J. Gordon Lippincott

Design for Business

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Donald R. Dohner has been recagnized as an outstanding educator and pioneer in Industrial Design. He combined scope with vision to give the professian stature. His deep understanding of human nature has malded the character and talents of many younger designers of our day. Withaut him this book could not have been written.

J. Gordon Lippincott

Design for Business

Paul Theobald, Chicago, 1947

Contents

This Era of Change

The twentieth century is the first period of recorded history in which huge masses of the population have come to accept change as natural and desirable. In ages past, men have spent more time preparing for immortality than improving on their surroundings; they have expended more effort erecting magnificent monuments and cathedrals than building the humble structures of daily living. Their immediate environment remained relatively the same from generation unto generation.

But today the old proverb, "Nothing is sure but death and taxes," should read: "Nothing is sure but death, taxes and *change*." Change is fast making obsolete nearly everything we think and use. Even our cities are obsolescent. They are crazily congested, and their dark, airless cells of masonry and stone offend against the modern realization that health is an asset far greater than wealth.

There is actually no longer any reason for a city. The press and radio have made the printed and spoken word equally available to country dwellers. Television is carrying visual participation in current events to ever-widening circles of rural communities. With the coming of microfilm, the amount of recorded knowledge now stored in the New York Public Library can easily be housed in the library of the smallest village.

All American cities are going through a dynamic period of change. The current decentralization of industry is part of the trend. Before long, blocks of empty stores and millions of dollars in tax delinquencies will plague our larger cities. There is no easy solution to this problem.

And at the same time, across the oceans to east and west of us, gutted walls and piles of twisted steel are grim reminders of the fact that cities are no longer havens of protection in war.

Change has been greatly stimulated by World War II, for *this* war was in truth a war of research. It was won by the nations who through research, supplied their armies in the field with the most efficient weapons in the greatest numbers. Two primary lessons of World War II will further accent this age of change. First, we now know we nearly equalled the production of all the rest of the world combined. This in itself was remarkable, but more remarkable was the fact that we accomplished this during the war with 10,000,000 of our finest manpower in the armed services. Ditch diggers, gasoline station attendants and other unskilled workers were trained in the precision manufacture and assembly of close-tolerance parts in a matter of weeks. Production line operators were recruited from the blind, the lame and the halt. In short, we discovered that a few truly talented executives, engineers and labor leaders could design products, set up the assembly lines and simplify the operations to the point where mere manpower could produce the results desired. Only one person in a hundred had to be truly creative and ingenious, and through his guidance the other ninety-nine *produced.*

The second lesson of World War II was the significant power — yes, the amazing power — of intensive research. Into a four-year period we have packed probably twenty years of normal scientific progress. Research is the lifeblood of industry. The war has made it axiomatic that keen *research* pays handsome dividends!

The war also furthered the trend in the substitution of power machine tools for human labor—resulting in mass production on a scale never before even imagined. The result is that today — and it is being accented by labor troubles — industry prefers spending greater and greater amounts for tooling and capital investment and less and less for direct human labor per unit of manufacture. The final result will quite probably be a reduction in the hours of work per week for our population, without lowering their living standards one iota.

These trends will greatly increase the leisure time of our whole population. They will mean new markets for the American manufacturer. Private planes, trailers, boats, automobiles, camera equipment and all other hobby needs are due for substantial production increases. A return to the nearly-forgotten pleasures of outdoor living brought about by this greater leisure and decentralization of the city will also result in new styles in clothing— new concepts of architecture for our homes.

Actually, we have become so used to change that as a nation we take it for granted. The American consumer *expects* new and better products every year. He has become accustomed to the yearly automobile show--to national advertising announcing new models. His acceptance of change toward better living is indeed the American's greatest asset. It is the prime mover of our national wealth. It should be realized that change has *momentum,* and it has *mass.* It takes a long time to get mass acceptance of change in motion, but once in motion, as it most assuredly is now, it will keep rolling for the foreseeable future.

Right now we are living in a period of tremendously *accelerated* mass acceptance of this new concept. The American executive must be actively aware of these trends because they affect the entire future of his business. No longer is the success of certain methods of operation in the past a guarantee of their success in the future. We are now entering a phase of competition in American industry which can be likened only to Darwin's theory of the survival of the fittest. Those industries which will recognize this dynamic era of change and growth, and plan accordingly, may look forward to a lively future. Those which choose to tread the paths of tradition will find themselves slowly but surely outdistanced by their more alert competitors.

Because this concept of change is so simple, it takes on the aspect of the profound. It is interesting to hazard a guess as to when and why it started. It has, I believe, started because of the amazingly increased production per capita now possible since the power machine tool has been applied to mass production. This means that for the first time in history populations need not be controlled by war, famine and disease. Is it a wonder that, as a people, we are now more interested in life than in death—in building for progressive living rather than erecting monuments to yesterday? While it is always hard to define turning points in history, I feel that the man who was truly outstanding in stimulating this new era of mass production was Henry Ford. His voluntary raising of wages, combined with research to increase production, resulted in higher wages and better living standards, first for those in the automotive industry and later for workers throughout the entire United States. A mass production never before imagined came into being. Since one job in seven in this country is now either in or dependent upon the automotive industry, one can see that Mr. Ford's first concepts of mass production were truly revolutionary. He realized that *volume* is the key to mass production, since tooling investment and research costs must be amortized. The striving of the automotive industry for higher and higher volume brought about new concepts of advertising, merchandising and mass distribution which in turn were copied by most of the other American industries. The automobile also deserves

The modern home emphasizes simplicity combined with fine and sensitive decoration. The bedroom below is not a spectacular, modern room that can be afforded only by the wealthy but rather a livable design available to the lowest income groups. The built-in wardrobe with its own lighting costs no more than conventional furniture.

Many readers will remember bathrooms of 40 years ago with a twinge of nostalgia — but they would not go back to primitive discomforts. There is no doubt that our most advanced bathrooms of today will look as completely obsolete 40 years from now.

the lion's share of credit for creating the new profession of industrial design as the means of stimulating greater sales *volume* through applied art and style.

These concepts as established by Henry Ford and amplified by all branches of American industry are only about 30 years old! In other words, throughout the thousands and thousands of years of recorded human history, only in the past 30 years has this idea of steady *change toward better living* been noticeable. Actually, it is still developing — is still in an embryonic stage. A visitor to the United States 50 years from now will not find our large cities looking at all the way they do today. There will be greater changes in New York City between now and *1990* than there were between now and *1890*. Because the acceleration of change is on the increase, we are entering a period where we will accept an economy of abundance rather than an economy of scarcity. We will develop new ideas of saving and spending — new concepts of money. After all, with our advances in mass production, architecture, clothing, color — indeed, with every phase of human thinking and living changing so rapidly — is it surprising that our appreciation of money should also change? We are certainly entering an era

where the mere accumulation of wealth, as such, is becoming less and less an individual or national objective.

These elements of change are so all-encompassing, so profound, and proceed at such a pace that it is indeed difficult for any business executive to have a basic perspective of his business or of his own living experience. Certainly, however, he can enter this new era far better armed if he accepts the following axiom of our new life — *Every operation of management should be re-examined in the light of CERTAIN CHANGE and the direction of this change should be anticipated and planned for.*

Because of rapid change our planning, where large amounts of capital investment are required, should be based on rapid amortization. Take, for example, hotels, office buildings, airports, stores, theatres — all these are becoming obsolete at a far faster rate than ever before. Their planning, therefore, should be highly flexible, and of modular materials of high salvage value. Railroad rolling stock, machine tools and the means of production and distribution are going through extremely rapid and revolutionary changes. It does not pay to run obsolete equipment in competition with new and better equipment. Had the American railroads financed themselves in anticipation of rapid change 30 or 40 years ago, they would not be in the difficulties they are in today. The air-transport industry today is moving far more rapidly than the railroads ever did, and accordingly, capital investment should be made with serious and greater foresight.

In an era of change, there is a mass seeking for security as an end in itself—both corporate and individual. This desire for security is resistance to the unknown—to change. Security as a mass goal breeds regimentation and bureaucracy. It is the very opposite of the individualism and creativeness that have made America great.

This era of change is here. It is in dynamic motion. We cannot hedge from it or build up false walls of defense called "security." The only real security for individuals, corporations or nations is enterprise, vision and adaptability to changing environment.

In this coming period the population will feel a greater need for qualities that do not change — the need for security, for the home, for love and children and religion. These points of solidarity will be needed for growth even as lighthouses are needed in charting the course of a ship. Individual and national morals will improve because in an era of material change in living, only spiritual qualities can remain fixed, and as a result will be held in ever greater value.

Obsolescence —

The Keynote of a New Prosperity

We all know that American industry has the finest plant equipment, machine tools and "know how" ever seen in history. We also have the skilled workers to utilize this equipment and the mass population to consume the products of the labor. The major problem confronting us is how to *move this merchandise to the American consumer.* The major problem therefore is one of stimulating the urge to buy!

Through advertising, a superb job has been done in building and increasing the market for manufactured goods. This has been done so well that we, as a nation, expect better products and more value for our money. This is favorable public psychology. It means that any *really good product* will find a tremendous market. The real problem will be to keep the wheels of industry moving *after* the market has become saturated.

Any method that can motivate the flow of merchandise to new buyers will create jobs and work for industry, and hence national prosperity. Indeed, this is the one great means of providing better merchandise and housing for the least prosperous third of our population. Surely in no other country in the world can a worker earning $45 a week drive to his job in his own automobile. He enjoys this privilege only because of the aggressive selling methods of the American automotive industry. Were our housing industry as alert and aggressive, he would be living in a far better home. Were his local politicians as well guided, he would be enjoying the fruits of improved city planning plus lower taxes.

Our custom of trading in our automobiles every year, of having a new refrigerator, vacuum cleaner or electric iron every three or four years is economically sound. Our willingness to part with something *before* it is completely worn out is a phenomenon noticeable in no other society in history. It is truly an American habit, and it is soundly based on our economy of abundance. It must be further nurtured even though it *is* contrary

to one of the oldest inbred laws of humanity — the law of thrift — of providing for the unknown and often-feared day of scarcity.

Many writers have deplored the fact that national advertising and styling have forced these habits upon us. Even such an eminent and modern thinker as Louis Mumford has said: "It would be, of course, a foolish waste to purposely design buildings which would collapse in 15 years so they could be renewed; a perversion just as foolish as the modern one of fashioning a motor car to go out of style in five years in order merely to increase the demand for production and profit." Mr. Mumford has made a poor analogy. A building that after 15 years collapses like the famous old one-horse shay would be a complete loss after that time, since the labor in salvage would about equal the value of the obsolete material. Entirely different is the case of the automobile. When an automobile becomes style-obsolete it

Style obsolescence and mechanical obsolescence proceed hand in hand. Who would have thought this early victrola was the forerunner of today's tremendous recording industry?

moves down the line to the second-hand car buyer and *continues a useful life* until it finally hits the graveyard and becomes scrap metal for re-use in industry. I insist it does not matter whether it becomes junk in the hands of the second owner or the fifth or sixth owner down the line; the important point is that, *if* the original owner used this car for its full life of 15 years *there would be no car* for that fifth or sixth owner.

American industry, enjoying high mass production and stimulated by keen competition, has given the American consumer his greatest value for the dollar. After all, the average American car sells for 50¢ a pound, approximately the cost of a good beefsteak! Give these industries still greater *volume* and the economies of mass production will force prices steadily downward to the great advantage of the American consumer. Let it be noted however that volume can be achieved only through the buying of *new* equipment, which means of course that used equipment must move steadily down the line, since in normal times most purchasers of new appliances, automobiles and homes are those who already own similar products at the time of purchase. The method capable of *stimulating* this flow of merchandise is the key to our future prosperity.

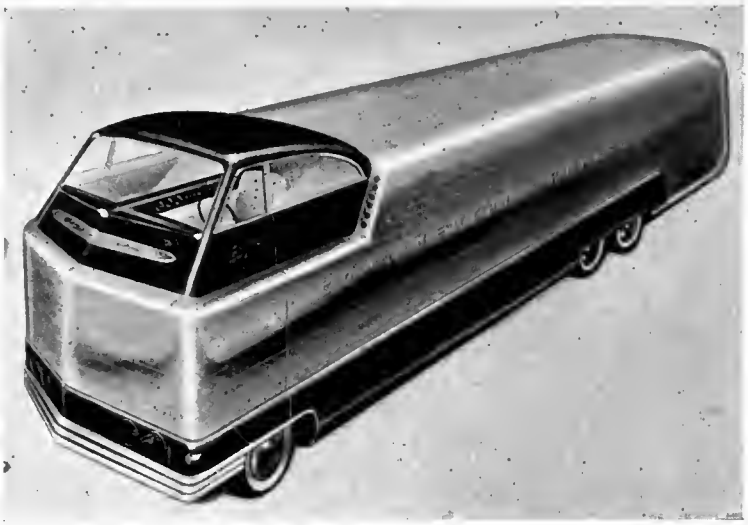
The outstanding factor in such stimulation is a mass buying-psychosis. This we have always experienced during years of prosperity. The prime job that national advertising, research, and the industrial designer are doing in common is the breaking down of *new sales* resistance to accelerate the flow of goods and services. This is chiefly mental conditioning — largely a job of convincing the consumer that he *needs* a new product before his old one is worn out. It is a case of bucking age-old habits of thrift, and incidentally and naturally is stirring up intense controversy among the old-timers who exclaim: "What is this world coming to? Is the idea of thrift all wrong? Is money in the savings bank doing less good than the same money spent in purchasing a new washing machine?" These are points active in the realm of the economist and beyond the authority of the industrial designer. Does it not seem common sense, however, that only great national production of goods and services, absorbed and used by all levels of our population, can result in true national prosperity under a capitalist system? In a nation based on free enterprise, the only way to move merchandise steadily out to the consumer is to make him *want to buy it himself,* and this can be done only through large-scale national advertising combined with sales appeal in the better products attained through research.

Why the Industrial Designer

Today as never before the consumer is *design*-conscious, and the appearance of a product has become an integral feature in its success or failure. Hence the growing need for attention to style, which now plays an equally important part with engineering in the building of a successful product.

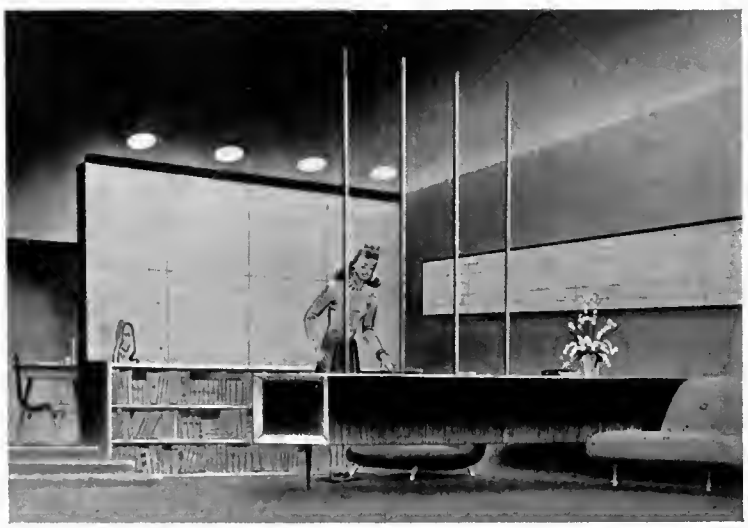
This is a departure from past experience, for until the last two decades the primary merits of most commodities were predicated on function and price. Industry has now begun to realize that beauty has a sales value and that along with such aspects as convenience, utility and simplicity, it must be considered in all products—machinery not excluded.

This is where industrial designing, which began its specialized function in the late twenties, enters the picture. *It is the work of the industrial designer to create the right form for the manufactured article. Through his knowledge of applied art, he correlates utility with esthetic appeal and thereby seeks to imbue the consumer with the desire of ownership.*



Style applied to trucks can increase operator comfort, efficiency and prestige for the operating company. Note that rectilinear form has been maintained in the storage areas, for maximum capacity.

Glamour is an important part of sales appeal. This molded lucite display case for jewelry provides a rich setting that invites impulse buying.



Style reaches into our homes of tomorrow. Living will be organically planned for greater leisure and comfort. Style is a means of moving all merchandise designed for the home.

The industrial designer styles what his experienced judgment tells him is a product the public will want to buy and possess, though this may not always be what he thinks is good looking nor again something he would like in his own home. His main objective is to create an article of strong sales appeal, and he achieves his end only through the understanding of style trends. Such trends represent the contemporary drift of consumer acceptance. They derive their power from our tendency to imitate—the herd instinct in man. Innumerable factors ranging from the strictly rational to the completely emotional enter into this formulation of the current mode. However, once crystallized into the accepted thing, it becomes a mass goal for the consumer. At one time style was used mainly in the merchandising of women's wear, but today it applies almost as forcefully to such basic items as refrigerators, automobiles, radios, dishwashers, airplanes, telephones, toasters, furniture, interiors and packaged products.

Since the industrial designer is a consultant from the outside, he serves as a prime integrator within any organization. His opinions are unbiased and objective, beyond the political structure which is bound to be part of any organization whether large or small. It is the designer's job to correlate the findings of consumer research and marketing with those of the sales force and to design visually products that may be interpreted intelligently by the engineering staff. The result should be a product that has not only genuine sales appeal but also is capable of being manufactured at a competitive price with the equipment possessed by the plant.

It is an axiom of our present day economy that *one cannot have mass production without mass consumption.* This statement is so basic that it has often been overlooked. A product that is styled so many years ahead of consumer tastes that it does not receive full mass acceptance is as badly designed as one which lags behind. As a matter of fact, if there is one main distinction between the fine and applied arts, it is this respect for contemporary consumer taste. In the fine arts, the artist may paint or sculpture very much as he pleases, with few or no limitations. In industrial design, however, the article must be designed not to suit the idea of the artist, but rather to appeal to the greatest number of buyers. In brief, the industrial designer *styles for sales.*

The *early* industrial designer brought art to industry. He improved product appearance greatly, but he also produced articles which either could not be manufactured economically or were esthetically so far above the heads of average consumers that they still bought the old "borax" by preference.

