

# DESIGN FOR THE REAL WORLD

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Professor Papanek has specialized for many years in design for the handicapped, the Third World, the sick, the poor, and people in need. He has taught and travelled in seven countries, and lived with an Eskimo tribe as well as with the Hopi Indians of the American South West. With James Hennessey, he is co-author of the recently published *Nomadic Furniture*.

## Preface

There are professions more harmful than industrial design, but only a very few of them. And possibly only one profession is phonier. Advertising design, in persuading people to buy things they don't need, with money they don't have, in order to impress others who don't care, is probably the phoniest field in existence today. Industrial design, by concocting the tawdry idiocies hawked by advertisers, comes a close second. Never before in history have grown men sat down and seriously designed electric hairbrushes, rhinestone-covered file boxes, and mink carpeting for bathrooms, and then drawn up elaborate plans to make and sell these gadgets to millions of people. Before (in the 'good old days'), if a person liked killing people, he had to become a general, purchase a coal-mine, or else study nuclear physics. Today, industrial design has put murder on a mass-production basis. By designing criminally unsafe automobiles that kill or maim nearly one million people around the world each year, by creating whole new species of permanent garbage to clutter up the landscape, and by choosing materials and processes that pollute the air we breathe, designers have become a dangerous breed. And the skills needed in these activities are taught carefully to young people.

In an age of mass production when everything must be planned and designed, design has become the most powerful tool with which man shapes his tools and environments (and, by extension, society and himself). This demands high social and moral responsibility from the designer. It also demands greater understanding of the people by those who practise design and more insight into the design process by the public. Not a single volume on the responsibility of the designer, no book on design that considers the public in this way, has ever been published anywhere.

In February 1968, *Fortune* magazine published an article that foretold the end of the industrial design profession. Predictably, designers reacted with scorn and alarm. But I feel that the main arguments of the *Fortune* article are valid. It is about time that industrial design, as we have come to know it, should cease to exist. As long as design concerns itself with confecting trivial 'toys for adults', killing machines with gleaming tailfins, and 'sexed-up' shrouds for typewriters, toasters, telephones, and computers, it has lost all reason to exist.

Design must become an innovative, highly creative, cross-disciplinary tool responsive to the true needs of men. It must be more research-oriented, and we must stop defiling the earth itself with poorly-designed objects and structures. For the last ten years or so, I have worked with designers and student design teams in many parts of the world. Whether on an island in Finland, in a village school in Indonesia, an air-conditioned office overlooking Tokyo, a small fishing village in Norway, or where I teach in the United States, I have tried to give a clear picture of what it means to design within a social context. But there is only so much one can say and do, and even in Marshall McLuhan's electronic era, sooner or later one must fall back on the printed word.

Included in the enormous amount of literature we have about design are hundreds of 'how-to-do-it' books that address themselves exclusively to an audience of other designers or (with the gleam of textbook sales in the author's eye) to students. The social context of design, as well as the public and lay reader, is damned by omission.

Looking at the books on design in seven languages, covering the walls of my home, I realized that the one book I wanted to read, the one book I most wanted to hand to my fellow students and designers, was missing. Because our society makes it crucial for designers to understand clearly the social, economic, and political background of what they do, my problem was not just one of personal frustration. So I decided to write the kind of book that I'd like to read.

This book is written from the viewpoint that there is something basically wrong with the whole concept of patents and copyrights. If I design a toy that provides therapeutic exercise for handicapped children, then I think it is unjust to delay the release of the design by a year and a half, going through a patent application. I feel that ideas are plentiful and cheap, and it is wrong to make money from the needs of others. I have been very lucky in persuading many of my students to accept this view. Much of what you will find as design examples throughout this book has never been patented. In fact, quite the opposite strategy prevails: in many cases students and I have made measured drawings of, say, a play environment for blind children, written a description of how to build it simply, and then mimeographed drawings and all. If any agency, anywhere, will write in, my students will send them all the instructions free of charge. I try to do the same myself. An actual case history may explain this principle better.

Shortly after leaving school nearly two decades ago, I designed a coffee table based on entirely new concepts of structure and assembly. I gave a photograph and drawings of the table to the magazine *Sunset*, which printed it as a do-it-yourself project in the February 1953 issue. Almost at once a Southern California furniture firm, Modern Colour, Inc., 'ripped-off' the design and went into production. Admittedly they sold about eight thousand tables in 1953. But now it is 1970. Modern Colour has long since gone bankrupt, but *Sunset* recently reprinted the design in their book *Furniture You can Build*, so people are still building the table for themselves.

