. For example, the parts might be held

together by long, flexible cables which are normally kept hidden, and which can simply be retightened after the explosion.

Or, as a normal building practice, why not pre-mark all bricks, stones, pieces of wood in a house so that, after the house is destroyed, the pieces can be more easily assembled?

(When a house falls down, there are still those few moments when it is still a house; if the family were looking at it, they might well be thinking, "But the bedroom floor would still be flat now; just a little tilt now, but it could still be lived in, we wouldn't mind!" And for those floors that sank vertically, even in mid fall, the family might be thinking, "The floors would be still held together enough to be livable if they were flat. Dear God, we'll let you wreck our house up to this point if only we can have the rest!" (After seeing film on the evening TV news of Tudor house falling into sink-hole in San Francisco during the rains of Dec. 1995))

Exercise 5. (a) Describe in detail the daily life of a family that lived in a house in which all the doorways were rotated 180 degrees from their current orientation, i.e., in which each doorway was about 2-1/2 feet *high* and 6-1/2 feet *wide*. Describe the movements the family might develop to get through such doorways with the least discomfort. How would a person carrying a tray of sandwiches, drinks, and soup get through such a doorway?

(b) Describe in detail the daily life of a family that lived in a house in which all the doors rotated horizontally. That is, each door, instead of being mounted on hinges, was mounted on a horizontal pivot through the middle. To pass from one room to the next, you would lie on it and allow it to dump you, head first, onto the floor in the next room.

Exercise 6. Create a catalog of bookshelves, ranging upward in price from the very inexpensive. The catalog may include original designs by the person creating the catalog, but by no means should it be limited to such designs. Each shelf should have an accompanying set of parameters including, apart from price: typical time from placement of order to arrival at customer's residence or business; shipping costs; ease of setting up shelf in customer's residence or business (i.e., does the shelf need to be installed or constructed by someone else? If not, how easy is it for the layman to construct or install, in particular, how long does it typically take, what tools are needed?, etc.).

This exercise should be part of the education of every architect and industrial designer. The making of a catalog is aimed at cultivating the idea in the student that there is nothing wrong with not always designing things from scratch, and that knowing where the right thing can be obtained, will often provide a less expensive, and equally satisfactory, solution to a customer's needs.

To my knowledge, the problem of how to make inexpensive, easily installed, attractive, portable, bookshelves of any size, is still unsolved. In 1990, I was quoted a price of \$4,000 to have a set of bookshelves built onto two walls of a room, the shelves covering a length of 15 feet along both walls and running from ceiling to mid-wall; external appearance of the wood was not important, since the shelves would be painted. The price was quoted by an independent carpenter who was given the option of working in his spare time and taking several months to complete the project. This is an extreme case, of course — one can always go to the other extreme and use the student's venerable solution, namely, brick-and-board. I have experimented with an even more inexpensive variation, in which two pairs of equally tall books (or, in this case, three-ring binders) at the ends of each shelf were used to support the shelves, the theory being that one would very

seldom need to remove both books at the same time. But the binders proved to be unstable supports. Or one can buy unpainted oak-veneer. Or plastic modules. But price climbs rapidly when a large amount of shelving space is needed.

When I speak of a “solution”, I have in mind something that, say, Buckminster Fuller might have come up with. For example, we might begin with the idea of shelves like a Jacob’s ladder which is suspended from hooks in the ceiling, then ask if there is any way to do away with the hooks. One answer may be a structure patterned after a child’s swing, in which each end of a horizontal beam is supported by tripods. Parallel double chains with cross-chains like tire chains, a shelf-width apart, are hung from the beam, with the ends of each shelf resting on the cross-chains.