There have been many examples of overshooting in style. The Chrysler Airflow is classic. This model, (see photograph on Page 46), first brought out in 1934, was a superbly engineered automobile styled ten years ahead of its time. Although this same car, with modifications, could go on the market today and sell successfully, it went beyond the average consumer's concept of what an automobile should be then. Acceptance was so poor that no motor car manufacturer since has dared to get far ahead of the industry in appealing to buyers' tastes. The result has been that all automobiles look more or less alike in over-all contour and appearance, and the yearly style changes are paced carefully to correspond with current standards in consumer acceptance. This does not indicate a lack of enterprise on the part of the automobile industry but, rather, the costliness of any mistake in anticipating style acceptance. An automobile manufacturer has so tremendous an investment in engineering, tooling, dies, plant equipment, overhead, advertising and selling expense that *he cannot afford to be wrong.* The result is a conservative attitude and caution in style change. It would be a very rash industrial designer who would recommend otherwise.

Thus we see that a most important element for the consideration of the industrial designer is *sales.* There is only one reason for hiring an industrial designer, and that is to increase the sales of a product. An industrial designer who does not realize or admit this fact cannot truly perform a service for his client, painful though such realization may be to the expert alert to trends in modern art and possessed of fine personal tastes.

The wise industrial designer, serving the aims of his client, will style just a bit ahead of the market, if the client is alert and aggressive. But if the client is conservative and wants to stay so, the designer will style with moderation. In no case, however, will he design a product so far ahead of public taste and acceptance that sales will suffer.

It is important to realize that the industrial designer is serving industry and, indeed, society as a whole through stimulating the consumer purchase of goods. He can never adequately fulfill this function by mere styling to his own taste. Proof of this fact is that most of the products exhibited as examples of industrial design by the Museum of Modern Art and the Metropolitan Museum in New York *have never enjoyed wide sales and consumer acceptance.* This is not surprising. The *average* New Yorker would rather go to Roxy's movie palace than browse through the Museum of Modern Art. This is no reflection on either — they both serve a human need and function. American standards in consumer taste rise slowly, but there is no doubt that they *are* rising, and that the industrial designer is

making a very important contribution in this respect. *It is important to remember, however, that there are no rich patrons supporting industry, as is the case with museums,* and therefore industry will have to pay for its own art as it grows. The industrial designer must of necessity work within this economic framework.

It should be pointed out that our museums are serving a great function in showing what is *truly* fine in the applied arts, because there is always need of an unbiased source of guidance and inspiration to demonstrate what can be done. The Museum of Modern Art in New York is outstanding in this respect and has done an excellent job. But no product, however well its esthetic functions are fulfilled, may be termed a good example of industrial design unless it meets the acid test of high sales through public acceptance. *Good industrial design means mass acceptance.* No matter how beautiful a product may be, if it does not meet this test, the designer has failed of his purpose.

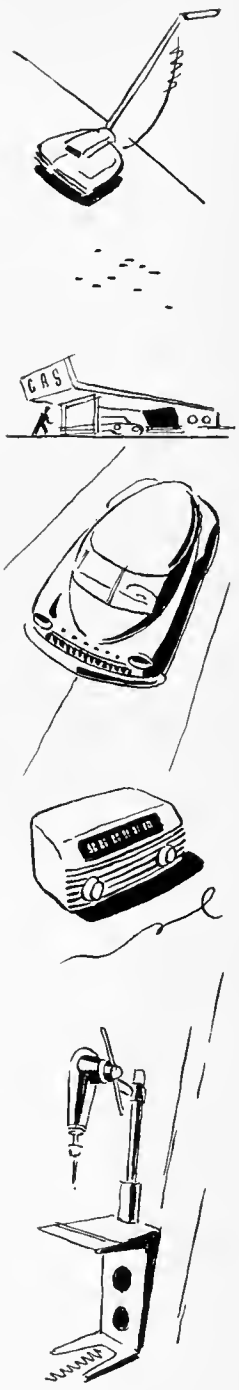
These statements may bring a cry of violent objection from the purists who will feel that the designer is prostituting his art. Yet as long as the designer hopes to be employed by industry and to grow as a part of it, he must design within the gradually rising but nonetheless limited scope of public acceptance.

Thus we see that the industrial designer is primarily a person who has his finger on the pulse of consumer acceptance. He knows what the public wants to buy, how they buy, what they can afford to pay. He is a forecaster of style trend; indeed, if truly creative, a leader of it. He has an appreciation of basic art principles and knows how to apply them with materials at hand and with manufacturing facilities available. And so he fashions a product, improved in function and appearance, which meets the current requirements of consumer tastes.

It is of interest to note that we are now in an era of unparalleled scientific advance. Our knowledge has grown more in the last thirty years than in all previously recorded history. It is natural to assume, therefore, that there must be awakenings in new art forms, in art consciousness throughout the world. We are no longer looking to the past for our inspiration. Modern art is here in both the fine and the applied arts.

In this book, we are concerned with industrial design — an applied art. This is an art which not only should enhance the beauty of everyday living but should also increase the functional usefulness of the object to which it is applied.

It is not surprising that the arts and sciences go together. Both are



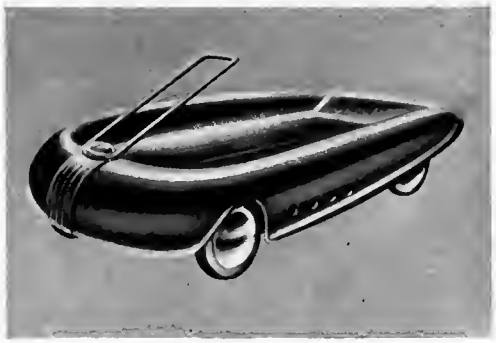
the result of creative thinking. The urge that will cause a scientist to spend many months developing circuits for a walky-talky radio is parallel to the driving efforts of a designer to find new ideas and ways of improving the function and appearance of a vacuum cleaner, or indeed, of an artist striving to express a new art on canvas. *All have common ground in creativeness, for if there is any one great thing which our culture has attained, it is an intensity in creativeness outdistancing all past eras.*

This being so, we have the right to assume that we are living in a period which is molding *new basic art forms* — as the tradition and eclecticism of the past are fading. We Americans are leaders in the sciences and likewise we are becoming leaders in the arts. We are no longer looking to Europe for cultural guidance in the arts but are boldly striking out with our own ideas. Nowhere is this truer than in industrial design. As a matter of fact, here in America we have the only country in the world where the industrial designer really exists.

One of the great contributions that our scientific progress has made to art is the development of new materials capable of art expression. For example, today all colors are less fugitive in sunlight, and their available range is wider than ever before. Our knowledge of pigments and dyes,

Steuben Glass, Inc.

Our economy of abundance means that all Americans can afford small luxuries. We are coming to an era when modern design will provide greater richness in ornamentation, more graciousness in expression, and an environment for living.



This express wagon of low-pressure molded plywood is now possible because of war-born techniques; an example of how advances in technology can influence style.

Even as functional an article as a husky forged wrench may be styled for greater sales appeal without increasing the manufacturing cost.

synthetic resins and enamels, means that we are entering a new era of color. Twenty years ago, nine cars out of ten were black, because that was the only practical color for a car. In the years to come it is likely that nine cars out of ten will be any color *but* black. This has been possible only because pigments that are not fugitive have been developed. While some colors are today more fugitive than others, all colors are far superior to those of a few years ago. This scientific achievement in capturing color has greatly stimulated the designers of automobiles, and the public at the same time has broadened its base of acceptance.

This parallel may be carried through the dyeing of textiles, the printer's ink on the pages of your magazine, the dyes used in technicolor film, and all other applications where color is involved. *Because of these scientific advances, we are entering a new era of color.* This will undoubtedly be reflected in more colorful clothing, and will influence and stimulate every phase of our lives and every kind of equipment used in our living.

Likewise, we could point out an unending list of new materials for new art expression. *Whenever mankind fashions or fabricates a material medium, art enters into the expression.* Thus the new synthetic plastics, new papers, new types of wood and metal all become new tools in the hands of the artist. Never in the past has the artist had so many media with which to express his creation.

If you will now take these many new media and add one further element — *mass production* — you will find that each art expression may be multiplied many, many thousands of times. For example, the theatre is one of man's most ancient art expressions, and today, because of sound on film in color, the art of the theatre may be duplicated in many film prints. It is difficult to imagine any medium available to man in the past as open to sheer fantasy as the color cartoons brought to life by Walt Disney. Here we have all the elements of visual art, including line, color, motion, as well as the suspense of drama in which music plays an important part — plus no limitations whatever on the imagination, whether the scene be laid around the corner or in some remote spot on Mars.

The fact that most of our cartoon movies leave much to be desired is no fault of the medium. It means that we have not developed enough creative artists who have kept pace with the advancement of these technologies. I think all will admit that this is a new and wondrous art medium for man's expression. So far the surface has only been scratched. It is typical of the tremendous challenge facing the artist of today who suddenly and often finds himself completely surrounded with new possibilities for expressing his ideas and making them available to millions.

In concluding this chapter, it should be pointed out that industrial design should always be written off as *research,* never as an advertising or a promotional investment. Like research, it should continue year after year because, with today's competition and changing style trends in consumer tastes, research for product betterment is never-ending. Industrial design straddles both types of research — *industrial* and *consumer.* The industrial designer is concerned with all phases of mass production, from the conception of a product idea, through styling and engineering to mass production and mass distribution, and past the ultimate sale on the dealer's counter to actual use by a satisfied customer. Research is necessary to guide the creative planning of a product of maximum consumer acceptance, which can be put on the market at a competitive price. In the past, most manufacturers have called in industrial designers only after competition had made their product style-obsolete. It must be realized that in order to keep a line of products continuously at the top of competition, the design studies and research must also be *continuous.* It is not enough to design a good-looking product and then wait five or ten years, until that product is obsolete, before thinking about re-designing it. *Design is a living, growing thing that requires continuous thought and study.*

How the Industrial Designer Influences Our Economy

Pratt Institute

The profession of industrial design is about twenty years old. In the course of these past two decades, the term "industrial designer" has come of age. It has been accepted as representative of a new profession, even though the majority of Americans have never heard the term, much less know what it means.

To explain the scope of industrial design, it is interesting to break down the meaning of the two words separately. Webster, many years before "industrial design" was born, defined the word "industrial" as "denoting the processes or products of manufacture." The processes and products of manufacture are mass production itself, and, in general, this is the medium within which the industrial designer creates. So far Webster has not led us astray. He says "design" is "an arrangement of forms or colors intended to be wrought out for use with various materials." Further, he calls a designer, "the one who is instrumental in the adaptation of a means to an end." Thus we see that from a purely dictionary standpoint, an industrial designer is a person who works with form and color and the other basics of art to produce a product to be manufactured by mass production.

No profession delves more deeply into the daily lives of *every* American than the industrial designer's. Nine out of ten articles you use every hour of the day and night are planned, studied and created by the industrial designer.

To help you wake up in the morning, the industrial designer has given thought to your alarm clock. He has tried to find a bell that will not jar you out of your sleep with a shock. He has selected colors that will fit with the average bedroom interior. He has planned the dial so that it is legible and still smart. He has designed a case that has eye appeal and yet can be manufactured in mass production within the financial means of Americans with even the smallest incomes.

When you go through the morning routine in the bathroom, you use a toothbrush to which the industrial designer has given many hours of careful thought about its color, shape and materials. You squeeze tooth paste from a tube whose packaging is such an important item that it had much to do with your buying that particular tooth paste in the first place. You gaze into a mirror which illuminates your face completely because some industrial designer has devised the lighting fixtures to do it that way. Your medicines and toiletries are easily accessible because the industrial designer foresaw the handiest spot for them in your medicine cabinet.

The industrial designer also styled your razor, whether electric or steel blade type. He shaved with that razor many times before you did, to

The industrial designer must work with the actual materials of production to produce designs that are not only well styled, but functionally sound and capable of low-cost manufacture.

A consideration of human proportions is a basic part in the planning of nearly every product. Only a careful study of the consumers' needs can provide a truly adequate solution for a mass market.

Pratt Institute

These ceramic pitchers were designed to hold a liquid quart, and to fit without wasting space in your refrigerator. To do this, the handle has been made part of the container — an excellent example of how functional requirements can influence fine design.

J. Gordon Lippincott, designer. American Chain & Cable Co., Inc.

A lawn mower must be designed for high mass production. It not only requires styling for consumer acceptance, but a thorough knowledge of materials, tooling and production methods, in order to reach the mass market at a competitive price.

see that it fitted the hand easily, to see how it lay on your cheek, and to note how fast it shaved. He designed an attractive box for it which probably caught the eye of your Aunt Susie, and that's why *she* gave it to you last Christmas.

Yes, and the designer worked on your lavatory faucets to make them good looking as well as easy to turn on and off. He styled the bath tub, the shower head, the shower curtain and the linoleum pattern on the floor. Even those handsome colored towels are all the product of some designer's ingenuity.

At breakfast, you use silverware whose pattern the designer has created, and like as not, eat from plates that some industrial designer originally made in clay. Naturally, such common needs as household appliances have all been studied and planned by the industrial designer. A designer spent many hours of thought determining your toaster's appearance, making sure that it pops up toast which is evenly browned and can be obtained without burning your fingers.

At this point, you might ask what it costs to create a toaster. All told, designing and engineering an automatic toaster costs anywhere from $20,000 to $30,000. Making the steel tools for its manufacture adds another $20,000 or $30,000 and, of course, the cost of advertising and distribution will increase these figures considerably before a single product reaches the consumer. Thus, you see that little toaster you look at so sleepily early in the morning, and use in such a matter of fact way, has had a surprising amount of expensive human talent and energy put into its conception.

Whether you drive to work in your own car or utilize a public conveyance, you use a vehicle that has been studied and styled by some industrial designer. If there is enough room for your legs, if the seats are comfortable, if it is quiet, if its colors are pleasing and restful, if you are proud to own it – then you can thank an industrial designer who thought of all the characteristics you like and incorporated them into the design.

And how about your wife? There is hardly a thing in your home she touches that isn't the brainchild of some designer – the rug she walks on, the radio to which she listens, the washing machine and electric iron that save her time and health. Yes, even such common things as egg beaters, lipsticks, baby rattles and can openers have all been carefully designed and studied to increase their usefulness and their eye appeal.

You might ask, why has America adopted style and the industrial designer when for years people got along beautifully without them? When

your great-grandfather brought home the first new hand pump and put it in the kitchen, your great-grandmother was lifting water in a pail from the brook. This new pump was a success because it *worked,* and aided the whole household in a most utilitarian way. *At that time, anything that worked would sell.* It was an era of *scarcity.* Emerson summed up its interest in every product: "If a man . . . make a better mouse trap than his neighbor, the world will make a beaten path to his door." Style was not so vital as function. This was because we were a young, growing nation. There were not enough needed manufactured goods to go around. Whether a product had eye appeal was of no consequence. No one asked for a *pretty* pump. Everyone wanted a pump that *worked.*

Today we are a mature nation with more manufacturing capacity than we can use. In order to stimulate the purchase of more merchandise, style has been utilized. The automobile industry provides a good illustration of how this factor works as a sales stimulant. Most new car buyers purchase a car, not because their old machine is worn out, but because the new car is more attractive to the eye. This business of trading in used things for something new is purely an American phenomenon. There are few national events that the average American looks forward to with greater interest than the annual automobile show. The American public has been accustomed to expect that the new car will be bigger, better, slicker and produce more for the money every year. That's the American way of doing things. The fact that the automobile industry has met this demand by changing the styling of its products each year indicates very forcefully how "style obsolescence" can move merchandise. It is probable that about two new cars out of five are bought each year because of "style obsolescence." This means that the industrial designer is responsible for two out of five jobs in the automotive industry. If appearance improvement each year can sell more American merchandise, then the industrial designer is playing a key position in maintaining increased employment.

Moreover, our habit of trading in old things, not yet worn out, for something new and stylish is a practice that is highly promising. It means not only that original buyers will provide outlets for the mass of merchandise our factories will produce every year, but that, in passing on used cars, homes, radios and the like, they will make it possible for people in the lower income groups to enjoy those things which give us a high standard of living.

We are now entering an era when most articles in common use will change their appearance annually. Radios, refrigerators and all electric appliances will soon come out regularly with yearly models. We are in the midst of an era of tremendously accelerated product improvement — a period in which the consumer will soon get more for his money than ever before in history.

Many people have asked, "Isn't styling costly and wasteful? After all, if new models are brought out each year, tremendous investment must be made in their creation and tooling for production." The answer is that the cost of engineering and tooling a new model each year is usually less than five per cent of its total sales and this cost is far more than offset by the *increased sales volume* that styling stimulates. Every American knows that mass production is based on volume, and *any technique that can stimulate greater volume can easily write off the proportionately small cost of new designs and tooling each year.*

The industrial designer has done another thing for the American public — a subtle thing which the average person doesn't realize but one that is surprisingly important to our future economy. He has made the public look forward to change. The fact that he designs new and better things for the manufacturer to produce each year has meant that the American public *expects* new and better things, and this is the first time in history that a large mass population *looks forward to change.*

In the past, most inventors have died penniless because their patent rights expired before they could educate the public to buy a new product. History is full of tremendously important inventions that were completely neglected by the peoples of their time. When the first typewriter was invented everyone called the inventor a fool because, most people asked, who would buy a hundred dollar machine that replaced a five-cent pen?

Man has always been afraid of new things and has resisted change. For instance, when the first locomotives began to run in England, a law was enacted which required that a man be employed to walk the tracks 100 yards in advance of the locomotive to warn the populace of its approach. Going further back into the history of inventions, we find that men were so antagonistic to inventions and to changes in their way of life that the inventors of new machines were often jailed or even burned at the stake. Even the great Leonardo da Vinci often came close to harm for his radical thoughts and achievements.

Thus, to have a mass population *expecting better things* is truly unique in world history. American industrial preeminence is predicated on giving the consumer what he wants. This is the basis of American business success, and if the consumer expects something better each year, industry will live up to these expectations.