Thomas Jefferson himself entertained grave doubts as to the philosophy inherent in a patent grant. At the time of his invention of the hemp-break, he took positive steps to prevent being granted a patent and wrote to a friend: 'Something of this kind has been so long wanted by cultivators of hemp that as soon as I can speak of its effect with certainty, I shall probably describe it anonymously in the public papers in order to forestall the prevention of its use by some interloping patentee.'

I hope this book will bring new thinking to the design process and start an intelligent dialogue between designer and consumer. It is organized

into two parts, each six chapters long. The first part, 'Like It Is', attempts to define and criticize design as it is practised and taught today. The six chapters of 'How It Could Be' give the reader at least one newer way of looking at things in each chapter.

I have received inspiration and help in many parts of the world, over many years, in forming the ideas and ideals that made the writing of this book so necessary. I have spent large chunks of time living among Navahos, Eskimos, and Balinese, as well as spending nearly one-third of each of the last seven years in Finland and Sweden, and I feel that this has shaped my thoughts. In Chapter Four, 'Do-It-Yourself Murder', I am indebted to the late Dr Robert Lindner of Baltimore, with whom I corresponded for a number of years, for his concept of the 'Triad of Limitations'. The idea of *kymmenykset* was first formulated by me during a design conference on the island of *Suomenlinna* in Finland in 1968. The word *Ujamaa*, as a simple way of saying 'we work together and help each other without colonialism or neo-colonial exploitation', was supplied in Africa during my UNESCO work.

Mr Harry M. Philo, an attorney from Detroit, is responsible for many of the examples of unsafe design cited in Chapter Five. Much in Chapter Eleven, 'The Neon Blackboard', reflects similar thinking by my two good friends, Bob Malone of Connecticut, and Bucky Fuller.

Four people are entitled to special thanks. Walter Muhonen of Costa Mesa, California, because the example set by his life has kept me going, even though my goals seemed unattainable. He taught me the real meaning of the Finnish word *sisu*. Patrick Decker of College Station, Texas, for persuading me to write this book. Telle' Olof Johansson of Halmstad and Stockholm, Sweden, for arguing the fine points of design with me, long into many nights; and for making the actual completion of this book's first Swedish edition possible. My wife, Harlanne, helped me to write what I wanted to say, instead of writing what seemed to sound good. Her searching questions, criticism, and encouragement often made all the difference.

The incisive thinking and the help of my editor, Verne Moberg, have made this revised edition sounder and more direct. In an environment that is screwed up visually, physically, and chemically, the best and simplest thing that architects, industrial designers, planners, etc., could do for humanity would be to stop working entirely. In all pollution, designers are implicated at least partially. But in this book I take a more affirmative view: It seems to me that we can go beyond not working at all, and work positively. Design can and must become a way in which young people can participate in changing society.

As socially and morally involved designers, we must address ourselves to the needs of a world with its back to the wall while the hands on the clock point perpetually to one minute before twelve.

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**WHAT IS DESIGN?**

## A Definition of Design and the Function Complex

The wheel's hub holds thirty spokes  
Utility depends on the hole through the hub.  
The potter's clay forms a vessel.  
It is the space within that serves.  
A house is built with solid walls  
The nothingness of window and door alone  
renders it usable,  
That which exists may be transformed  
What is non-existent has boundless uses.

LAO-TSE

All men are designers. All that we do, almost all the time, is design, for design is basic to all human activity. The planning and patterning of any act towards a desired, foreseeable end constitutes the design process. Any attempt to separate design, to make it a thing-by-itself, works counter to the inherent value, of design as the primary underlying matrix of life. Design is composing an epic poem, executing a mural, painting a masterpiece, writing a concerto. But design is also cleaning and reorganizing a desk drawer, pulling an impacted tooth, baking an apple pie, choosing sides for a back-lot baseball game, and educating a child. Design is the conscious effort to impose meaningful order.