Exercise 7. Make a meticulous investigation of the cheapest possible ways to repair (*not* rebuild!) old, ramshackle buildings. This exercise would be nothing less than the beginning of a new architectural discipline, namely, a study of the mechanics of deterioration and decay. It would involve studying the changes in the strength of wood and other building materials as they age, as well as studying what, if any, engineering techniques can be applied to preventing buildings which are on the verge of falling down, from falling down. The investigation might begin with a study of the familiar house of cards. Where, exactly, are the major stresses and strains in a house of cards? Are there better and worse ways to build such houses?

Exercise 8. Make a brief study of inventions like tractor treads, sandals, and shoes, in which one desirable or necessary environment is easily carried into others. A tractor tread is an artificial road for a wheeled vehicle. But so is a railroad track. The stroke of genius in the case of the tractor tread was to realize that there *is* an answer to the question, “How can we make an artificial road that will go wherever we want it to go, without our having to build it first?”

Sometimes I think that the tractor tread ranks as one of the most ingenious inventions of all time. Try to imagine the thought process that might have led up to it: perhaps a civil engineer, worn out at the end of a hot day of road building, tried to find some relief by reciting basic questions:

“What are we doing here?”

“Building a road.”

“Why?”

“So cars and trucks will be able to go where they haven’t been able to go in the past.”

“But suppose they want to go somewhere other than where the road goes.”

“Then we have to build another road.”

[Pause]

“It’s too bad that cars and trucks can’t take a road with them, and then just lay it down wherever they want to go.”

“But if they want to go a long distance, then they’d need to carry a long road. How could they do that?”

“True.”

[Pause]

“On the other hand, once a car has driven over a piece of road, it no longer needs that piece. Too bad ...”

“... it can’t use it over again! Yes! Too bad that once the piece of road is behind the car, it can’t somehow be moved around to the front so the car can go over it again!”

“Yes, but who’s going to want to do all that work of carrying pieces of road from the back to the front?”

“You’re right. Too bad there isn’t a machine to do that: take a piece of road from the back and move it around to the front. Over and over.

“Wait a minute! What about a circle? A single piece of road in a circle! A belt! A circular belt that goes round and round so that at any given time half of it is always the road for the car!”

“Brilliant!”

“...Admiral Bacon produced a design for a caterpillar tractor which would cross a trench by means of a portable bridge which it laid down before itself and hauled up after passing over...” — Churchill, Winston, “The Origin of Tanks and Smoke”, in *The World Crisis* (a history of World War I and its aftermath), vol. 2, Charles Scribner’s Sons, N.Y., 1951, p. 63.

Exercise 9. Design an apartment or a house for discomfort. This is not simply a matter of listing all the things that people don’t like — being cold in winter, hot in summer, having mismatched furniture and color schemes, rooms too small or too large for their purpose. Far more torment is achieved if things seem to go well for a while, then go wrong. Devishly unpredictable drafts, floors which suddenly are no longer level, doors which suddenly no longer hang properly, paint which starts to peel prematurely, plumbing which stops working at the worst possible moments, a cellar which suddenly starts filling with water during a mild rainstorm, a foundation which starts to crack despite numerous previous inspections.

Exercise 10. A “most-with-the-least” problem: given an old, wooden, one-car garage in the rear corner of a lot, and given city regulations that forbid such a building from being converted into a habitable dwelling, still less a habitable dwelling with a fireplace, give instructions for converting the garage (*not* replacing it, since that might alert neighbors and city officials) into the most comfortable dwelling you can for a bookish man. The converted building should have several windows, each with a window box for flowers, facing onto the back lawn, plus a door opening onto same. But from the street, the building should look pretty much as it did before. It should have a fireplace, running water and a (possibly dry) toilet. Thus, clearly, you will have to come up with a way of removing smoke from the fireplace without the neighbors knowing there is a fireplace in the building, e.g., by running an insulated metal tube up a tree that overhangs the building.

Exercise 11. Select a house, new or old, in a residential neighborhood, and using whatever information resources you have available, come up with an estimate of the total number of individual parts in the house. Duplicate parts, e.g., bricks, boards of the same size and wood, shingles, etc. are to be counted individually.