This means that American industry in the future can lead and continue to grow faster than any other industry in the world. There is no doubt that we will continue this leadership because *consumer expectation stimulates research, product improvement, and ever new design and growth.*

What Is Style?

Style is a mode of consumer acceptance and derives its power from our tendency to imitate — the herd instinct. Once crystallized, good style or bad, it becomes a mass goal for the consumer.

The basis of all styling is to be found in the fundamental principles of art. Whenever man fashions materials, works with words or even thinks thoughts, he utilizes artistry within his medium. His tools are esthetic principles and the result an artistic and emotional expression. If the product is fine, then art is well applied. But even though in retrospect we judge the article crass or ill-adapted to its purpose, the result represents the style of that particular moment in history.

In all art expressions, certain basic principles have applied, whether the result has been a Greek temple, a prefabricated gasoline station, or a ten-cent store orange squeezer. The knowledge of these fundamentals of art and how to apply them is the basis of all sound designing.

All expressions in design are largely emotional, and our appreciation of form, color, balance, texture and all art characteristics is predicated on this principle. Consequently, to appeal to the mass market, style-wise, it is essential to have an understanding of why the human being is sensitive to design.

Our basic appreciation of design is ultimately dependent upon what we sense through vision, taste, hearing, smelling and feeling. Since our five senses have developed through the ages along with the other products of human evolution, we have inevitably acquired an instinctive appreciation of *natural* forms. Hence, much of our decorative design is based on such natural sources as flowers, trees, or the figures of humans and animals.

This tendency was particularly strong in ancient times. Early architecture, for example, produced supporting columns simulating trees and floral forms. The Egyptians used a lotus bud column to support the halls of Karnak and the columns of the Greek Corinthian order were crowned with acanthus leaves of stone.

Edward Weston

Nature is our primary source for art inspiration. Since man has grown in a natural environment, floral, geometric, and abstract design all find inspiration in the common things that are a part of everyday living.

Dr. Harold E. Edgerton, M.I.T.

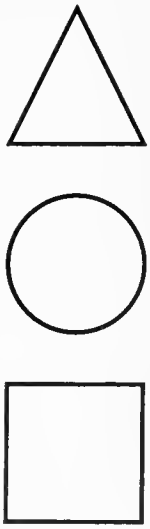
Science is bringing us new art forms never before even imagined. This high-speed photograph of a splashing milk droplet gives us an inkling of the sheer beauty that lies in the unknown all around us.

As you walk up Fifth Avenue in New York, you will notice that four buildings out of five have a floral influence in the design of their surface decoration. In such things as fabrics, rugs and linoleums, natural and floral forms are an important part of creative design. Man has always lived in a natural environment, and has been stimulated by nature. It is logical to expect, therefore, that he would use this stimulus in his art.

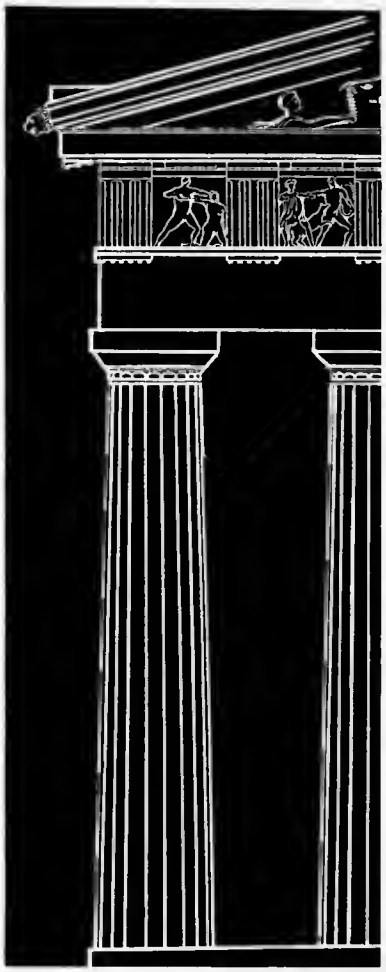
Another source of design inspiration is an appreciation of the abstract in geometric design. This is somewhat more difficult to explain than the environmental appreciation man has for nature, since purely geometric shapes are seldom found in nature in visible form. Scientists illustrate the molecular structures of all natural things, using symbols in geometric designs, but these molecular arrangements are not visible to the unaided eye. Therefore, stimulation from the geometric form is more intellectual and more purely esthetic than emotional. The geometric forms include: the sphere, prism, pyramid, cone, rectilineal solids, straight line, rectangle, triangle, square, circle, hyperbola, parabola, ellipse, logarithmic forms and many more. Geometric forms are found in primitive art — for example, in the zig-zag lines that decorate primitive pottery. Most of the ancient Egyptian and Inca designs originated from the square. Possibly one of the principal reasons why we appreciate geometric forms is that *all life is arranged in orderly basic structures.* A cross-section of a plant stem, the honeycomb of the bee, crystalline structure of quartz and most metals, the geometric pattern of the snowflake, a flower, the orderly geometric arrangement of atoms and molecules forming a substance — all point to these sources as stimulating our geometric appreciation. This is not to say that mankind has always been aware of these sources, but *their appreciation has been intuitive and a part of his subconscious fabric.*

Appreciation of abstract design in geometric form probably requires more sensitive and intellectual training than appreciation of natural form. In any case, geometry came many centuries after mankind had found ways to express himself visually.

Our trend within recent years has been toward geometric styling, which is indicated by extreme economy of line that eliminates extraneous details. Because geometry is a logical science, it is natural that the age of mass production should tend toward geometric design rather than floral design. Our machine tools are all the products of geometry. For example the lathe, king of all machine tools, cuts all objects around a common *center,* while the shaper and planer cut in *straight* lines. Thus when indus-



In early eras man's most common environment for living has been the forest. It is not surprising that floral motifs have been the basis of decorative and ornamental expression. The Corinthian column has modified the Acanthus leaf of nature to produce a decorative architectural form.



The post and lintel construction of the Parthenon shows the influence of a natural environment on structure. The elasticity and continuity of modern structural materials are our primary reasons for departing from these earlier styles.

Gardner A. Dailey, Architect

Modern materials such as glass and steel have added greater spaciousness and increased scope in planning contemporary architecture. Note that a natural environment is still essential to beauty. The trees in the foreground have added greatly to the charm of this home.

trial design was first introduced about 1925, the trend immediately became one of greater simplicity in line, greater honesty in use of materials and more applied geometric forms. Designers during this period followed nearly pure geometric expression. However, fine designs could never be achieved with the T-square, triangle and compass alone. Subtleties in line are required to produce truly fine forms. Even the Greeks had *entasis,* or slight curvature, in their Parthenon columns, and likewise our present day refrigerators require slightly crowned metal surfaces to break up the sterile sheerness which would result if all lines were straight, or radii.

Since style appreciation is basically emotional, it is tied up to other human traits such as fear, pride, love, hate and similar factors, all of which influence the acceptance of a product. For example, pride — as illustrated by our common desire of keeping up with the Joneses — has a considerable effect on style obsolescence. On the other hand, love and human affection are effective stimulants to buying at Christmas time. Products planned as gift items are appealing to this instinct.

Another human trait that plays a definite part in product styling is habit. Most people buy through habit unless this trend is interrupted by advertising and point-of-sales displays, which activate the impulse to buy. Many companies exist today in a competitive market not because the products they produce are the best but simply because, once the inertia of

habit is set in motion, it can run a long time before it begins to slow down. Housewives ask over and over again for certain brands of foods from habit. To swing their preferences to other brands, frequently of greater merit, requires expensive sales campaigns and new and fresh package designs.

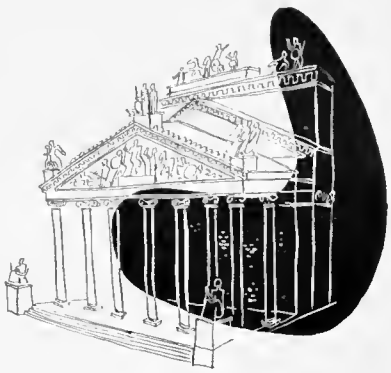
Style is no mystery to those who study it. It can be forecast, and forecasting it correctly is the job and the accomplishment of the experienced industrial designer.

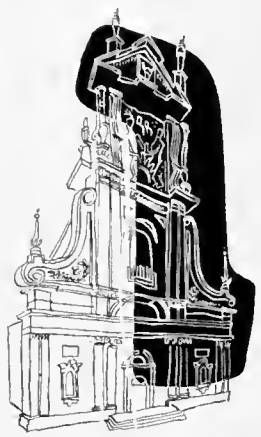
Style runs in cycles — a principle manufacturers and designers must remember. It is a living thing, never sleeping, always changing, and the style that sells today will be gone tomorrow. Manufacturers selling the mass market are in much the same position as three men riding the ocean's waves. The one who copies last year's leaders for this year's sales is like the fellow in the wave's trough; he can never hope for maximum consumer acceptance nor top price. He is too far behind to be carried along by the upswing that comes with general interest. The man too far out front — with a product so advanced that it is a "freak" or an "orphan" — is as badly off. Ahead of the wave of buyer interest, he is fighting all by himself and rarely gets far. But the manufacturer who styles his product to the vogue of the moment is like the swimmer riding the crest. Taking full advantage of the upswell of fashion, he sees sales mount.

Study of styles of past eras is instructive. One phase that always moves in cycles is *simplicity in design versus ornamentation.* The early Greek temple, for example, was crudely simple. By the time of the Golden Era of Athens, many subtleties and some richness had been added but the structures themselves continued basically simple. The Romans, as the style progressed, abandoned this simplicity for richer ornamentation. Soon after the fall of the Roman Empire, design reverted again to simplicity in the Romanesque style. During the Renaissance, when classic styles were revived, simplicity appeared first, followed by a gradual trend toward increased ornamentation, ending with the sensuous ornament of the Baroque.

Riding in on this heritage, the St. Louis fair in 1903 set the classic pattern for much of the architecture of our American cities. Our railroad terminals and public buildings took on a bastardized air of the old Roman Forum — and were as inefficient and out of place as a Roman chariot at an automobile race.

At the start of any new style trend, simplicity and vigor are usually in evidence. As the style matures, richness in ornamentation is added. Finally, as the style grows old, ornamentation dominates function and in rebellion youth creates a new style in opposition. It is seldom that history judges any style as "perfect." Some styles are good and some are poor even as some political structures are good and some are poor; and, like governments, they rise and fall — with youth and new ideas forcing out the self-satisfied who can see no change.





New styles, like youth, are often impetuous in their attempt to break with tradition. Thus new styles are apt to be lacking in subtleties, in warmth, in human qualities. The break with tradition in architecture, starting with the international style, produced houses that were sheer rectilinear boxes with holes cut in them. Interiors were severely simple and hard, with chrome furniture and mirrored fireplaces. The break with tradition was complete but it was also cold and, therefore, was unacceptable to the average American. We are now entering a period where modern design or "contemporary design" as a style is reaching proportions of widespread mass acceptance. People are beginning to realize that modern furniture and modern homes are not only better functional solutions to the problem of daily living but also better esthetic solutions. The modern interior no longer needs to be cold and formal. Larger areas of glass are offset by the greater use of textured materials — fabrics, new synthetic fibre boards and wood veneers. We have a new respect and appreciation for wood — one of the warmest and most expressive of all materials. Combined with plastics as an adhesive, it can give warmth and pattern to any room in the house — even the kitchen and bathroom, because plastic-coated wood veneers are now waterproof.

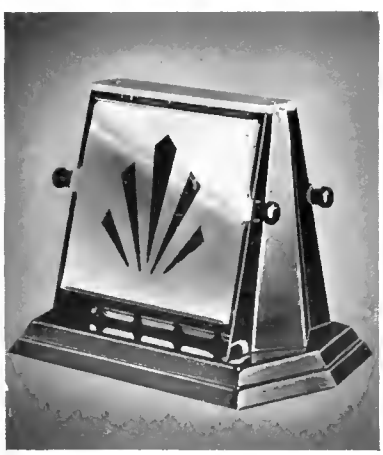
However, the greatest reason for the growing consumer-acceptance of modern as a style is that modern design has become mature — it has now come of age. It is no longer a rebel that insists that "form follow function" to the letter. In basic planning, form, of course, does follow function. In actual application, many of the little luxuries that make a home worth living in depart considerably from the rigors of this philosophy. Modern architecture, because it is mature, sensitive and confident of its future, is now producing homes that are appealing to the average American woman. As such, "modern" as a style has reached maturity.

Streamlining as a style is past, except in entirely functional applications such as aircraft. This is true because it has outworn its welcome and the eye is tiring of completely streamlined forms. Streamlined fountain pens, refrigerators, radios and homes did look interesting and inviting some ten years ago when the style was new, but today these "soupy-soft"

plastic forms are becoming monotonous. It is safe to predict that contemporary style will soon trend toward architectonic forms where there is a greater variety in crispness and straight lines, more flat surfaces, more prismic forms and more interest in color and texture.

Essentially, streamlining meant producing a sleek, sheer surface. It eliminated all nonessentials. It covered all surfaces with cowlings or coverings. Products were designed as if to move through a fluid medium such as air or water, and in so moving, to offer the least possible resistance. In 99 applications out of 100, the streamlining had little or no effect on prior deficiency or present function. Streamlining an automobile does not increase its speed in normal use any more than it helps to carry your toaster from the kitchen to the dining room more rapidly.

Streamlining, as a style, is past, for it has outlived its novelty. It was born in an era when the style cycle had swung to complete simplicity, even



Style is always changing—never static. The above toaster with its step-back base and flashy decoration actually enjoyed high consumer acceptance in the early 1930s.

This toaster, a product of the late 1920s, shows the definite influence of cubism in the diagonals used on the center panel. Note also the step-back laminations on the plastic controls—an influence in style from the step-backs of our skyscraper architecture.

The contemporary toaster looks lower and sleeker because molded plastics have been combined with metal to produce a color change adding variety and improving appearance and function. This design is seeking beauty through fine proportions and a contrast in material and texture rather than through applied surface decoration.

The use of parallel lines as a decorative motif was common to nearly all appliances during the 1930s and occasionally still appears although it is now definitely style-obsolete. Parallel lines and geometric styling are the result of the geometric simplicity fostered by the severe interiors of the International Style of architecture.

to the point of being sterile. Modern automobiles and appliances will, of course, retain some of the elements of streamlining. This is because in drawing compound curved bodies of sheet steel, round corners are easier to draw than square ones. There is, however, no need to design a car without a straight line or crisp accent in its entire makeup. Monotony is the only result.

We have just passed through a period of stark simplicity in modernism, of chrome chairs and box-like houses. Modern design is coming of age. It will be warmer, mellower, with a finer sense of ornamentation. The basic simplicity will remain as a serene background, accenting the newly applied richness of color, texture and handcraft design. There will be increased demand for objects of art – glass, china, mirrors, sculpture, painting.

Style periods are becoming of shorter and shorter duration. There is today more style change in one year in the automotive field than in one hundred years of Egyptian architecture. Style obsolescence is now being *planned for* in order to move merchandise. Consequently, we may anticipate even more rapid cycles in the future.

J. Gordon Lippincott, designer. Maguire Industries, Inc.

Contemporary style is simple with an emphasis on fine proportions and a delicately balanced use of materials. We are entering a period in which modern design is reaching maturity. This means we may anticipate a period of growing richness in ornamentation, greater warmth and variety in design.

Automobiles Prove Style Is Never Static

The automotive industry can take the lion's share of credit in building the new profession of industrial design. This is because the automotive industry was among the first to apply style obsolescence as a means of moving merchandise. Through wide national advertising, good publicity and continual yearly style changes, this industry more than any other has conditioned the American consumer to expect change and continued product improvement. All this has been possible only because of high mass production.

Early cars were made in relatively low volume without costly tools and dies. Their bodies were built of wood and sheet steel—necessarily architectonic in structure. Consequently lines were stiff, with right-angle intersections, so typical of wood construction, predominating. Since cars were fabricated by handicraft methods, many more hours of labor were required in manufacture.

Gradual consumer-acceptance meant greater production and correspondingly greater investment in tools and production equipment. Since compound curvature increases the rigidity of sheet metal, streamlining as a style developed naturally; yet even up to the production of the fifteen millionth Ford, little attention had been given to styling as a means of stimulating sales.

The depression of 1929, coming at a time when we had greatly overexpanded production facilities, stimulated styling as a means of moving more merchandise. The automotive industry in particular found that the American woman had a great deal to do with car selection, and that improved styling and easier operation could appeal to the feminine market. This trend was so successful that today nearly all automobile advertising is directed toward the American woman and styling is an important factor in every campaign.

Automobiles were also among the first products whose styling was used as a means of "trading-up" in the merchandising of deluxe lines for greater profits. All automobile manufacturers now merchandise lines featuring "leaders" at low list prices as the basis of advertising and the means of attracting initial consumer interest. Both the dealer and the manufacturer make their real profits by stimulating the consumer to "trade-up"—to buy a higher-priced deluxe model with extra equipment. Styling has proved an important means toward achieving this end.