The order and delight we find in frost flowers on a window pane, in the hexagonal perfection of a honeycomb, in leaves, or in the architecture of a rose, reflect man's preoccupation with pattern, the constant attempt to understand an ever-changing, highly complex existence by imposing order on it - but these things are not the product of design. They possess only the order we ascribe to them. The reason we enjoy things in nature is that we see an economy of means, simplicity, elegance and an essential tightness in them. But they are not design. Though they have pattern, order, and beauty, they lack conscious intention. If we call them design, we artificially ascribe our own values to an accidental side issue. The streamlining of a trout's body is aesthetically satisfying to us, but to the trout it is a by-product of swimming efficiency. The aesthetically satisfying spiral growth pattern found in sunflowers, pineapples, pine cones, or the arrangement of leaves on a stem can be explained by the Fibonacci sequence (each member is the sum of the two previous members: 1, 1, 2, 3, 5, 8, 13, 21, 34 .. .), but the plant is only concerned with improving photosynthesis by exposing a maximum of its surface. Similarly, the beauty we find in the tail of a peacock, although no doubt even more attractive to a peahen, is the result of intra-specific selection (which, in the case cited, may even ultimately prove fatal to the species).

Intent is also missing from the random order system of a pile of coins. If, however, we move the coins around and arrange them according to size and shape, we add the element of intent and produce some sort of symmetrical alignment. This symmetrical order system is a favourite of small children, unusually primitive peoples, and some of the insane, because it is so easy to understand. Further shifting of the coins will produce an infinite number of asymmetrical arrangements which require a higher level of sophistication and greater participation on the part

of the viewer to be understood and appreciated. While the aesthetic values of the symmetrical and asymmetrical designs differ, both can give ready satisfaction since the underlying intent is clear. Only marginal patterns (those lying in the threshold area between symmetry and asymmetry) fail to make the designer's intent clear. The ambiguity of these 'threshold cases' produces a feeling of unease in the viewer. But apart from these threshold cases there are an infinite number of possible satisfactory arrangements of the coins. Importantly, none of these is the one right answer, though some may seem better than others.

Shoving coins around on a board is a design act in miniature because design as a problem-solving activity can never, by definition, yield the one right answer: it will always produce an infinite number of answers, some 'righter' and some 'wronger'. The 'Brightness' of any design solution will depend on the meaning with which we invest the arrangement.

Design must be meaningful. And 'meaningful' replaces the semantically loaded noise of such expressions as 'beautiful', 'ugly', 'cool', 'cute', 'disgusting', 'realistic', 'obscure', 'abstract', and 'nice', labels convenient to a bankrupt mind when confronted by Picasso's 'Guernica', Frank Lloyd Wright's Falling-water, Beethoven's Eroica, Stravinsky's *Le Sacre du printemps*, Joyce's *Finnegans Wake*. In all of these we respond to that which has meaning.

The mode of action by which a design fulfils its purpose is its function.

'Form follows function', Louis Sullivan's battle cry of the 1880s and 1890s, was followed by Frank Lloyd Wright's 'Form and function are one'. But semantically, all the statements from Horatio Greenough to the German Bauhaus are meaningless. The concept that what works well will of necessity look well has been the lame excuse for all the sterile, operating-room-like furniture and implements of the twenties and thirties. A dining table of the period might have a top, well proportioned in glistening white marble, the legs carefully nurtured for maximum strength with minimum materials in gleaming stainless steel. And the first reaction on encountering such a table is to lie down on it and have your appendix extracted. Nothing about the table says: 'Dine off me.' The style international and die neue Sachlichkeit have let us down rather badly in terms of human value. Le Corbusier's house as *la machine a habiter* and the packing-crate houses evolved in the Dutch De Stijl movement reflect a perversion of aesthetics and utility.

'Should I design it to be functional,' the students say, 'or to be aesthetically pleasing?' This is the most heard, the most understandable, and the most mixed-up question in design today. 'Do you want it to look good, or to work?' Barricades erected between what are really just two of the many aspects of function. It is all quite simple: aesthetic value is an inherent part of function. A simple diagram will show the dynamic actions and relationships that make up the function complex:

It is now possible to go through the six parts of the function complex (above) and to define every one of its aspects.