(End of “Exercises...”)

Additional Thoughts

Houses are music; music is houses. Well, some houses, some music. But on more than one occasion I have been able to say to myself, “I know how the cello part of this house goes!” I can

show anyone with eyes to hear and ears to see, a house in Piedmont, Calif., above Oakland, which is the last movement of Mozart's *Piano Concerto No. 14*. Nearby is a house that is the last movement of Schröter's *Piano Concerto No. 3*. Somewhere high in the Berkeley or Oakland hills I know there is a house (although I have never seen it) that is the last movement of Rachmaninov's *Variations on a Theme by Paganini*. The house is pre-post-modern, the living room has big arched windows that look down on the city below and on the bridges and the Bay in the distance. The walls are brilliant white, the floors polished, blond wood. There is a white couch (but one or two of the chairs are gray!). There are a few abstract metal sculptures: spindly, coal black, tree-like. On a clear night you see the lights of the city which are perfectly round (and white!) pin-points.

What do the rich talk about in their houses? Certainly this is a question as important as any currently being posed in sociology. I would die a happy man if I merely knew what the *distribution* of topics is. What percentage of conversation is about money? About travel? About the family? About the house itself? If I were going to embark on a life of crime, I would begin by placing hidden microphones in the most beautiful mansions I could find.

Women who die in beautiful houses: what is it like to lie in bed, attended now by a nurse and seldom seeing the servants who have worked for you and perhaps loved you for so many years, to lie surrounded by this work of art in which you have been seen, and admired, and made others gasp with envy at your taste, but also in which you have had countless hours of splendid peace, reading in this favorite sunlit room, playing the piano in that one, with the shadows of the leaves moving on the floor, this house in which you have lain in bed in the morning, listening to the birds, and for which you have tended your beloved garden, or, rather, supervised the loyal gardeners in tending it — to have lived in beauty, and now, to be lying in bed, knowing that soon there will be no more of this for you, and, worst of all, that others will, sooner or later, be imposing their taste on this great presence which has been yours for so long?

Now that Modernism in architecture is in retreat — and rightly so, if only because it's good to have a change now and then — we must not forget that there is always a means available to return to it without building more buildings, namely, literature and art. The BBC productions of Agatha Christie's Hercule Poirot stories do a masterful job of showing what the world was like when Modernism was new — when buildings looked and felt like luxury liners, when streamlining defined the forms of the day. Perhaps certain novels written during the period will be sufficient to communicate what it was like to live in buildings like Le Corbusier's that are now the subjects of increasing scorn. If not, then we will have to continue to rely on the BBC, and upon modern novelists, to show us that living in Modern buildings was once an exciting thing to do.

“Everyone becomes different on entering another person's house.” Proust, Marcel, *Cities of the Plain*, in *Remembrance of Things Past*, tr. C. K. Scott Moncrieff, Vintage Books, N.Y., 1970, p. 108.

What is the difference between outside and inside? Putting it another way, if we take a small, enclosed space — a room, say, or a hall — it is obvious that this is an inside. Now suppose we allow the space to expand continuously, until it is the size of, say, the Huston Astrodome. Is it still an inside? At what point does it become debatable that it is still an inside? When one can no longer see all the walls at the same time? When one can no longer see the roof? When, at night, with all lights extinguished, a randomly selected person brought blindfolded into the space, and then allowed to remove the blindfold and conduct any experiments he or she wants, has difficulty deciding if he or she is inside a building or outside?

Of all the houses and apartments in the world, there are some that, if you could visit them, you would judge to be the ones where you would be least unhappy. Probably not all of them would be expensive homes. In fact, you might be able to afford some of them right now. Think of it: somewhere, right now, is a place where, given your income and savings, you could be as happy as it is possible for you to be on this earth, but you will go to your grave never having found out where it is.