During the thirties, styling progressed hand in hand with engineering to produce not only a better looking car but more car for the money. This has been done largely through simplification in the solving of basic needs. Remember the old days when you drove your car on a vacation and had luggage strapped to racks along the running boards? In the early thirties, the luggage rack was moved to the rear of the car. Still later, a weatherproof trunk was used on the rack in the rear. But an extra trunk as an attached unit is far more costly than storage space built into the body itself, and gradually the trunk compartment became an integral part of the car, giving the consumer more luggage space and a better looking car for less money. This is a typical example of simplification in product development. Note that during the various stages of progress, *each new step was used as a merchandising feature leading to style obsolescence.*

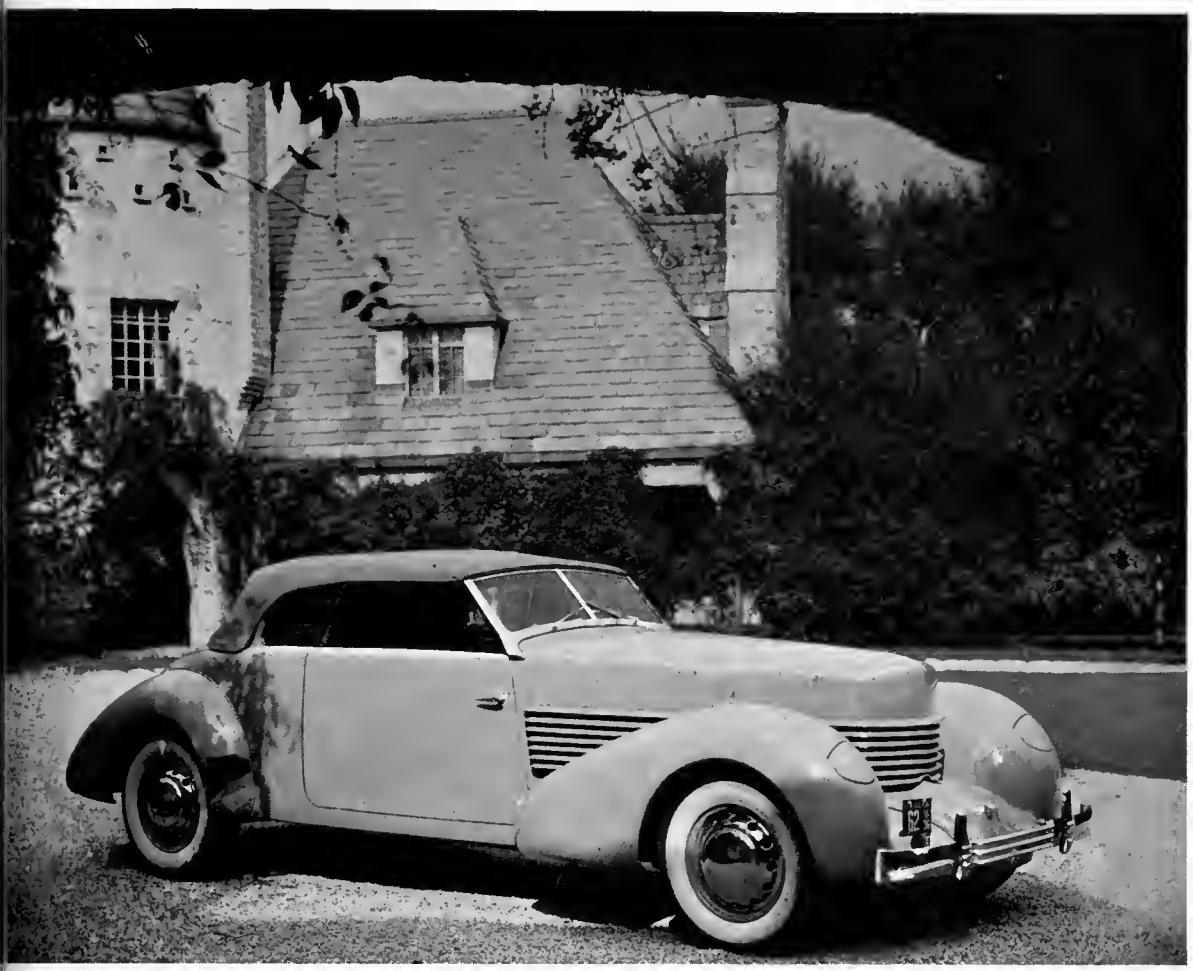
All cars are closely similar in styling, and year-to-year progress is rather slow. This is not lack of enterprise on the part of the automotive manufacturers but rather a conservatism forced on them by the magnitude of their investment. Most men in the industry can pretty well forecast how the American automobile will look five years ahead, but they know it is wiser to change in easy stages than in one jump. If there ever was an opportunity for the automotive industry to come forward with something truly distinctive and outstanding, that time was at the close of World War II—a period of tremendous consumer demand and expectation. Despite this opportunity, the new entries into the automotive field were relatively conventional motor cars in trend with their competition. The teardrop-bodied, streamlined cars of the Sunday news supplement features are still many years away—because investment in the automobile business is too great to permit gambling on consumer acceptance.

Style leaders in automobiles, as in apparel and furniture, have always been the very high-priced cars. The 1936 Cord was a style leader but not a sales success because it was priced so high that volume was relatively low.

Planned style obsolescence is a new concept in mass merchandising. Most of the changes in the early days of the automotive industry were based on mechanical improvement—even the fifteen millionth Ford gave little thought to style as a means of increasing consumer appeal. The severe competition of the 1930's was largely responsible for the concept of style obsolescence.

This is a publicity photograph of the "new" 1933 Graham showing the tremendous advance of automobile styling. Note that if a 1947 car were added to this picture it would make both cars seem completely obsolete. It is safe to forecast that automobiles 15 years from now will make today's automobiles seem equally antiquated.

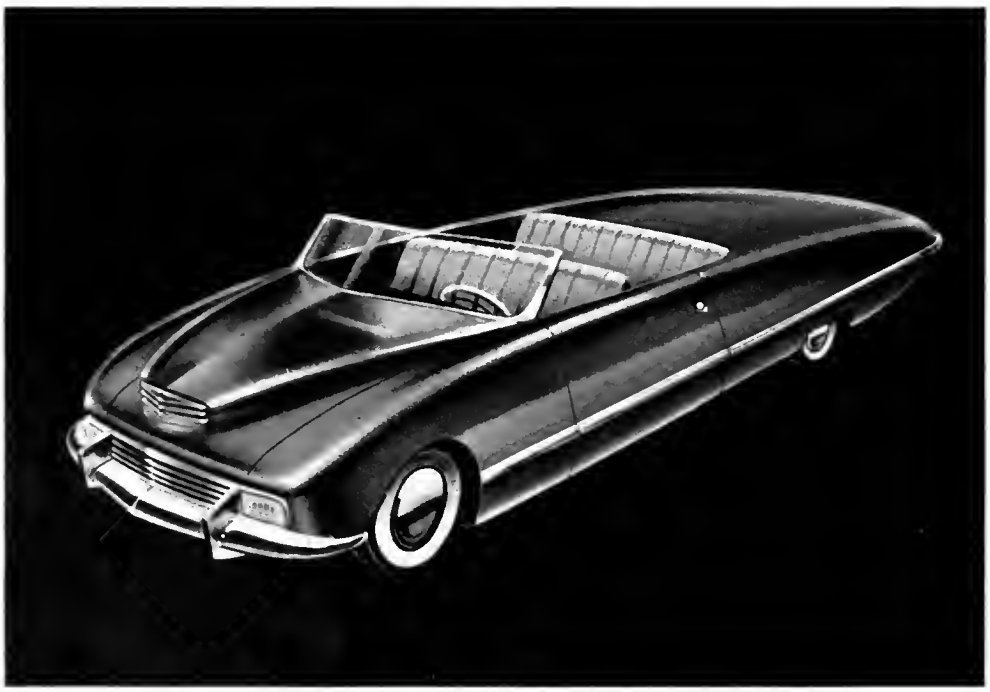
The 1934 Chrysler Airflow was the automotive industry's classic example of reaching ahead of consumer acceptance in style. This car was superbly engineered and excellent in performance, yet its sales were low because it reached ahead of consumer expectation. The experience of this car has caused all manufacturers to style in common trend — seeking only gradual step by step improvement.



Simplicity and good form endure without tiring. Gadgets and "style cliches" date automobiles. This Cord is over 10 years old and yet, with minor modifications, is still in style.

However, it established a trend that lasted for ten years. *This car emphasized simplicity as a characteristic of the beautiful and costly.* Large fenders, minimum use of chrome trim and the simplicity of the hood, with its peak down the center to pick up highlights, forecast a style trend later copied by many other manufacturers. Actually this Cord, with minor modifications, is still in style today. Gadgets date a car style-wise, and while this is esthetically unfortunate, it is desirable from the automobile manufacturer's point of view since it is a means of moving automotive merchandise.

High sales are not, necessarily, an index of good styling. The chrome bands plastered on the side of this car have proven costly to every owner — a minor bump causing them to fall off. Ten years from now we may look back at this car in the same manner as we do now toward a mid-Victorian living room covered with tassels and gewgaws.



The contemporary trend in automotive styling is toward the elimination of fenders, resulting in simpler body construction and adding greater accent to car length. A husky chrome strip at bumper height adds the needed interest in highlights to a streamlined body. Note that body forms are crisper, producing sharper highlights of greater interest, suggesting greater body width and length.

Automobile styling starts with initial creative sketches. These designs are a reasonable forecast for cars to 1960. Beyond that date it is difficult to forecast because of technologies yet unborn. Teardrop-bodied cars with plastic tops and stabilizer fins are far more likely to be seen in the Sunday supplements than on the road. No large automobile manufacturer can afford to guess wrong in consumer acceptance — and while automobiles will change continuously they will not change radically within any one year.

The automobile industry was among the first to establish large-scale continuous research, with major engineering changes every other year and style changes every year. They were among the first to show that the basic tools and engineering of a given design could be used on a line of several different cars, offering the economic advantage of higher unit production, while styling and various brand names were depended upon largely to build the idea of distinction in the consumer's mind. This tremendously high production has been one of the reasons why independent automobile manufacturers have had a difficult time surviving.

Developments in the aircraft industry during the war resulted in new techniques for metal forming and fabrication for relatively low production, and this knowledge should be of value to the independent automobile manufacturers. They can now afford style changes yearly without too great a tooling investment. The use of low-cost plastic dies in the forming of aluminum and steel means that body construction for relatively low production volume may now be turned out with far less capital investment. Elimination of fenders and running boards will result in less difficult drawing operations. Machines have now been developed that can draw sheet steel through adjustable dies, forming compound curvature to exact specifications with no tooling investment whatever.

This means that the independents now have a *unique opportunity to make style changes more often than their larger competitors* who, because of very high volume, must continue to use costly steel dies. There is a possibility that some of the independents may bring out style changes as often as twice a year, aiming to skim the cream off the market with the sale of more distinctive cars. Here style leadership would definitely sell the car and more personalized design would be possible. The independent automobile manufacturer can move with greater rapidity than large corporations because smaller organizations have less inertia and can seek markets that are unprofitable for larger operations.

The automobile industry will continue to prove that style is never static. There is no doubt that the car of 1970 will make those of today look absurdly obsolete. The merchandising lessons so well established by the automotive industry are now being applied to many other consumer products, with style obsolescence a primary means of stimulating continued sales.

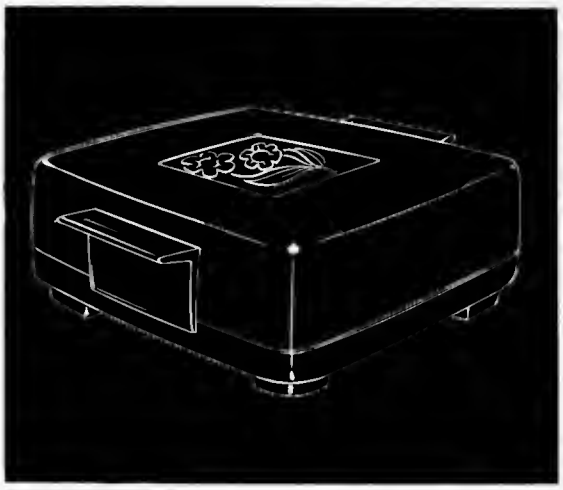
Influence of Women's Styles on Industrial Design

Since women buy nearly 90 per cent of consumer products, and since they are particularly sensitive to style, it is important to make a study of feminine buying tastes in order to forecast style trends. It takes a year, for example, to design and tool for a refrigerator. When the product reaches the market, it must be "in style" – at the peak of the consumer preference trend. For this reason, style forecasting is necessary. *Very few products demonstrate style leadership. In general, they follow a common trend or pattern, leaving it to the distinctive few to develop something truly unique and outstanding.*

John Rubel Designer. Eleanor Lambert

Larry Gordon

Above all, women like pretty things—pretty dresses that make them beautiful, jewelry and furs that make them glamorous. The clothing and cosmetic industries have appealed to this basic desire of all women and as a result have grown and prospered tremendously during the past 20 years.



All other products can achieve greater feminine appeal through more decorative design by watching style trends in the things women buy for luxury rather than for use. The waffle iron sketched above shows a floral motif in vogue with current trends of decorative jewelry. This does not mean we should necessarily copy jewelry forms and put them on appliances—it does mean, however, that current feminine buying trends indicate they prefer these forms to the parallel geometric lines that have recently been applied to so many products.

One manufacturer brings out a new electric iron. It has a handle distinctively new and fresh in pattern. Backed up by good advertising and sound merchandising — it sells. The next year most of the less imaginative iron manufacturers copy this model because it proved successful in actual sales. They have, however, copied it a year late. The cycle of consumer preference is changing with increasing rapidity and style forecasting that produces a product distinct from competition, and yet in the mode without being freakish, has the best chance for a high sales record.

Let us for the moment consider the purchase of a vacuum cleaner in a modern appliance store. We see ten different makes of vacuum cleaners, all at substantially the same price and with comparable features. The design which stands out and catches our eye is the one with *distinctive* styling. It is here that the primary purpose of styling makes itself felt. It narrows down the natural process of selectivity which runs through the consumer's mind and stimulates the purchase of the attractive product — rather than just any product at all.

As we said before, since nearly 90 per cent of all consumer products are bought by women, our problem of style forecasting is largely one of anticipating feminine tastes. Here, style leadership is set by the clothing industry. The style trend set by women's dresses influences the style trends in jewelry and cosmetics. For example, some years ago fuchsia was the popular color. It was also a strong, brilliant, dominating color and, as such, demanded new colors in cosmetics to make an appropriate and striking ensemble. This had its effect on colors in home furnishings.

Another interesting trend to note is that women's dresses, during World War II, became more simple and were made with fewer frills — the result of the severe shortage of fabrics. These plain, simple clothes required further adornment, and produced a tremendous growth in the ornamental jewelry business such as the vogue for pinning large, decorative jewelry to dresses and coats.

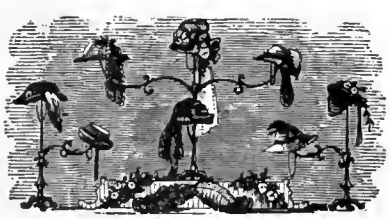
This jewelry, as a fashion trend, influenced the styling of such related objects as compacts, cigarette cases and many other smaller articles. Appliance manufacturers should capitalize on these style trends. There is no reason why electric toasters and refrigerators should look like the front end of an automobile. This "automotive" type of styling is neither gracious nor suitable to a home. If one wants to know what the average woman is buying, let him go to the smart dress shops, to Saks Fifth Avenue and Lord & Taylor — or to Black, Starr & Gorham and Georg Jensen. *Women who buy*

decorative, pretty things in jewelry will gravitate toward these same styles when modified on appliances. There is no reason why an electric toaster should not have a rich medallion as an ornament to relieve the monotony and hardness of the chrome housing. It is common knowledge that a refrigerator is sold largely on its interior. This interior should have desirable functional qualities, *plus such decorative appeal that a woman simply cannot resist buying it.* Manufacturers should watch women's clothing styles closely because they *do* indicate feminine buying preferences and the careful analysis of these trends can forecast style advances in other fields.

There is also another aspect to consider. Style in clothing is not only a matter of line and texture but also of *color.* In this field, it is important to realize that *a woman likes to be in harmony with her environment, and that color trends in clothing influence color trends in home furnishings.* The home furnishings market is entirely dominated by the tastes of the American woman. For a manufacturer to bring out a line of upholstered furniture in a color that is not in vogue leaves him in just as much hot water as if he were to bring out furniture of the wrong contour or shape. Women are particularly sensitive to color and their color preferences run in cycles. The clothing industry is sensitive to these cycles and, in many respects, builds and creates them. In the majority of cases, the house furnishing industry is alert to these influences and brings out new styles in harmony with these trends. Since house furnishings are a dominant part of the American home, all other articles used in the home are influenced by these color and taste preferences.

For example, if in furnishing her kitchen a woman has red checkered curtains, the chances are she will choose a red-trimmed canister set for her shelves. The alert manufacturer of canister sets would do well to study popular trends in consumer tastes for kitchen linoleums, curtains and dish-towels.

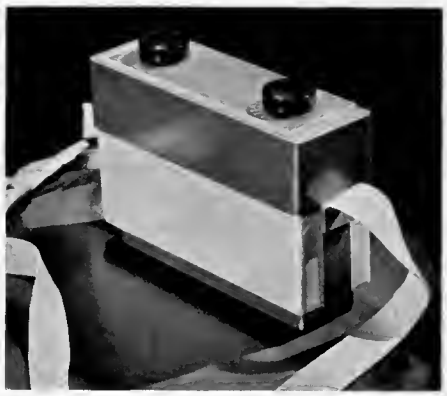
Kitchen appliances have been gleaming white for years. No manufacturer of ranges or refrigerators would dream of changing to a delft blue or a nile green; white simplifies too many problems. There is considerably less need for color inventory or color matching. But women are tiring of the hard, cold, hospital-like quality of the "streamlined kitchen." They want a warm, living kitchen because they spend more hours there than in any other room in the house.



Feminine preference always influences style trends. Note that when women preferred bustles, ostrich feather hats and voluminous skirts they also surrounded themselves with superfluous ornamentation so typical of our mid-Victorian era. Even such functional objects as a clock, a stove, or a coach-and-four all followed the same trend.

Although it will be a brave manufacturer who breaks the trend, it is safe to forecast that within a few years color will be applied to kitchen appliances again as a means of creating distinctive sales appeal. *The demand is there* because, in order to save space in the modern home, the kitchen is becoming more and more a part of the living room.

To further illustrate the parallelism between a woman's clothes and the furnishings of her home, compare the photograph of a mid-Victorian interior with the costumes of that period. It is obvious that in an era when women's clothing was superabundant in petticoats and large ostrich feather hats, her home had the same touch, and that even useful objects such as cast iron ranges, heaters and carriages all showed the same tendency toward superfluous ornamentation. Compare this with the simplicity of modern dress and note that our homes, too, follow the same trend.