**METHOD:** The interaction of tools, processes, and materials. An honest use of materials, never making the material seem that which it is not, is good method. Materials and tools must be used optimally, never using one material where another can do the job less expensively and/or more efficiently. The steel beam in a house, painted a fake wood grain; the moulded plastic bottle designed to look like expensive blown glass; the 1967 New England cobbler's bench reproduction ('worm holes \$i extra') dragged into a twentieth-century living room to provide

dubious footing for Martini glass and ash tray: these are all perversions of materials, tools, and processes. And this discipline of using a suitable method extends naturally to the field of the fine arts as well. Alexander Calder's 'The Horse', a compelling sculpture at the Museum of Modern Art in New York, was shaped by the particular material in which it was conceived. Calder decided that boxwood would give him the specific colour and texture he desired in his sculpture. But boxwood comes only in rather narrow planks of small sizes. (It is for this reason that it traditionally has been used in the making of small boxes: hence its name.) The only way he could make a fair-sized piece of sculpture out of a wood that only comes in small pieces was to interlock them somewhat in the manner of a child's toy. 'The Horse', then, is a piece of sculpture, the aesthetic of which was largely determined by method. For the final execution at the Museum of Modern Art Calder chose to use thin slats of walnut, a wood similar in texture.

When early Swedish settlers in what is now Delaware decided to build, they had at their disposal trees and axes. The material was a round tree trunk, the tool an axe, and the process a simple kerf cut into the log. The inevitable result of this combination of tools, materials, and process is a log cabin.

From the log cabin in the Delaware Valley of 1680 to Paolo Soleri's desert home in twentieth-century Arizona is no jump at all. Soleri's house is as much the inevitable result of tools, materials, and processes as is the log cabin. The peculiar viscosity of the desert sand where Soleri built his home made his unique method possible. Selecting a mound of desert sand, Soleri criss-crossed it with V-shaped channels cut into the sand, making a pattern somewhat like the ribs of a whale. Then he poured concrete in the channels, forming, when set, the roof-beams of the house-to-be. He added a concrete skin for the roof and bulldozed the sand out from underneath to create the living space itself. He then completed the structure by setting in car windows garnered from automobile junkyards. Soleri's creative use of tools, materials, and processes was a *tour de force* that gave us a radically new building method.

Dow Chemical's 'self-generating' styrofoam dome is the product of another radical approach to building methods. The foundation of the building can be a 12-inch-high circular retaining wall. To this wall a 4-inch wide strip of styrofoam is attached which raises as it goes around the wall from zero to 4 inches in height, forming the base for the spiral dome. On the ground in

Paolo Soleri: Carved earth form for the original drafting room and interior of the ceramics workshop. Photos by Stuart Weiner.

the centre, motorized equipment operates two spinning booms, one with an operator and the other holding a welding machine. The booms move around, somewhat like a compass drawing a circle, and they rise with a spiralling motion at about 30 feet a minute. Gradually they move in towards the centre. A man sitting in the saddle feeds an 'endless' 4 x 4-inch strip of styrofoam into the welding machine, which heat-welds it to the previously hand-laid styrofoam. As the feeding mechanism follows its circular, rising, but ever-diminishing diameter path, this spiral process creates the dome. Finally, a hole 36 inches in diameter is left in the top, through which man, mast, and movement arm can be removed. The hole is then closed with a clear plastic pop-in bubble or a vent. At this point the structure is translucent, soft, but still entirely without doors or windows. The doors and windows are then cut (with a minimum of effort; in fact the structure is still so soft that openings could be cut with one's fingernail), and the structure is sprayed inside and out with latex-modified concrete. The dome is ultralightweight, is secured to withstand high wind speeds and great snow loads, is vermin-proof, and inexpensive. Several of these 54-foot-diameter domes can be easily joined together into a cluster.

All these building methods demonstrate the elegance of solution possible with a creative interaction of tools, materials, and processes.

USE: 'Does it work?' A vitamin bottle should dispense pills singly. An ink bottle should not tip over. A plastic-film package covering sliced pastrami should withstand boiling water. As in any reasonably conducted home, alarm-clocks seldom travel through the air at speeds approaching five hundred miles per hour, 'streamlining' clocks is out of place. Will a cigarette lighter designed like the tail fin of an automobile (the design of that auto- mobile was copied from a pursuit plane of the Korean War) give more efficient service? Look at some hammers: they are all different in weight, material, and form. The sculptor's mallet is fully round, permitting constant rotation in the hand. The jeweller's chasing hammer is a precision instrument used for fine work on metal. The prospector's pick is delicately balanced to add to the swing of his arm when cracking rocks.

The ball-point pen with a fake polyethylene orchid surrounded by fake styrene carrot leaves sprouting out of its top, on the other hand, is a tawdry perversion of design for use.