A warning to intellectuals: beware that the achievement of your lifelong goal of owning and living in a beautiful house, does not destroy the alienation and unhappiness that was the primary source of your intellectual efforts. Beware that your life, which up till now has been centered on doing each day what is always the one thing you wish you didn't have to do, doesn't gradually become centered on the countless small, daily pleasures that constitute living in a house that you love. Beware that you do not gradually become famous for your house, instead of for your work. Beware that your house doesn't start to wear *you*. Fate does artists and intellectuals a favor when it forces them to live in shabby conditions, because since their lives have no ornament or celebration, it must be achieved entirely through their work.

“The intellect of man is forced to choose
Perfection of the life, or of the work,
And if it take the second must refuse
A heavenly mansion, raging in the dark.”

— Yeats, William Butler, “The Choice”

Tract houses: house burgers(observation by a friend)

Lesser-known modern architectural styles: Salvation Army Modern, Early Retirement.

A useful, and often amusing, exercise for the architecturally-minded, is to contemplate buildings being adapted for purposes they weren't intended. For example, imagine a cathedral being converted into an apartment building. At night, hundreds of small windows at all levels of the

dark spires would glow with electric light; small families (father, mother, one child) who had grown accustomed to walking around in rooms in which one of the walls sloped steeply inward, would be preparing the evening meal, or sitting under friendly lamps, reading, or simply sitting at a window, looking down at the city far below, or at sun's last rays on the horizon.

When it comes to companionship, a good fireplace is far better than a mediocre relationship.

Happiness is a house with two fireplaces.

The sense of alienation that so many people feel in American cities, comes from the felt absence of the message: *We want you to be happy!* Indifference is built into the very walls of American cities. An American city is merely a container for businesses. The great European cities, on the other hand, invariably give us the sense that they are the work of people who were, and are, abundantly aware of the pleasures of civilization: *And we have this for you! And this! And this! We are doing everything we can to make your life a little less sad.* A great city nourishes you. A great city places in you the knowledge of what it means to be a human being. Living among beautiful things in itself makes your life less dreadful, makes you want to postpone ending your life for at least one more day. Living among ugly things — in other words, living in virtually any American city — forces you to spend a major part of your meager energy in finding a reason to continue to put one foot in front of the other, in extending your life for another hour.

Certainly one thing that helps to make a city be something other than a mere container for businesses, is the reduction of automobile traffic. (Cf. Salzburg, Vienna.) The virtual elimination of the automobile from a street or boulevard *in itself* goes a long way toward eliminating the sense of alienation we feel in streets that are full of traffic. European cities give the lie to those American fools who say that it is not possible to have cities in which the automobile is not king (or in which there are no limits to the heights of buildings).

A city — a community — is civilized in proportion as it cares about trees, and perhaps the quickest way to tell if a city is worth visiting, is by finding out what percentage of the land area is devoted to parks. (Consider, e.g., Munich's English Garden, San Francisco's Golden Gate Park, New York's Central Park.)

“A well-kempt forest begs Our Lady's grace;
Someone is not disgusted, or at least
Is laying bets upon the human race
Retaining enough decency to last;
The trees encountered on a country stroll
Reveal a lot about the country's soul.

“A small grove massacred to the last ash,
An oak with heart-rot, give away the show;
This great society is going smash;
They cannot fool us with how fast they go,
How much they cost each other and the gods!

Architecture

A culture is no better than its woods.”

— W. H. Auden, “Bucolics: II Woods”

A great city makes us want to participate in the ceremony of everyday life. Now we take our umbrella, open the door, take the elevator down to the street level. Now we greet the doorman, exchange a few words with him. Now we stroll along ... St., admire the trees. Now we buy a *Times* from the vendor we have known for years, and exchange a few words with him. Now we enter ... and have a cup of coffee. Now we cross the cobblestone street when the light changes, sit on our favorite bench in the park, enjoy the soft breeze, look at the museum and government building across the way, read the paper. Now we...