The modern woman's preference for simplicity is demonstrated in the clothes she wears. Healthy outdoor living and a desire for sunshine have given us the bare midriff and modern homes with larger areas in glass. The simplicity in styling of all products, whether it be a modern interior or a portable radio, reflects the current buying taste of the American woman.

As soon as World War II was over, we began to observe a swing away from severe and stark simplicity toward a more luxurious use of materials, greater elegance and more ornamentation. The reason for this style trend was that materials became more abundant, permitting richer and more decorative fabrics for women's clothes. Furthermore, women were tired of skimping on yardage. The clothing industry capitalized on this reaction by providing dresses with voluminous skirts, sleeves with luxurious roominess, and many more frills.

All recent surveys show that the American woman is trending rapidly toward modern design in her home. She wants a *home,* which means a living place suited to her own tastes. She wants to furnish it herself, using her own creative imagination. She will buy her own furniture, her own fabrics and rugs, and determine her own colors. The same judgment and sensitivity toward design that she uses in choosing her clothing is bound to influence her

judgment in selecting fabrics and home furnishings for her interiors. You can rest assured she will use the same judgment in choosing her household appliances, automobile and the thousand-and-one other products she will have to buy to create a home.

Thus we see that women's styles in the clothing industry take the basic initiative in establishing style trends for *all* industry. Appliance and automobile manufacturers have been aware that women buy their products, but they have not been sufficiently clear as to the reason. If they were to spend more time studying what and how the American woman buys, and more particularly what she buys *for herself,* they would create products which would be in ever greater demand.

It is safe to say that women always want *pretty* things, but at the same time they want them functional. A large percentage of women went into industry during World War II. They have come out more practical. This does not mean that they have changed into engineers. It simply means that, in addition to requiring pretty and attractive products, they want them functional.

It is, of course, eternally difficult for man to understand woman — difficult, but not impossible. After all, the heads of our cosmetic industry, for the most part, are men, and since I know a few of them, I might add, real he-men. They have been particularly smart in merchandising the products of their industry. *No one has ever sold a cosmetic by appealing to the reason or the intellect of a woman.* Cosmetics are sold by appealing to the heart, to the emotions, and to vanity. Sex appeal and glamour are quite frankly the very basis of the cosmetic industry. The industry's leaders do no blushing about it. They admit it and merchandise it. The result has been that the cosmetic industry now ranks fifth in yearly dollar volume in all American industry.

If hard-headed business men can build up an industry like the cosmetic industry in a few years, and do it on sheer emotional appeal to the American woman, there is no reason why such common every-day objects as alarm clocks, prefabricated homes, hair curlers and helicopters should not be sold on the same basis. I do not say that this task would be easy. One cannot simply copy a glamourous advertisement for a new lipstick and in place of the word "lipstick" substitute the word "helicopter." Obviously, a careful analysis and a subtle approach is essential. But the important principle is: direct the primary appeal to a woman's emotions instead of to her intellect.

Lest the women readers of this book think that I underrate feminine intelligence, let me say that I do not. Women are just as smart as men — sometimes I think perhaps they are a lot smarter. They are smart enough to wield a dominant influence in many phases of life in the United States of America. They own more insurance and more capital than men do. They own more real estate than men do. They buy the vast majority of all our products and services.

In no other nation in the world is the woman placed on a pedestal, glamourized and worshipped the way she is in the United States. Literally billions of dollars are spent in national advertising, the vast majority of it beamed directly to the American woman.

It seems to me that since the American woman has succeeded, in a few generations, in putting herself in this dominant and enviable position, she should be given credit for her achievements. Certainly no one could accuse her of not having an intellect. On the other hand, I think the average woman, when she is perfectly frank, will admit that she would much prefer a man to admire her for her beauty than for her intelligence. There are few women who would not choose to be described as "glamorous" rather than "intellectual." The majority of women choose glamour and are primarily susceptible to products that cater to their choice.

It is simply that glamour comes first and I.Q. second when appealing to the average American woman, and *it's that way mainly because she wants it that way.*

The mark-up of the retail price in the cosmetic industry should teach business a meaningful lesson. It is, on the average, five times the actual manufactured cost of the article. The mark-up in the rest of the consumer industry runs between three and four times production costs. The cosmetic industry has always had this premium mark-up because it has established a *premium value on glamour.* To get this price, of course, the industry spends greater proportions of its dollar volume on advertising and styling. Nonetheless, it has kept its sights on what the American woman wants and as a result has built a wondrous and a prosperous industry.

It has been only within comparatively recent years that American big business has taken any cognizance of the feminine market at all. It wasn't too long ago that Henry Ford said, "You can have any color as long as it's black." For too many years electric mixers and washing machines have been conceived, engineered, designed, manufactured and distributed by men who never asked what the women who bought the product really wanted. Industry is just beginning to learn the tremendous buying power of the American woman. It is just beginning to learn how really to appeal to her. Take a tip from the women's clothing industry and the cosmetic industry. Basically they determine style and, as such, are among the prime movers of American business.

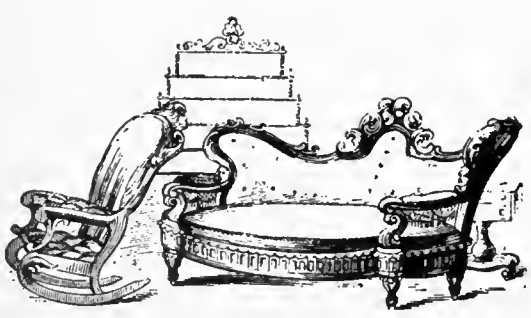
Combating the Anonymity of Mass Production

Art in the past has always been personal in nature. This was true largely because the artist was supported by the upper strata of society and nurtured as a pleasant luxury. Works of art were always signed by the artist—a practice carried even into the early era of the guild system. Chippendale furniture is well known as a style, not only because it is good furniture, but also because a chap named Chippendale designed it. The fact that it bore his name and his hallmark added *personality* to the product; made it distinguished. *The impersonality of mass production has lost this distinction and for this reason has lost something precious—something which, if regained, could be merchandised to the consumer.*

The impersonality of mass production came about because the techniques of mass production were so complex that the minds and talents of many men were required in the creation of the product. The production of the atomic bomb is perhaps the most recent example of the results of coordinating multiple creative talents and abilities. Today's products are no longer the work of any one man, and as a result no one man gets the credit. The product is good, but impersonal. The result is that the average American buys a Westinghouse fan or a General Electric toaster because he has confidence in brands. In other words, national advertising has established confidence in the *corporate* name—a confidence which formerly rested in the name of the craftsman himself. I do not say this is good or bad. It is just the natural evolution of mass production.

The point, however, should be quickly made that *people do not like impersonal things.* They like to feel that things they own are distinctive—that they are made specifically for themselves.

One of the reasons the American woman has never accepted mass-produced housing is that she refuses to live in a place which has no personality and looks like the home of everyone else. The proof of a woman's need and desire for things with a personality is that she pays premium prices for dresses bearing the names of America's well known fashion designers. Apparel manufacturers have actually been able to command a much greater price in a highly competitive market by using the *names of designers.* This practice adds psychologically one very important sales asset to the product—*personality*—and it does this in an era where too many things are strictly impersonal.



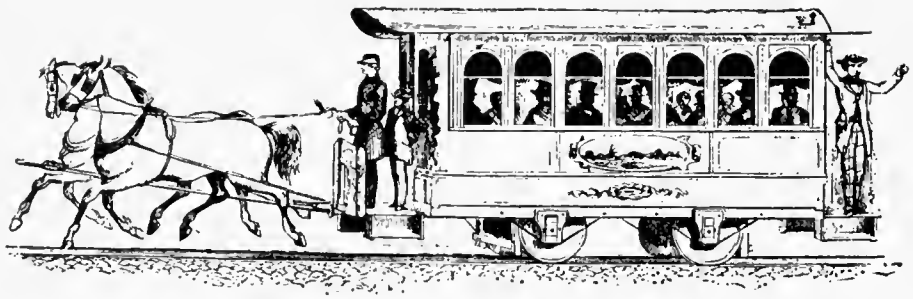
Nearly half our American population live in large cities where they do not know their neighbors or the families in the apartments nearby. A large city is an impersonal place; it lacks the friendly environment found in the small town where folks know their local shopkeeper as a friend. No one likes this environment where there are so many people it is impossible to know them all and where, when faced with the prospect of deciding whom among them to know, the average city dweller just gives up and withdraws within himself. Therefore, *it is a merchandising mistake today to sell an impersonal product in a city market where the crying need is for warmth, friendliness and personality*. Proof of this fact lies in the continued popularity of radio programs which have homey personality characteristics, like Henry Aldrich and Fibber McGee and Molly. They show that, basically, most people are friendly and dislike being regarded as just another unit in a great system of mass production and mass sales.

Two major industries *have* recognized the buying psychology of American women — the clothing industry and the cosmetic industry. Both of these industries have made breathtaking strides in the past 20 years and both have based their entire merchandising policy on glamour and personalities. Both have used the names of famous designers, stylists and users to lend quality and distinctiveness to their products. It is time the automotive industry, the prefabricated housing industry, appliances, and indeed all other products of mass production realized that a *product with a personality has added sales appeal.*

The airlines, in establishing themselves as serious competition in the transportation industry, capitalized on this American desire for personalized, distinctive service, in contrast to the railroads who have made far less personal appeal to their customers. Pretty hostesses aboard planes and at ticket counters have gone a long way toward stimulating consumer-acceptance of the airlines.

The gasoline and oil industry has established service stations throughout the United States, and their success is based on friendly assistance without tipping. This service has undoubtedly been tremendously helpful in the merchandising of company products. They demonstrate that no matter what your business may be, you can appeal to your customer on more than a price and take-it-or-leave-it basis. The extra sales impulse, based on emotional appeal, usually adds little if anything to manufacturing or operational costs.

Every consumer likes to feel that a product or a service has been de-



signed *specifically for him*. His impression of a pleasant trip on a train is not caused by any one circumstance but rather by an overall impression of environment. Proper interior colors and design, good air and sound conditioning, a smile from an attendant – all these little things develop a feeling of well-being and contentment. Proper colors and the right selection of fabrics are the result of *capital investment with a plan* because, obviously, right colors cost no more than wrong colors. Conditioning personnel to the philosophy that "the customer is always right" is a matter of training and morale building. Every product and service has its own specific personality problem but the aim should always be, *"this product or this service is truly distinctive from all others."*

In this era of anonymity in mass production, such qualities of personal appeal are a tangible and specific means of meeting competition. They depend far more on creativeness and guidance from the top of an organization than upon any vast expenditure of dollars. As long as people dislike the anonymity of mass production, there will always be added sales appeal in products that have a personality.

Limiting Factors of Design

Art, when applied to industry, is circumscribed by factors limiting the creative imagination and the expression of the industrial designer. He is limited by the machine tools that must be used to manufacture the article economically. He is limited by the materials he may desire to use, since for reasons of cost, structure and availability, his ultimate choice may be held down to only a few. He is limited by current style trends to create a product for which there will be sales demand rather than a product which gives mere personal pleasure to the expression of his own idea.

At first glance it may appear that the industrial designer is surrounded by so many limitations that the creative spirit of design must disappear. By contrast, the fine artist, whose work is not applied to mass production, has far fewer, if any, restraints. As a matter of fact, in abstract art there are substantially *no* restraints, and one might well ask whether art expression suffers when applied to useful objects under the limitations that must, of necessity, exist.

The answer is definitely no. The limitations are in reality a challenge. The thrill an industrial designer gets when he sees his brain-child coming off an assembly line is tremendous! To walk through a factory where thousands of workers are assembling parts which were first conceived in your mind and then to watch these parts grow into a final product; to see them advertised in newspapers, magazines and on the radio; to see them in department stores on display and in homes in actual use—this is the true satisfaction of the industrial designer.

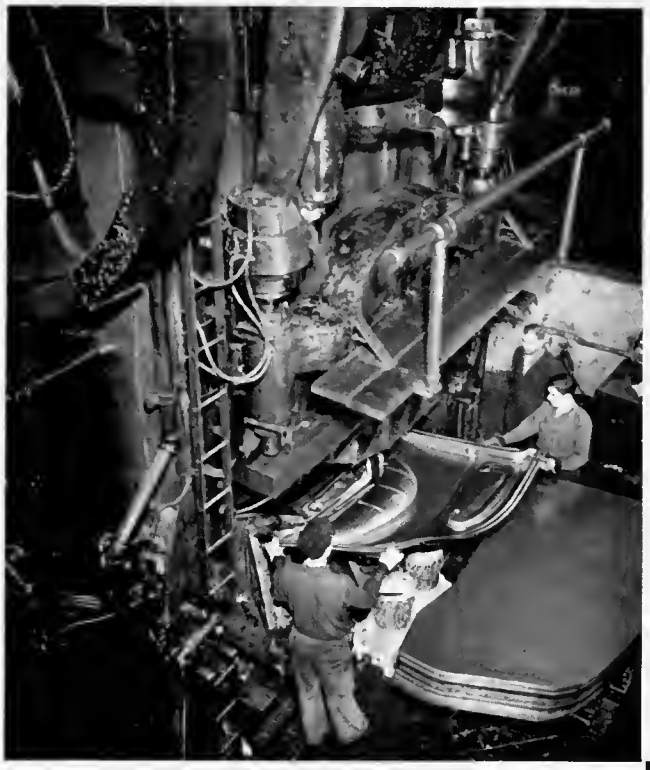
Art applied to industry is art appreciated by the greatest number. The limiting factors of design are ever present but they serve to *stimulate* the ingenuity of the truly creative designer rather than to discourage him. Actually we have so many more new materials available for design today than ever before that the stimulation is continual. I would say as a conservative estimate that I see several new materials every day, year in and year out, each one with distinctive design possibilities—each one inspiring new and interesting applications.

Designing within the machine tool, of course, has its definite limitations. Certain designs, practical for injection molding, are extremely costly in metal stamping. Some forms are easy to cast but very costly to forge. These limiting factors of design are common knowledge to the talented designer. He simply does not create what cannot be manufactured; if he did, his art would not see the light of mass production. Of course, the tremendous research stimulated by World War II has brought about *new* machine tools and new production methods. Designs which were "impossible" to manufacture a few years ago are now practical. Better methods of welding, powder metallurgy, printing, plastic molding, new adhesives—all are continually improving.

Our "know how" in mass production is at an all time high. Methods of manufacture and new materials are now developing at such a rate that no single person can possibly keep abreast of *all* the new and important developments. Only a staff of specialists can encompass the whole field. The industrial designer must be constantly aware of the basic trends, however, and must have able engineers at his elbow to guide him where tooling and methods of production are limiting factors in design.

After all, these limiting factors are industry itself—*the Art of Mass Production.* I have never walked through a factory without increasing my knowledge of production. Every assembly line or tool shop has demonstrated its own special ingenuity, and after visiting many hundreds of factories throughout the United States, I have acquired a profound respect for the average man in industry. No one has a corner on all the "know how"; and this, too, is stimulating to the designer. Actually, from an esthetic viewpoint, American industry, as an expression of our race and our time, is one of the finest art creations we, as a people, have produced.

There is nothing more dynamic than a large punch press or an electric turbine. Machine tools, while 100 per cent functional, nonetheless *are* dynamic, stimulating forms. I have seen thin, coiled strips of bronze coming out of a punch press, after the blank had been removed, making a pattern smart enough to be used as decoration on a woman's hat or a staging for some fine cosmetic shop. I have seen stacks of tall, sleek airplane fuselages shining and fantastic in their repetition — a sight as stimulating as any expression of fine art. I have watched filaments nearly invisible to the human eye being wound to make the grids of our miniature radio tubes — heart of the new electronics industry. When enlarged and projected on a screen for checking, these filaments produce patterns as fascinating as any in abstract art.



Chrysler Corporation

Corning Glass Works

Designers must work within the limitations of the machine tool and should have an appreciation for all materials of mass production. An understanding of how steel will draw in a die, or glass will blow in a mold is part of the training of a modern industrial designer, and an expert knowledge of the means of mass production results in products that are practical for manufacture as well as pleasing to the eye.

Gulf Oil Corporation

Important new materials are being born from the world of chemistry, and while the designer is not expected to understand such complexities as the manufacture of synthetic resins, he must have a knowledge of the application of plastics plus their molding, fabrication and structural characteristics.

Such sights in industry are not surprising or unusual. Since form follows function, many of the finest art expressions in our country are being produced by scientists and engineers aiming entirely at meeting functional needs. Industry, while surrounding the designer with a challenging number of limitations, at the same time stimulates him with more materials, methods, applications and possibilities than any creative artist has ever enjoyed in world history.

It should be pointed out that not all the stimulation comes from industry to the designer. The designer also stimulates the engineer by asking questions, such as "Why can't it be done?" The designer always brings a fresh point of view, and is perfectly willing to "stick his neck out" during the creative phases of design. Today style trends have stimulated our engineers to find ways and means of producing designs that yesterday were impossible to manufacture. For example, a few years ago the design trend to very large automobile fenders meant the development of drawing dies and spot welding on fixtures that previously would have been thought entirely impossible from a cost standpoint. Style trend, however, and its importance in stimulating sales is of greater concern to management than the engineering departments' cost-headaches. The designers created automobiles they knew would sell and then the engineers were called in to lick somehow the problem of producing them within cost limitations. The engineers who said it couldn't be done were simply replaced by those who said it could—and then did it.

There is another limiting factor in design—far more common than industry is willing to admit. This limiting factor is the "brass hat" influence. I have talked with many designers who have said apologetically, "It's a 'brass hat' design; don't blame me, I'm not proud of it." A designer thus restricted must not only create a product that he knows has consumer sales appeal, but also one that pleases his client. If the client turns out to be—as is the case with many large corporations — a board of directors, dominated by political and family interests, he soon finds that he not only has to be a capable designer but also a superb diplomat.