But the results of the introduction of a new device are never predictable. In the case of the automobile, a fine irony developed. One of the earliest criticisms of the car was that, unlike 'old Dobbin', it didn't have the sense 'to find its way home' whenever its owner was incapacitated by an evening of genteel drinking. No one foresaw that mass acceptance of the car would put the American bedroom on wheels, offering everyone a new place to copulate (and privacy from supervision by parents and spouses). Nobody expected the car to accelerate our mobility, thereby creating the exurbant sprawl and the dormitory suburbs that strangle our larger cities; or to sanction the killing of fifty thousand people per annum, brutalising us and making it possible, as Philip Wylie says 'to see babies with their jaws ripped off on the corner of Maine and Maple'; or to dislocate our societal groupings, thus contributing to our alienation; and to put every yut, yahoo, and prickmouse from sixteen to sixty in permanent hock to the tune of \$80 a month. In the middle forties, no one foresaw that, with the primary use function of the automobile solved, it would emerge as a combination status symbol and disposable, chrome-plated codpiece. But two greater ironies were to follow. In the early sixties, when people began to fly more, and to rent standard cars at their destination, the businessman's clients no longer saw the car he owned and therefore could not judge his 'style of life' by it. Most of Detroit's Baroque exuberance subsided, and the automobile again came closer to being a transportation device. Money earmarked for status demonstration was now spent on boats, colour television sets, and other ephemera. The last irony is still to come: with carbon monoxide fumes poisoning our atmosphere, the electric car, driven at low speeds and with a cruising range of less than one hundred miles, reminiscent of the turn of the century, may soon make an anachronistic comeback. Anachronistic because the days of individual transportation devices are numbered.

The automobile gives us a typical case history of seventy years of the perversion of design for use.

NEED: Much recent design has satisfied only evanescent wants and desires, while the genuine needs of man have often been neglected by the designer. The economic, psychological, spiritual, technological, and intellectual needs of a human being are usually more difficult and less profitable to satisfy than the carefully engineered and manipulated 'wants' inculcated by fad and fashion.

People seem to prefer the ornate to the plain as they prefer day-dreaming to thinking and mysticism to rationalism. As they seek crowd pleasures and choose widely travelled roads rather than solitude and lonely paths, they seem to feel a sense of security in crowds and

crowdedness. *Horror vacui* is horror of inner as well as outer vacuum.

The need for security-through-identity has been perverted into role-playing. The consumer, unable or unwilling to live a strenuous life, can now act out the role by appearing caparisoned in Naugahyde boots, pseudo-military uniforms, voyageur's shirts, little fur jackets, and all the other outward trappings of Davy Crockett, Foreign Legionnaires, and Cossack Hetmans. (The apotheosis of the ridiculous: a 'be-your-own-Paul-Bunyan-kit, beard included', neglecting the fact that Paul Bunyan is the imaginary creature of an advertising firm early in this century.) The furry parkas and elk-hide boots are obviously only role-playing devices, since climatic control makes their real use redundant.

A short ten months after the Scott Paper Company introduced disposable paper dresses for QQC, it was possible to buy throwaway paper dresses ranging from \$20 to \$149.50. With increased consumption, the price of the 99c dress could have dropped to 40c. And a 40c paper dress is a good idea. Typically, industry perverted the idea and chose to ignore an important need-fulfilling function of the design: disposable dresses inexpensive enough to make disposability economically feasible for the consumer.

Greatly accelerated technological change has been used to create technological obsolescence. This year's product often incorporates enough technical changes to make it really superior to last year's offering. The economy of the market place, however, is still geared to a static philosophy of purchasing-owning' rather than a dynamic one of 'leasing-using', and price policy has not resulted in lowered consumer cost. If a television set, for instance, is to be an every-year affair, rather than a once-in-a-lifetime purchase, the price must reflect it. Instead, the real values of real things have been driven out by false values of false things, a sort of Gresham's Law of Design.

As an attitude, 'Let them eat cake' has been thought of as a manufacturer's basic right. And by now people, no longer 'turned on' by a loaf of bread, can differentiate only between frostings. Our profit-oriented and consumer-oriented Western society has become so over-specialised that few people experience the pleasures and benefits of full life, and many never participate in even the most modest forms of creative activity which might help to keep their sensory and intellectual faculties alive. Members of a 'civilised' community or nation depend on the hands, brains, and imaginations of experts. But however well trained these experts may be, unless they have a sense of ethical, intellectual, and artistic responsibility, then morality and an intelligent, 'beautiful', and elegant quality of life will suffer in astronomical proportions under our present-day system of mass production and private capital.