It should be realized that the average executive does not see his product from the same objective viewpoint that his customer does. He may have personal preferences in color and design that are quite divorced from market preferences. He may intensely dislike blue or yellow or green, though these particular colors might be far the best for a given application. He may be so proud of the old trade-mark his grandfather designed that he refuses to change it, even though, from the standpoint of consumer acceptance, its value is completely negligible, if not entirely harmful. Last but not least, many executives like to feel that in some measure it is *their* design—that they had some part in its creation. This last impulse is so great in many clients that the clever designer will encourage everyone from the chief engineer up to the chairman of the board to think that without their ideas and help the product could not have been born or achieved success. After all, this takes no glory away from the designer and it generally achieves his aim—namely a product that sells!

Many executives, in evaluating a new product design, habitually approach their analysis of the design from the negative point of view. They ask themselves, "What's wrong with it?" instead of "Can we improve it?" I have actually seen engineers who were completely unhappy if they couldn't find something wrong with a design—a feeling that is born basically of their desire to be creative—to improve the product. After all, *the consumer does not look at a product from a negative viewpoint;* quite the contrary. He views it from a positive viewpoint. His primary questions are—"Can I afford it? Is this the best one? Does it do the job? Am I getting the most value for my money?" These questions are not destructive, nor conceived for the purpose of finding something wrong with the product. Rather, these are questions which seek *positive* comparisons of the product with other known dollar values.

Too many designers, engineers and executives are "object-minded" rather

than "relation-minded." They see only the small mechanism or specific product on which they are intimately working rather than appreciate that mechanism or product in relationship to its ultimate environment. For example, an engineering department might work many months perfecting a new automatic electric toaster without anyone's ever asking "Is it truly distinctive in comparison with other toasters on the market?" *The consumer always sees a product in relation to other products since he is seeking value and has a choice.*

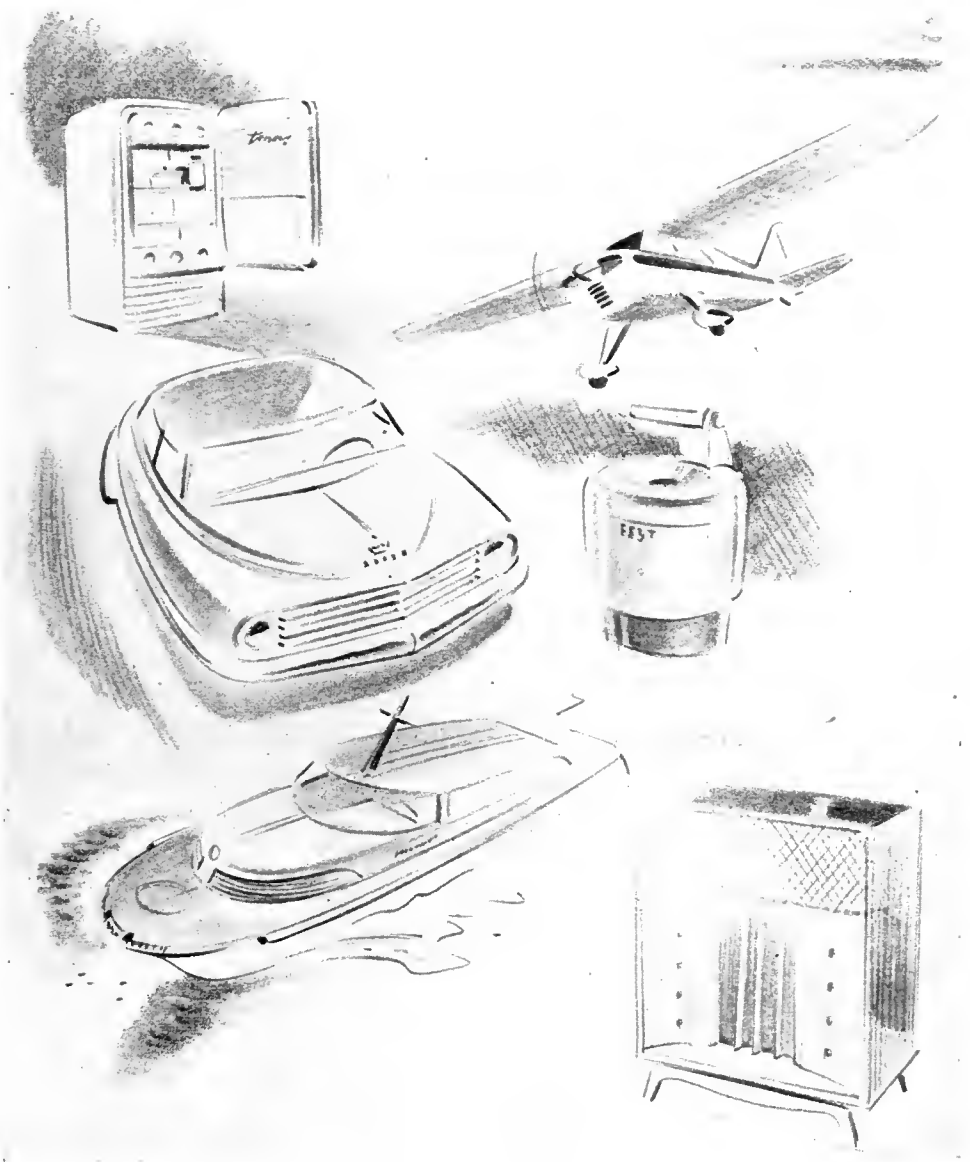
Therefore, the wise executive always sees his own product, his own marketing and advertising *relatively* rather than *objectively*. The greatest value in retaining an independent professional industrial designer is that he is relation-minded rather than object-minded.

The industrial designer's ultimate job is to view a product through the eyes of the consumer and to guide his client to do likewise. Since the designer is an expert in merchandising as well as design, there will always come a point where the client must have confidence in the designer complete enough to accept his word as final. A designer who cannot accept this responsibility does not deserve to be called in as a consultant. I do not think that any executive, no matter how domineering, would want to retain a designer who was simply a "yes" man.

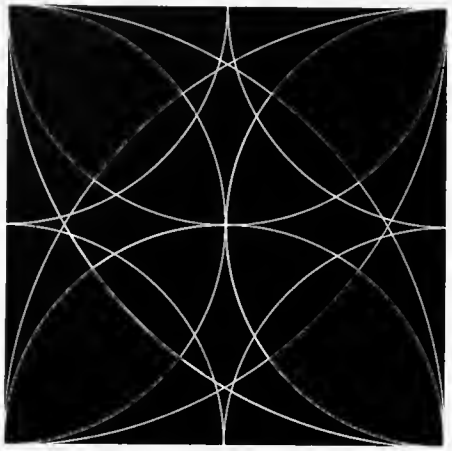
I have found that by far the best means of keeping executives enthusiastic and cooperative is continually to compare the proposed design with competition. After all, it is somewhat like designing a small newspaper advertisement. The layout for an ad may look attractive, all dressed up in a fancy mat and hung on your wall, but when you see it in the newspaper, surrounded by other advertisements, it appears entirely different. Thus a radio, a refrigerator or a package of tooth paste looks quite different surrounded by competitive products on the dealer's shelf or on the display floor than it does alone on a pedestal in the top executive's office. Executives should continually bear in mind that the *point of sales appearance* of a product is the one that counts, as far as the customer is concerned.

In working toward a more scientific method of style selection, the designer can learn much from the advertising agency — a specialized team skilled in building and determining consumer demand. Advertising copy is no longer based on hunches; it is carefully checked for reader interest.

When styling is likewise guided by consumer research rather than by personal tastes, when careful surveys made in the field are used to prove consumer demand before mass production, the era of "brass hat" design will have passed. The industrial designer will be able to forecast the acceptance of a new style as closely as the advertising agency can predict the success of a new campaign.



One of the outstanding talents of the industrial designer is his versatility — having worked on many products, he is familiar with all important materials and their methods of fabrication. This versatility means fresh, creative thinking and, when augmented by the ability to visually express new ideas, becomes the first step in creative product development.



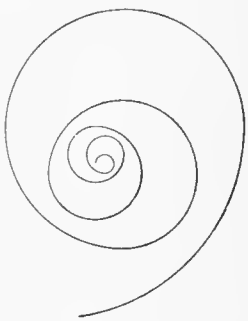
The Elements, Principles and Attributes of Design

The talented industrial designer can tell you not only *when* a product is styled right but *why* it is styled right. For too many years the *reasons* behind art and good design have been misunderstood by the public. Good design doesn't just happen. There are reasons why a design is good or why it is bad.

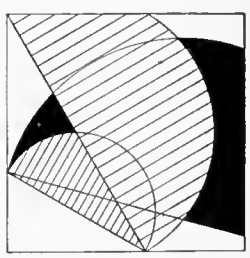
To understand any given phenomenon, mankind has always attempted to establish units of measurement. In fact, the successful establishment of units of measurement is the very basis of mass production in society as we know it. Modern science can measure distance, sound, time, weight, energy, velocity and the like within astounding degrees of accuracy. But when psychology and human "feelings" toward art are under discussion, there have been no ready yardsticks for comparison. The result is that there are very few scientific means of describing a design. We have the Munsell color system, which thoroughly and accurately classifies color, and we have the spectroscope which breaks color down to its various wave lengths, thus defining a color with even more accuracy. But *to describe how a color will stimulate an emotion and what impression it will create in the eyes and mind of the viewer* – for this we have no yardstick and no unit of measurement on which to base an intelligent and scientific comparison.

Because there is no yardstick for the analysis of art, the average man in the street has simply considered art as an emotional or esthetic expression and has let it go at that. *He either likes it or he dislikes it, but rarely knows why.* Because there have been no readily understandable units of precise measurement, artists have never been able to agree even among themselves as to the various elements and characteristics of design. It is not surprising, therefore, that artists have been misunderstood and often unappreciated by the layman. The cruel sufferings and torment of a great artist like Vincent Van Gogh were due to the fact that the average man has never considered mere painting nor the writing of poetry and other esthetic expressions as "work." It isn't work, in the ordinary economic sense of the word, because its economic value is difficult to measure and it is dealing in complete intangibles.

However, the *elements* of design *can* be delineated and set forth in a manner that can be appreciated and understood by anyone. It is the application of these elements and the degree of their sensitivity and relationship that determines whether a design is good or bad. We can define the elements of design in the same manner one might define basic chords and progressions in music, but note that *only skilful and creative integration of the elements of design can create a work of art.*

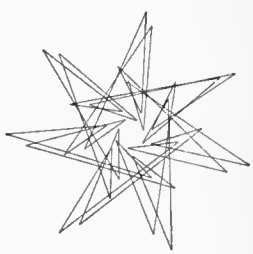


The author had the interesting experience of studying with Joseph Shillinger many years ago. In his studio, musical and rhythmic motifs were turned out by means of mathematical manipulations with very stimulating results. Mathematics applied to art will convince anyone that the number of possible designs is infinite and as such these abstract expressions are dynamic and absorbing. *However, it takes human feeling and emotion to select the good designs of pure mathematics from the poor ones* (poor ones being those which cannot be appreciated by man with his present degree of sensitivity.)



The engineer, as well as the executive, acutely needs to understand the language of art, for the engineer, executive and designer must collaborate closely to put a successful article on the market. The engineer's training is largely in the sciences, all of which have accepted standard units of measurement. For example, when the engineer thinks of distance, he has inches, feet and miles in mind. When he thinks of weight or mass or sound, he conceives pounds or grams or decibels.

But in art he feels lost, because art seems to him to offer no such exact scale. Yet the fact is, art does have its units of description which an engineer



Designs based on mathematical formulae.

Ewing Galloway

may readily understand. For example, one element of design is color, and color is made up of wave lengths which can be registered and recorded. Color in the Munsell Color System has been broken down into its basic elements and classified so exactly that a designer may specify a color in a typewritten letter, send his specifications — without swatch or sample — to several different manufacturers and be sure that, if the specifications are respected, all color samples in a given material will match.

In any case, the act of *defining the basic elements of design* will take some of the mystery out of "art" and bring the subject down to a common basis for discussion and understanding. There are definite reasons why some designs appeal to us and others do not. These reasons may be described even though they cannot be accurately measured.

Dr. Peter Schlumbohm, designer

All creations of mankind are subject to design, whether they be the largest structures of our modern cities, or the small objects that play an important part in our daily living. Despite the differences in scale and function between Radio City and a glass coffee-maker, both are subject to the same laws of design and may be critically studied in the light of art fundamentals.

There are seven basic conditioning factors of design

ECOLOGY

TIME

FINE APPEARANCE

ECONOMICS

FUNCTION

MATERIALS

TOOLS & PROCESSES

Each of these factors influences the design of any and every product of mass or handicraft production for all time.

Let us consider the first: — **Ecology** — or man in relationship to his environment. The average man living in Arabia would want entirely different products than we want here in the United States, even though he is living at the same time as we and might have the same amount of money to spend for a given product. His environment has conditioned his thinking, his needs and his tastes. Therefore, ecology is one of the conditioning factors of all design. **Function, Materials, Tools and Processes** all influence design and have been basic elements outlined in this book. The careful consideration of materials used and the methods of manufacture determine a good product. **Economics,** of course, is an additional conditioning factor because the product to be successful must sell.

Time in the historical sense has conditioned products throughout the ages—*and here one must remember that "modern" always means contemporary*. However, in the immediate sense, "timing" is particularly important in designing a product of maximum appeal. Timing means an awareness of the immediate market demand. Many products are successful when timing has been well handled. The clothing industry, for example, in appealing to the younger American generation relies largely on timing, in order to appeal to collegiate and high school fads. Wrong timing can mean a severe economic loss. Many other products require timing in order to hit the seasonal markets, such as Christmas. Here, not only product design but all advertising and merchandising must be timed for maximum effectiveness.

Thus we see that with the inclusion of **Fine Appearance** there are seven basic conditioning factors of design and these factors were as effective in the days of Leonardo da Vinci as they are today.

In addition to these conditioning factors of design, we should realize that visual design itself is made up of several **elements, principles** and **attributes,** all individually definable and explainable.

Artek-Pascoe

Elements of Design

Lines—*edges*

Planes — *surfaces*

Solids—*mass, volume*

Color—*hue, value, chroma*

Texture—*structural arrangement of materials*

Space — *areas of intervals between parts*

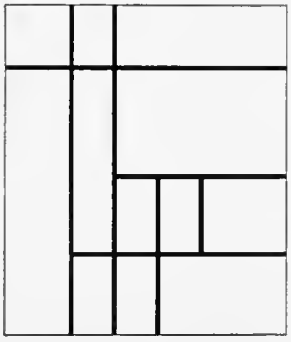
Repetition—*alternation, radiation*

Principles of Design

Opposition—*variation*

Transition—*sequence*

Position—*relation*

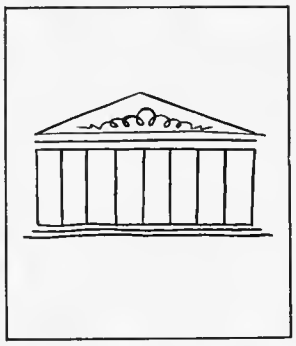


Mensuration—*domination, subordination, collection, isolation*

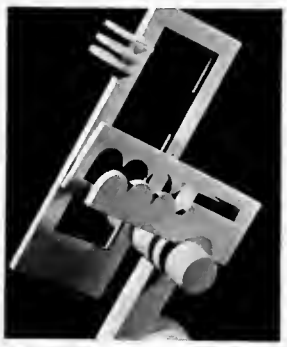
Attributes of Design

Abstract designs by students of Pratt Institute

Orderly Directed Movement—*rhythm*



Relationship—*harmony, proportion*



Balance—*formal, informal*

Emphasis—*significance, distinctiveness*

Unity with Variety

Any work of art, whether fine or applied, from any era, can be critically analyzed on the basis of these **elements, principles** and **attributes.** It is particularly interesting to take a design such as Abstraction #I on the following page. This abstraction, made in a few hours by a student at Pratt Institute, can be critically analyzed on the basis of the criteria above as follows. It is a crisp, tectonic form where **lines** and **planes** have been accented. The form, however, appears to have the **mass** and **volume** of a solid because of the relationship of the planes which, placed at right angles to each other, suggest a solid. **Color** was not used in this design but easily could have been, and would have enhanced the effect. For example, a dominant color on the center circle would have provided greater variety and increased the unity of the design. **Texture** is not a prominent part of the design, although the eggshell surface of the cardboard provides an interesting play of light. Perhaps the most interesting and fascinating part of this abstraction is its use of **space.**

Here we have considered the elements of design. All the basic elements have been used and used well with some more dominant than others. Now let us consider by what principles of design something of interest has been achieved. There is subtle **repetition** in this form. Note that the center disc has been cut from the outer ring. This means a common space relationship between the two, giving them a common bond. Repetition is one of the most common principles of design in all forms of art and music. It is not a dominant part of this design but it is present.

Opposition, providing interest through variation, is very apparent with the two basic planes of the design being at right angles and the third plane being at an obtuse angle to the horizontal. A simple, orderly **transition** of sequence is apparent in the basic three planes. The **position** of the entire mass relative to the supporting base lends dynamic interest to the whole abstraction. From the standpoint of **mensuration** the design has definitely been built around domination. A forceful "bull's eye" holds the design together and gives it unity.

Attributes of design show a definite sense of **rhythm,** a good use of **proportion,** an informal **balance** with **emphasis** provided by sharp contrast in value and clear lines. Certainly the above-mentioned abstraction has genuine **unity with variety.** Thus we see that point by point the abstraction may be studied to weigh critically its value as a work of art; and while the design in no sense may be accurately measured as to its excellence, *at least there is a common ground of understanding through the delineation of the basic elements, principles and attributes of the design.*

Abstraction #1

Abstraction #2

Compare Abstraction #2 with the first, and note the strong feeling of solid form, relieved by crisp lines and edges and the interest that is created when the sphere near the top is abruptly interrupted by a vertical plane. This form can be studied in all its basic elements of design for many months without becoming tiresome. It is infinitely interesting and stimulating. It certainly shows the value of abstract design as a refreshing means of art appreciation.