TELESIS: 'The deliberate, purposeful utilisation of the processes of nature and society to obtain particular goals' (American College Dictionary, 1961). The telesic content of a design must reflect the times and conditions that have given rise to it, and must fit in with the general human socio-economic order in which it is to operate.

The uncertainties and the new and complex pressures in our society make many people feel that the most logical way to regain lost values is to go out and buy Early American furniture, put a hooked rug on the floor, buy ready-made phoney ancestor portraits, and hang a flint-lock rifle over the fireplace. The gas-light so popular in our subdivisions is a dangerous and senseless anachronism that only reflects an insecure striving for the 'good old days' by consumer and designer alike.

Our twenty-year love affair with things Japanese - Zen Buddhism, the architecture of the Ise Shrine and Katsura Imperial Palace, haiku



poetry, Hiroshige and Hokusai block-prints, the music of koto and samisen, lanterns and sake sets, green tea liqueur and sukiyaki and tempura - has triggered an intemperate demand by consumers who disregard teleptic aptness. By now it is obvious that our interest in things Japanese is not just a passing fad or fashion but rather the result of a major cultural confrontation. As Japan was shut off for nearly two hundred years from the Western world under the Tokugawa Shogunate, its cultural expressions flourished in a pure (although somewhat inbred) form in the imperial cities of Kyoto and Edo (now Tokyo). The Western world's response to an in-depth knowledge of things Japanese is comparable only to the European reaction to things classical, which we are now pleased to call the Renaissance. Nonetheless, it is not possible to translate things from one culture to another.

The floors of traditional Japanese homes are covered by floor mats. These mats are 3x6 feet in size and consist of rice straw closely packed inside a cover of woven rush. The long sides are bound with black linen tape. While tatami mats impose a module (homes are spoken of as six-, eight-, or twelve-mat homes), their primary purposes are to absorb sounds and to act as a sort of wall-to-wall vacuum cleaner which filters particles of dirt through the woven surface and retains them in the inner core of rice straw. Periodically these mats (and the dirt within them) are discarded, and new ones are installed. Japanese feet encased in clean, sock-like tabi (the sandal-like street shoe, or geta, having been left at the door) are also designed to fit in with this system. Western-style leather-soled shoes and spike heels would destroy the surface of the mats and also carry much more dirt into the house. The increasing use of regular shoes and industrial precipitation make the use of tatami difficult enough in Japan and absolutely ridiculous in the United States, where high cost makes periodic disposal and reinstallation ruinously expensive.

But a tatami-covered floor is only part of the larger design system of the Japanese house. Fragile, sliding paper walls and tatami give the house definite and significant acoustical properties that have influenced the design and development of musical instruments and even the melodic structure of Japanese speech, poetry, and drama. A piano, designed for the reverberating insulated walls and floors of Western homes and concert halls, cannot be introduced into a Japanese home without reducing the brilliance of a Rachmaninoff concerto to a shrill cacophony. Similarly, the fragile quality of a Japanese samisen cannot be fully appreciated in the reverberating box that constitutes the American house. Americans who try to couple a Japanese interior with an American living experience in their search for exotica find that elements cannot be ripped out of their teleptic context with impunity.

ASSOCIATION: Our psychological conditioning, often going back to earliest childhood memories, comes into play and pre-disposes us, or provides us with antipathy against a given value. Increased consumer resistance in many product areas testifies to design neglect of the associational aspect of the function complex. After two decades, the television-set industry, for instance, has not yet resolved the question of whether a television set should carry the associational values of a piece of furniture (a lacquered mah-jongg chest of the Ming Dynasty) or of technical equipment (a portable tube tester). Television receivers that carry new associations (sets for children's rooms in bright colours and materials, enhanced by tactilely pleasant but non-working controls and pre-set for given times and channels, clip-on swivel sets for hospital beds, etc., etc.) might not only clear up the astoundingly large back inventory of sets in warehouses, but also create new markets.

And what shape is most appropriate to a vitamin bottle: a candy jar of the Gay Nineties, a perfume bottle, or a 'Danish modern' style salt shaker ?

The response of many designers has been like that so unsuccessfully practised by Hollywood: the public has been pictured as totally unsophisticated, possessed of neither taste nor discrimination. A picture emerges of a moral weakling with an IQ of about 70, ready to accept whatever specious values the unholy trinity of Motivation Research, Market Analysis, and Sales have decided is good for him. In short, the associational values of design have degenerated to the lowest common denominator, determined more by inspired guesswork and piebald graphic charts rather than by the genuinely felt wants of the consumer.

Many products already successfully embody values of high associational content, either accidentally or 'by design'.

The Sucaryl bottle by Raymond Loewy Associates for Abbott Laboratories communicates both table elegance and sweetening agent without any suggestion of being medicine-like. The Lettera 22 portable typewriter by Olivetti establishes an immediate aura of refined elegance, precision, extreme portability, and businesslike efficiency, while its two-toned carrying case of canvas and leather connotes 'all-weather-proof'.

Abstract values can be communicated directly to everyone, and this can be simply demonstrated.

If the reader is asked to choose which one of the figures below he would rather call Takete or Maluma (both are words devoid of all meaning in any known language), he will easily call the one on the right Takete (W. Koehler, Gestalt Psychology),

Many associational values are really universal, providing for unconscious, deep-seated drives and compulsions. Even totally meaningless sounds and shapes can, as demonstrated, mean the same thing to all of us. The unconscious relationship between spectator expectation and the configuration of the object can be experimented with and manipulated. This will not only enhance the 'chair-ness' of a chair, for instance, but also load it with associational values of, say, elegance, formality, portability, or what-have-you.

**AESTHETICS:** Here dwells the traditionally bearded artist, mythological figure, equipped with sandals, mistress, garret, and easel, pursuing his dream-shrouded designs. The cloud of mystery surrounding aesthetics can (and should be) dispelled. The dictionary definition, 'a theory of the beautiful, in taste and Art' leaves us not much better off than before. Nonetheless we know that aesthetics is a tool, one of the most important ones in the repertory of the designer, a tool that helps in shaping his forms and colours into entities that move us, please us, and are beautiful, exciting, filled with delight, meaningful.

Because there is no ready yardstick for the analysis of aesthetics, it is simply considered to be a personal expression fraught with mystery and surrounded with nonsense. We 'know what we like' or dislike and let it go at that. Artists themselves begin to look at their productions as auto-therapeutic devices of self-expression, confuse licence and liberty, and forsake all discipline. They are often unable to agree on the various elements and attributes of design aesthetics. If we contrast the 'Last Supper' by Leonardo da Vinci with an ordinary piece of wallboard, we will understand how both operate in the area of aesthetics. In the work of so-called 'pure' art, the main job is to operate on a level of inspiration, delight, beauty, catharsis ... in short, to serve as a propagandistic communications device for the Holy Church at a time when a largely pre-literate population was exposed to a few non-verbal stimuli. But the 'Last Supper' also had to fill the other requirements of function; aside from the spiritual, its use was to cover a wall. In terms of method it had to reflect the material (pigment and vehicle), tools (brushes and painting knives), and processes (individualistic brushwork) employed by Leonardo. It had to fulfil the human need for spiritual

satisfaction. And it had to work on the associational and telesic plane, providing reference points from the Bible. Finally, it had to make 30 identification through association easier for the beholder through such clichés as the racial type, garb, and posture of the Saviour. 'The Last Supper', by Leonardo da Vinci. Earlier 'Last Supper' versions, painted during the sixth and seventh centuries, saw Christ lying or reclining in the place of honour. For nearly a thousand years, the well-mannered did not sit at the table. Leonardo da Vinci disregarded the reclining position followed by earlier civilisations and painters for Jesus and the Disciples. To make the 'Last Supper' acceptable to Italians of his time, on an associational plane, Leonardo sat the crowd around the last supper table on chairs or benches in the proper positions of his (Leonardo's) time. Unfortunately the scriptural account of St John resting his head on the Saviour's bosom presented an unsolvable positioning problem to the artist, once everybody was seated according to the Renaissance custom. On the other hand, the primary use of wallboard is to cover a wall. But an increased choice of textures and colours applied by the factory shows that it, too, must fulfil the aesthetic aspect of function. No one argues that in a great work of art such as the 'Last Supper', prime functional emphasis is aesthetic, with use (to cover a wall) subsidiary. The main job of wallboard is its use in covering a wall, and the aesthetic assumes a highly subsidiary position. But both examples must operate in all six areas of the function complex. Designers often attempt to go beyond the primary functional requirements of method, use, need, telesic, association, and aesthetics; they strive for a more concise statement: precision, simplicity. In a statement so conceived, we find a degree of aesthetic satisfaction comparable to that found in the logarithmic spiral of a chambered nautilus, the ease of a seagull's flight, the strength of a gnarled tree trunk, the colour of a sunset. The particular satisfaction derived from the simplicity of a thing can be called elegance. When we speak of an 'elegant' solution, we refer to something consciously evolved by men which reduces the complex to the simple:

Euclid's Proof that the number of primes is infinite, from the field of mathematics, will serve: 'Primes' are numbers which are not divisible, like 3, 17, 23, etc. One would imagine as we get higher in the numerical series, primes would get rarer, crowded out by the ever-increasing products of small numbers, and that we would finally arrive at a very high number which would be the highest prime, the last numerical virgin.