Photograph #3 shows a recent automobile. It may be as critically analyzed as were the two abstractions, and indeed offers further studies in the light of the conditioning factors of design. For example, if its timing is off or, from the economic standpoint, if its price is too high, it will not sell. If the esthetic solution is not adequate, it will be improperly styled and fail as a piece of applied design. Note the use of crisp lines in repetition in the radiator grill as a means of overcoming the monotony of plastic body forms. The opposition of various masses and planes in this design has provided interest in variation.

Photograph #3

One of the first steps toward true art appreciation is the increased sensitivity to the language, the philosophy and the elements of art. Good design is the sensitive expression of subtleties; the difference between a truly fine design and a mediocre one is not glaring or obvious but rather sensitive and finely detailed. Most people feel these subtleties and with a critical analysis there is no reason why they cannot be described, even though they cannot as yet be measured.

The Human Being in Basic Planning

Creating a successful product or service is not easy. It costs money and there are many failures for every success. The primary reason is that so many complexities enter into the design and marketing of a product that few people have the talent and the judgment required to make the series of essential right decisions. Very often large projects are undertaken and investments made before a very simple but critical question is asked—"*Why make it all?*" This question is not as foolish as it may seem.

There are many products that belong in the "why-make-it-at-all" class. Most business men in this country can point to government policies with a "why-do-it-at-all" query. Too many products are conceived merely because someone had a hunch—an idea. It is important to realize that the right idea comes up less than once in a hundred times. This country is full of inventors with ideas. We as a nation are ingenious, and ideas are a dime a dozen. *It is the ability to weigh and critically analyze an idea, to plan and scheme and develop it, and above all, to merchandise it, that makes that idea worth money.*

From the standpoint of sound planning, if you have an idea for a new product, your primary and first question should be, "Should we make it at all?" In other words, is it *really* a worthwhile idea? Is there really a market for it? To help you guide the development of your product or service, here is a short check-list. If you will answer each question in relation to the proposed design, you will find the check-list brings up a lot of thought-provoking questions. You will also find the check-list is stimulating in suggesting new applications and new varieties of design. Of course, the basic purpose of any check-list is to make certain that no important phase in your product-planning or merchandising has been overlooked. These points are fundamental, whether a firm manufactures shredded wheat or locomotives. *They show that the basic thinking in art and merchandising encompasses all of the products mankind uses and needs.*

Check-List for Product Planning

Sensory Aspects

1. Vision

Elements of design—lines, planes, solids, color, texture, space
Principles of design—repetition, opposition, transition, position, mensuration
Attributes of design—rhythm, harmony, balance, emphasis, unity with variety

2. Touch

hardness, elasticity, temperature, texture, weight, balance

3. Taste

desirable, repulsive, neutral

4. Odor

desirable, repulsive, neutral

5. Sound

harmony, dissidence

The Need Aspects

1. Who

manufacturer	*man*	*rich*	*North*	*race*
consumer	*woman*	*poor*	*South*	*creed*
distributor	*boy*	*middle-class*	*East*	*color*
jobber	*girl*		*West*	*nationality*
advertiser	*animal*			

2. What

device
service

3. When (Time)

interval — second, minute, hour, day, month, year
duration or placement — "timing"

4. Where

location
relativity

5. Why

reason for being
results of being

The Desire Aspects

1. Value (Real)

initial cost	*indirect cost*	*comfort — mental and physical*	
maintenance	*liabilities*	*salvage*	
operation cost	*time saved*	*function*	*quality*

2. Psychology (Distorts Value)

habit	*good will*	*affection — gifts*
superstition	*reputation*	*pride*
tradition	*style*	

The Instinct Aspects

hunger	*fear*	*love*	*anger*

The sensory aspects of design are very vital to planned product development. Note that most products are bought on appearance (vision) and yet it is very important to check the other four senses to see that a product has been *completely* designed to be in harmony for all applications. A chair might be visually designed to look smart with a fine use of line, color and texture. However, if it is uncomfortable to sit in, it certainly is not a good chair and its sales would be limited. A bar of candy might taste "out of this world", but if its color does not stimulate taste-sensation and if it is not in a package aimed to encourage that sensation, it has limited its sales opportunities.

Odor is one field that industry has considered only recently. Such everyday products as silver cleaner, soap flakes, floor wax and many others should all be carefully studied from the viewpoint of odor to see that they have maximum sales appeal. Odor and color always go hand in hand, and certain smells will suggest certain colors even to people who are blindfolded. It is not enough that coffee, for example, have a savory odor — it must also have the right color. This color sensation can be enhanced by putting coffee in a cup or package whose color is complimentary and appetizing.

In sound, industry has another opportunity to make remarkable strides. We know a great deal about sound through widespread research in electronics and acoustics, but as yet we have done little to stop the dissonance and noise of our large cities. One shudders to think what living will be like twenty years from now when every other person owns an airplane as well as an automobile. Manufacturers of electric appliances, typewriters, trains, and indeed, everything that moves should carefully consider reduction of noise and vibration. Product appeal can be increased greatly through the elimination of dissonant sound. The automobile of today is far quieter than the automobile of 20 years ago and this consideration has definitely increased sales. Certainly, noise is one of the prime reasons for decentralization of the city. It can lower land values, as the elevated railways demonstrated in New York.

This check-list of the sensory aspects of design is a particularly important one. *Every successful product or service, to attain its greatest sales advantage, should plan for maximum appeal to all five senses.*

Note that a successful product or service depends quite as much on its *satisfaction of a human need* as on the fact that it is well engineered, well styled, and well priced. There are many variations in human needs. A man often requires a different product than a woman or boy. A rich person has different tastes from a poor one. Failure to consider distributors' or jobbers' needs can often kill the sales success of a good product which the consumer actually wants.

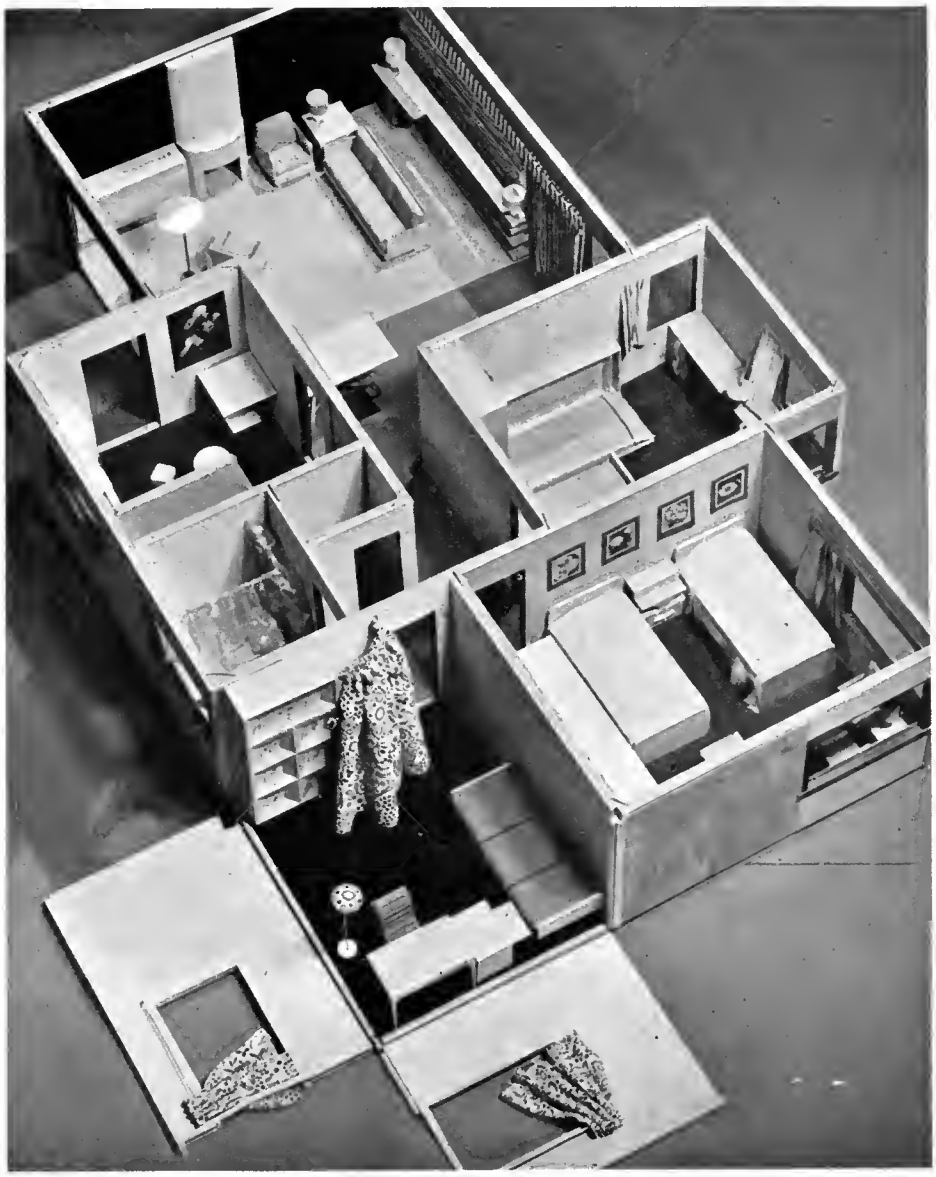
We should consider another aspect. After all, the world is full of human needs. There must also be *desire*. The building up of mass desires for new and better things has been the great contribution of advertising to the growth of the United States. A person desires a product when he considers it of *value* to himself. Note in the check-list that value is made up of diverse and varied elements — many of which escape the attention of the consumer and manufacturer alike. For example, the American market has usually considered *initial* costs as being more important than *operational* costs, as contrasted with the European buying psychology whose emphasis and thinking is just the opposite.

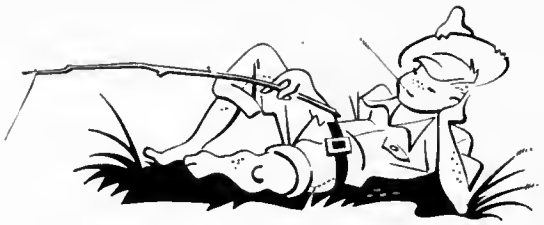
However, it is important to realize that *the consumer seldom buys on real value alone*. In nearly every purchase we make, we also find ourselves influenced by psychological or imagined values. For instance, habit accounts for a great many of the things we do. This is one of the main reasons why it takes a tremendous amount of money and effort to build up a new business and, once it has been built up, it can coast along for years and

Steuben Glass, Inc.

In order for a product to attain wide consumer acceptance, it should be carefully planned to appeal to all the human qualities that stimulate the desire for ownership. This is true whether one is planning a line of modern glassware or a prefabricated home. The understanding of human needs and the current trend of consumer buying tastes is an important contribution that the talented designer can make toward creating a more successful product or service.

Pratt Institute





survive in spite of incredible mismanagement. Habit and tradition are the inertia and the momentum of business. Yes, *momentum*. Even in this day and age superstition may influence sales. More than one sales manager has wondered why a product can sell like hotcakes in one section of the country and be a complete failure in another. Field investigation often discloses the fact that tradition, habit and superstition have a very profound influence on regional consumer acceptance of a product or service.

It is interesting to take any product or service and go over these desire aspects point-by-point. I have seen just such a simple study change the whole course of product-planning and result in a far more intelligent design and more successful merchandising.

Our characteristics as human beings are the heritage of many centuries of evolution, and our instincts also influence product acceptance. These instincts are hunger, fear (self-preservation), love (procreation and sex instinct), and anger. These four fundamental instincts are the basis for much skilful product design and merchandising. Deodorant advertising and merchandising appeal primarily to the *fear* instinct. It goes without saying that the best in food packaging always appeals to hunger. This is the reason why, in recent years, the labels on many foodstuffs look so tasty that one's gastric juices start functioning, thus stimulating impulse buying. Cellophane has enjoyed tremendous popularity, because its transparency allows the product itself to be seen and stimulates the instinct of hunger. The tremendous growth of our cosmetic and clothing industries have been based on the *sex* instinct, and *anger* is soothed by the modern merchandiser with "the customer is always right"!

Never forget that *human beings,* Mr. and Mrs. Average American, with all their hopes, ambitions, talents and failings, are buying your product or service. Psychology, the basic understanding of people, must guide product development and merchandising. As our "know how" in production increases, our industrial capacity expands, so only this understanding of the *consumer himself as an individual buying unit* can assure a favorable competitive position.

Abstract Art Influences Industrial Design

Picasso, courtesy Museum of Modern Art

The outstanding talent of the industrial designer is his creative sense of style and design, which he utilizes effectively to apply esthetic principles to mass production. Although he requires effective knowledge in merchandising and engineering, *primarily he is an artist.* He is an artist in an era of high mass production, but nonetheless as sensitive an artist as one usually finds in the field of fine arts. The distinction between the fine and the applied arts is so small that I, for one, am inclined to think no distinction whatever should be made. I know many talented industrial designers who find relaxation and stimulation in turning to water colors of still life and countryside vistas. Incidentally, they are excellent water colors, too. The designer's great contribution to industry is his creativeness and his appreciation of esthetic values.

Art is a living, changing thing even as is science. Today we are going through an amazing period of scientific advance in which research yields a steady stream of new discoveries. The man in the street can neither evaluate nor comprehend the work of a research chemist in his laboratory, yet within a few years the very essentials and comforts of that man's existence may depend upon the creativeness of that chemist's work today. We are also experiencing a parallel advance in the arts. Although the man in the street cannot appreciate the modern artist's exploration into new things, he can understand and appreciate current advertisements and products whose design was based on the artistic explorations of a few creative pioneers.

Modern art, and particularly abstract art, is exploring in the field of visual and sensual emotions just as the modern chemist or physicist is exploring in the realms of finite matter. The average man's inability to see an immediate application or use for a new art expression is no reason to criticize it adversely. Many a new chemical has been discovered as a by-product of other research and has existed in the laboratory for years before someone stumbled on an important use and application for it. *Research in art is just as essential for industrial growth as research in science.*

Our large industrial corporations, which are spending many millions of dollars on research, purposely do not tie the hands of their creative researchers beyond some definition of overall project aim. The modern research chemist and physicist follow out projects, guided primarily by their untiring interest in the unknown. So it is with the pioneers of art—they work creatively toward new goals which are seldom appreciated by their contemporaries. We, as a nation, have accepted the need for scientific

research because the fruits of this effort have amply repaid the nation and the industries conducting this research.

Now it is time that we realize there can be just as rich fruits from research in the arts, indeed, as a nation, we need this research even more. We lead a high pressure existence, producing more and more things, which often seem to result in fewer and fewer leisure hours for the appreciation of beauty and life itself. Research in the arts can result in better and happier living — which certainly is as worthwhile an objective as two automobiles in every garage.

Research in the arts springs from the same internal source as research in the sciences—*the eternal desire for new expression.* Great pioneers in the arts led lonely and often penniless existences. They were usually friendless because society, as a whole, is not creative and pioneering, nor has it appreciated the need for genius. The lives of many great artists and many of our famed inventors and scientists are surprisingly parallel in that both groups were unappreciated and both were often persecuted. Artists and inventors have too long been considered the "screwballs" of society. Actually, they are the lifeblood of our progress and, when nurtured and encouraged in their expressions, as they have been in the United States for the last thirty years, they contribute tremendously to the improvement of everyday living standards.

It is not surprising that the sciences have been nurtured by Americans to a far greater extent than the arts, especially the *creative* arts. As a nation, we are just awakening to the fact that we have creative artists of our own as fine as any in the world. We no longer need to borrow the styles of the past because of a lack of confidence in our own creative expressions. A study of the older arts, of course, is essential as a background for richer experience and appreciation. *However, art appreciation is not as dynamic as art creation and it is in this field that we are just beginning to grow.* We must put our truly creative and pioneering artists in an environment where they can create as free from economic worries as the modern researcher in an up-to-date laboratory. Modern art requires tools and media for expression even as does modern science. All basic thinking is a product of the creative mind but before it can be developed and appreciated by others, it needs expression, and expression takes time, materials and money. This can come only when we realize that our growth in art is just as important to the nation as our growth in science *and allocate proportionate sums of money to stimulate this creative advancement.*

Picasso, courtesy Museum of Modern Art

Jens Risom, courtesy H. G. Knoll Associates

Paul Lester Wiener, Architect

Abstract art does influence industrial design. The "Seated Woman" by Pablo Picasso, done in 1927, is an early example of inter-penetration and flowing "amoebic" form. This use of free form to relieve the hardness of tectonic structure has been one of the distinguishing features of modern architecture and interior design.

Pioneering and research must be continued in the fine arts in order that fresh, new style may continue to develop in the applied arts. Industry should be aware of this great need for a fountainhead of art inspiration.

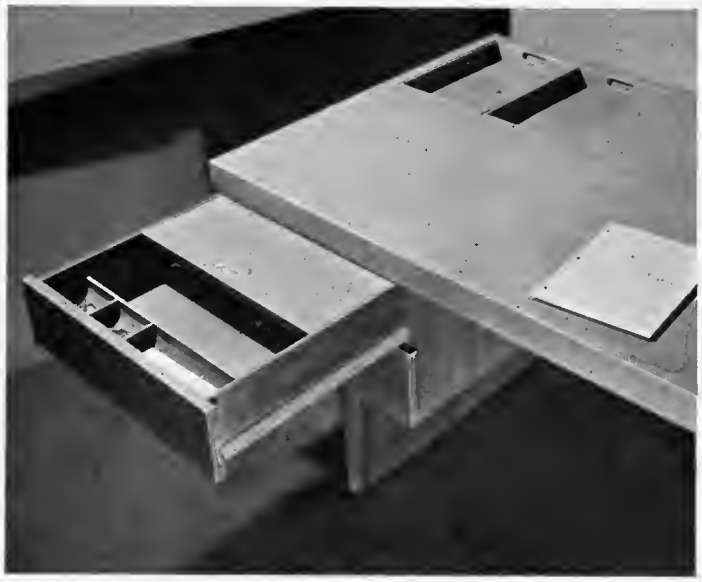
Art applied to industry finds its primary stimulation in the fine arts. This is not surprising since the fine artist—because he is uninhibited by sales and production limitations—can be *truly creative,* can seek new expressions with complete abandon. These expressions cannot be turned on and off like water from a faucet. They are impressions, fleeting and precious. They are built upon moods. They are stimulated by environment. The artist may create something finer in one morning than he does for the rest of his useful life. He is always on the threshold of discovery. Reaching for new things in art is not as easy as it looks to the layman whose insensitive eye might criticize the expression as doodling or dabbling. *It is surprisingly difficult to come up with something truly fresh in design and the purely creative artist working in abstract design is, in reality, the prime mover of nearly all the expressions of the industrial designer.*

In return, the artist himself is influenced by the mass production of industry. Many of our modern artists have painted their feelings and sensations of modern living. Their reactions impelled them to develop new expressions which years later may appear as motifs and designs on commercial products. The basic point is that the arts of industry and mass production are primarily stimulated by the expressions of the uninhibited fine artists. Therefore, if, as a nation, we encourage and nurture these artists, we will have for the next generation better products and better things in our daily living.