Euclid's Proof demonstrates in a simple and elegant way that this is not true and that to whatever astronomical regions we ascend, we shall always find numbers which are not the product of smaller ones but are generated by immaculate conceptions, as it were. Here is the proof: assume that P is the hypothetically highest prime; then imagine a number equal to  $1 \times 2 \times 3 \times 4 \dots \times P$ . This number is expressed by the numerical symbol (P!). Now add to it 1: (P! + 1). This number is obviously not divisible by P or any number less than P (because they are all contained in (P!)); hence (P! + 1) is either a prime higher than P or it contains a prime factor higher than P . . . Q.E.D.

The deep satisfaction evoked by this proof is aesthetic as well as intellectual: a type of enchantment with the near-perfect.

## **PHYLOGENOCIDE:**

### **A History of the Industrial Design Profession**

We are all in the gutter, but some of us are looking at the stars.

## OSCAR WILDE

The ultimate job of design is to transform man's environment and tools and, by extension, man himself. Man has always tried to change himself and his surroundings, but only recently have science, technology, and mass production made this more nearly possible. We are beginning to be able to define and isolate problems, to determine possible goals and work meaningfully towards them. And an over-technologized, sterile, and inhuman environment has become one possible future; a world choking under a permanent, dun-coloured pollution umbrella, another. In addition the various sciences and technologies have become woefully compartmentalised and specialised. Often, more complex problems can be attacked only by teams of specialists, who often speak only their own professional jargon. Industrial designers, who are often members of such a team, frequently find that, besides fulfilling their normal design function, they must act as a communication bridge between other team members. Frequently the designer may be the only one who speaks the various technical jargons. Because of his educational background, the role of team interpreter is often forced upon him. So we find the industrial designer in a team situation becoming the 'team synthesist', a position to which he has been elevated only by the default of people from all the other disciplines.

This has not always been true.

Many books on industrial design suggest that design began when man began making tools. While the difference between *Australopithecus africanus* and the modern designer may not be as great as one might think or hope for, the stance of equating man the toolmaker with the start of the profession is just an attempt to gain status for the profession by evoking a specious historical precedent. 'In the beginning was Design': obviously, but not industrial design. Henry Dreyfuss, one of the founders of the profession, says in *Designing for People* (probably the best and most characteristic book about industrial design):

The Industrial Designer began by eliminating excess decoration, his real job began when he insisted on dissecting the product, seeing what made it tick, and devising means of making it tick better - then making it look better. He never forgets that beauty is only skin-deep. For years in our office we have kept before us the concept that what we are working on is going to be ridden in, sat upon, looked at, talked into, activated, operated, or in some way used by people individually or en masse. If the point of contact between the product and the people becomes a point of friction, then the Industrial Designer has failed. If, on the other hand, people are made safer, more comfortable, more eager to purchase, more efficient - or just plain happier - the designer has succeeded. He brings to this task a detached, analytical point of view. He consults closely with the manufacturer, the manufacturer's engineers, production men, and sales staff, keeping in mind whatever peculiar problems the firm may have in the business or industrial world. He will compromise up to a point but he refuses to budge on design principles he knows to be sound. Occasionally he may lose a client, but he rarely loses the client's respect.

Industrial design, then, is always related to production and/or manufacturing facilities, a state of affairs enjoyed by neither man nor the Deity. The first concern with the design of tools and machinery coincided almost exactly with the beginnings of the Industrial Revolution and, appropriately enough, made its first appearance in England. The first industrial design society was formed in Sweden in 1849, to be followed shortly by similar associations in Austria, Germany, Denmark, England, Norway, and Finland (in that order). The designers of the period were concerned with form-giving, an erratic search for 'appropriate beauty' in machine tools and machine-made objects. Looking at the machine, they saw a new thing, a thing that seemed to cry out for decorative embellishments. These decorations were usually garnered from