As pointed out in earlier chapters, there is no ready yardstick for art—in fact, there is relatively little even of a common language. Ask any two artists what they mean by *form* and you will be provided with a whole evening's heated discussion because to one artist form means one thing and to another it means something entirely different. On the other hand, ask any two scientists what *mass* is and you will find a precise answer even though one of the scientists speaks only Russian and the other Portuguese. Science has a valuable asset in that it can be readily *measured.* As a result, the fruits of science are far more tangible to our large corporations which are underwriting the major costs of scientific research in this country.

The arts, on the other hand, are almost entirely *intangible.* Why one particular painting should be selected out of a museum full of paintings as being universally outstanding is a difficult thing to explain. One can carefully study such things as proportion, form, color, technique but ultimately it comes down to a simple fact. One "feels" it is great and, in the arts, greatness is often the impulse of instinct rather than the judgment of reason.

Walter P. Margulies



The severe and yet subtly balanced abstractions of Mondrian have greatly influenced the formats of modern publications. His generous use of white space and asymmetric layouts provide interest and variety which have greatly stimulated modern advertising. Even the desk above has a rhythm and pattern suggestive of the work of this great pioneer in the abstract arts.

Mondrian, courtesy Museum of Modern Art

Greenbaum, courtesy Whitney Museum of American Art

Much of our appreciation of the abstract is based on our inherent sensitivity to the nude form. The flowing rhythmic lines of nature have been man's natural environment, and therefore it is not surprising that he applies this feeling to his expressions in abstract creation.

And so, because the arts are an intangible, they have been overlooked by "practical" people. America as a young, raw-boned, rapidly growing country was far more interested in producing the necessities of existence than in the finer subtleties of living. When some people did accumulate sufficient money so that the struggle for existence ceased to come first, they imported "culture" from the older and more mature countries across the seas. In our country's early days we conceived culture as something that could be bought like Dr. Eliot's Five Foot Shelf of Books. Now that we have reached maturity and find ourselves in the role of world leadership, we are beginning to realize that *culture comes from within,* and therefore, our arts must be truly creative and truly *our own.*

This book has shown that *art has actual, tangible economic value* when applied to industry, whether it be on the magazine page, in a new appliance, or in a radio play. Thus, it is sound reasoning on the part of industry to see that the foundations of creative art are encouraged. Right now industry is not doing this. The textile industry, for example, buys patterns at a few dollars a sketch and hopes that the art schools will furnish talent. Yet designers are the very lifeblood of the textile industry. If we want to be world leaders in textiles, more creative design is one of our foundation stones.

Brancusi, courtesy Museum of Modern Art

This abstraction suggests some of the sensuousness of female form, but in addition has heightened variety and interest through the use of intersecting planes providing crispness and emphasis. It is a satisfying form to feel as well as to observe.

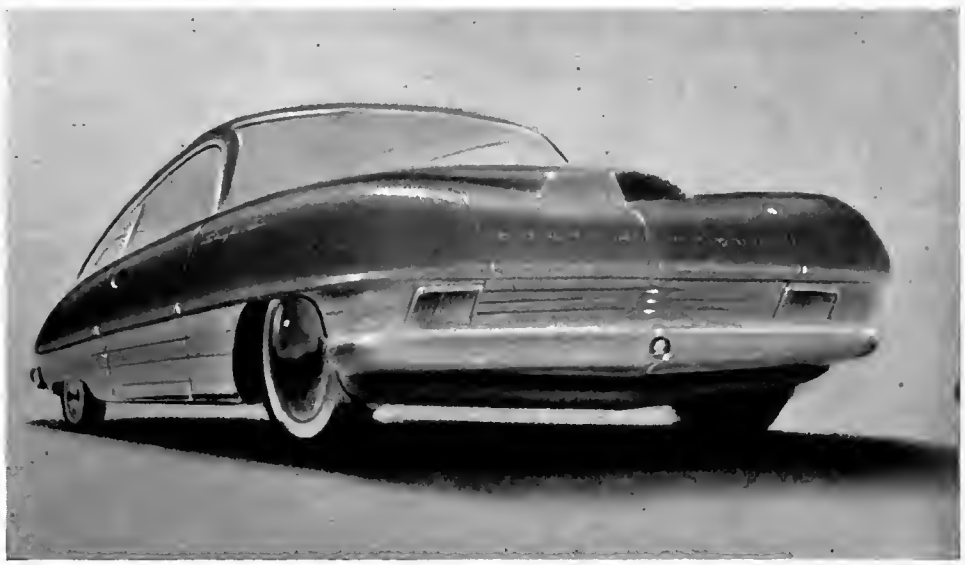
Abstractions such as these do influence the industrial designer because they stimulate his creativeness. The electric toaster below is comparable in scale and mass but cannot compare in sensitivity or in lasting qualities of design. Art will be better applied to our products of daily living when it is more widely recognized and appreciated in its purely creative expressions.

Balla, courtesy Museum of Modern Art

The industrial designer is often faced with a specialized task such as suggesting motion. This has been admirably solved by Giacomo Balla and has been given new expression in the high-speed camera of Gjon Mili. This feeling of motion and organic rhythmic movement is expressed in the styling of a modern motorcar or a jet propelled airplane. Freshness in style can come through a careful study and appreciation of movements and rhythms in Nature.

The problem, however, does not lie wholly on the shoulders of industry. Our schools, colleges and universities must take over much of the burden. *Above all, they must emphasize the importance of creative art as contrasted with the mere copying of past forms of historical study and appreciation.* Let no one take this to mean that a knowledge and appreciation of past art is unworthy or undesirable. Study in Europe is still an excellent foundation for increasing the vision and scope of any artist. The emphasis, however, should be put on looking forward rather than backward, and above all, on *creativeness* of expression so that new art forms will be born. Our colleges and universities cannot encourage this quality unless they have inspiring teachers with this vision, and unless they are adequately financed. *The job of industry is to provide the financing, and in future years it will be repaid many times over.*

Our large corporations have established scholarships in our leading colleges and universities in order to find better engineers, scientists, and business men. They have given universities costly research equipment. They did all this because they knew it paid dividends in supplying them with the fresh young minds so essential to the future growth of the corporation. Industry must now realize that the same thing holds true in the arts. The establishment of scholarships, the providing of better equipment and higher paid faculties will result in more talented graduates who can be absorbed by industry, and in more creative artists who will influence design within industry through the years to come.



Moore, courtesy Museum of Modern Art

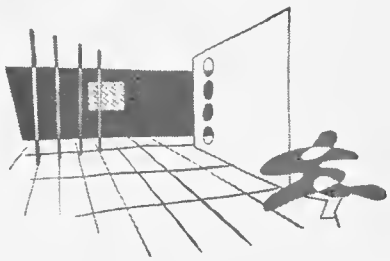
The absence of matter is just as interesting to the eye as the presence of matter. Indeed, it is the subtle play of the finite against open space that provides one of the outstanding characteristics of modern architecture.

Abstract art should not seem too strange since we are all continually surrounded by it and *use the abstract arts of earlier civilizations in our daily living*. For example, the evolution of our alphabet started with early drawings of natural objects. Gradually, as these symbols were simplified, they developed into the alphabet as we know it. Take the letter "a", and you will find it a beautiful and interesting abstract symbol. We use this abstraction in daily living and think nothing of it. Likewise the modern artist, seeking new form and abstract symbols, is looking for fresh expressions that may be later adapted to commonplace living.

The industrial arts have always followed the fine arts. The foundations of modern applied art and architecture were the result of the action of impressionist painters in the last century. They expressed on canvas what they felt, rather than sought the reality of what they saw. The work of Van Gogh, Gauguin, Cezanne and other creative pioneering spirits toward the end of the last century left no doubt that art was a seeking of expression rather than merely a copying of nature. This break with tradition produced a flood of new, truly creative artists. It resulted in a complete departure from the expressions of realism, and caused the birth of cubism and abstract art as we know it today.

It is impossible for anyone to study the works of modern artists and forecast which trend will hit popular fancy in the years ahead, any more than one can forecast which book will be a best seller. Consumer tastes and fancy are hard to anticipate. Only this we know—that styles will change and that new styles will be based on the work of the creative artists of today.

This abstract symbol is familiar by common usage. It is highly legible because there is a good relationship between the body of the letter and the surrounding space. It is interesting and fascinating to the eye because of the variety in weight of line. It represents the creative talents of thousands of artists over many years of recorded history. Type is an abstract art that has been handed down to us through the ages and one that is going through continual modification.



Man Is the Modulus

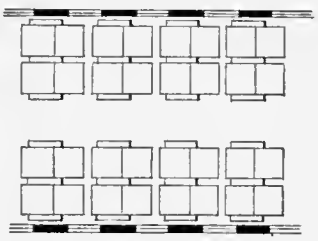
As design progresses, the specific needs of man are more closely studied and more adequately provided for. In product development today, we are carefully analyzing every phase of human living to estimate needs for improvement in product function and eye appeal. In designing an electric iron, for example, many models are made of the handle to make sure that the iron "feels" comfortable in the hand and does not tire the wrist. All such common items as door knobs, screw drivers, telephones, toothbrushes and many more are designed to fit the average hand as a modulus.

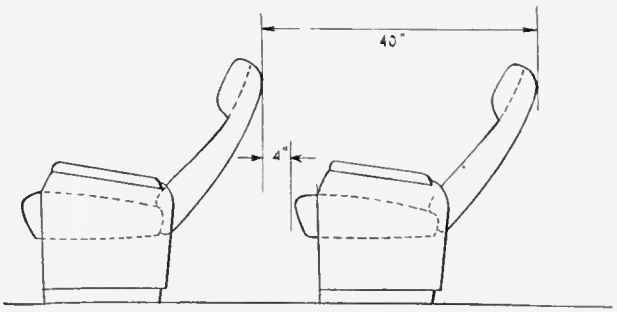
As our homes and apartments become smaller, adequate solution of space-planning becomes more important and this is necessitating a more critical study of human dimensions. An integrated kitchen is designed around the average housewife. The counter top is of such a height that she can work without fatigue. Dishes, silverware and glassware are all designed to the scale of the human hand for functional use. Milk bottles are designed not only to hold a quart, but also for easy pouring. The trend toward the storage wall and built-in furniture has resulted from a critical study of the things we use and the amount of space they should occupy for more useful and efficient living.

Industry has spent large sums of money studying man as a modulus and is still learning. In modern air-transport interiors, for example, despite years of research no one has found a chair that is truly comfortable for a long trip and can yet be installed on 40-inch centers. It is not easy to design a reclining chair that will be comfortable for a woman five feet, two inches tall who weighs 115 pounds, and for a man six feet, three inches tall who weighs 230 pounds. In addition to the obvious differences in their weight and size, these two people also have different points of bearing and restings when supported in a chair. Furthermore, the most comfortable chair in the world, exactly tailored to your contours, will be tiring unless it is adjustable. People like to squirm. Research has shown that even in a feather bed the average person will turn over 20 or 30 times a night. Our knowledge of good seating is still surprisingly primitive.

In studying an aircraft interior, every appointment — the chair, the easy-to-reach ash tray, the adjustable reading lamp, even the luncheon service and eating utensils — is designed around the average human being as a modulus and requires continuous research for improvement. Comfort is based on the careful analysis of many little things. Our products and services have now reached such a high point of mass production that the cost of this careful analysis is relatively low.

Modern transportation is particularly demanding because of space limitations. A careful study of the human being can produce far more comfortable trains, aircraft and automobiles, and the same thinking may be applied to every product, whether it be a safety pin that is easy to open with one hand or a shredded wheat biscuit that is easier to bite.

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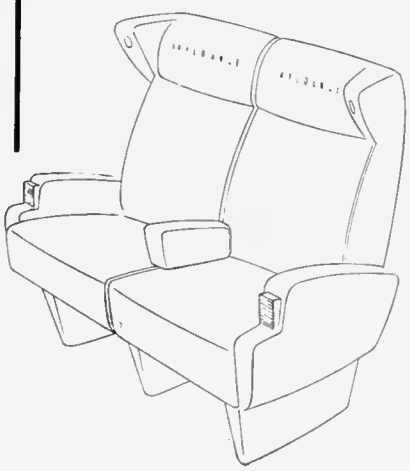
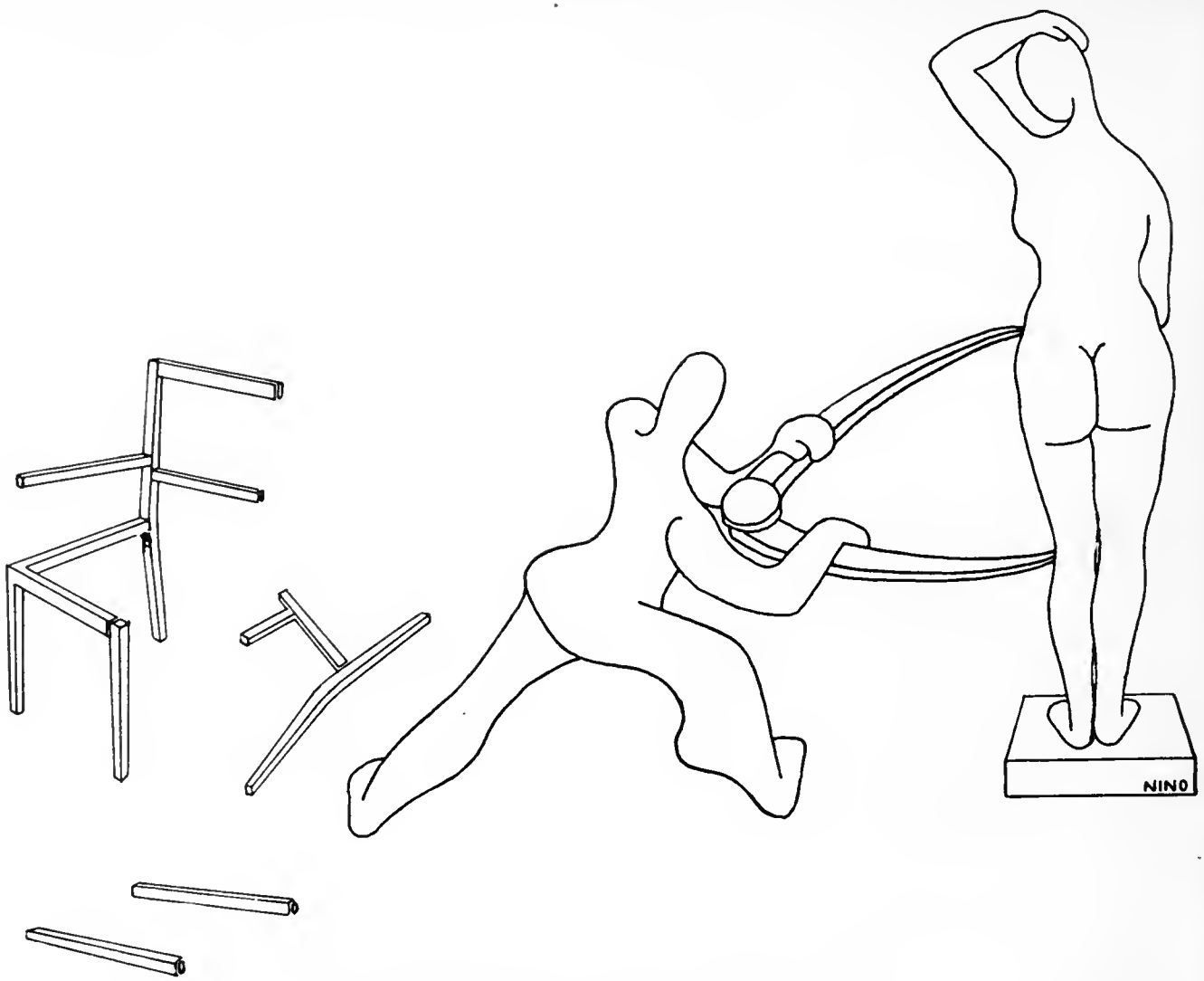
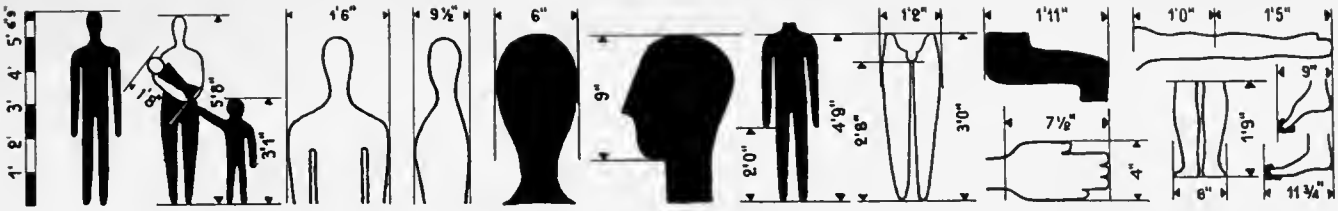


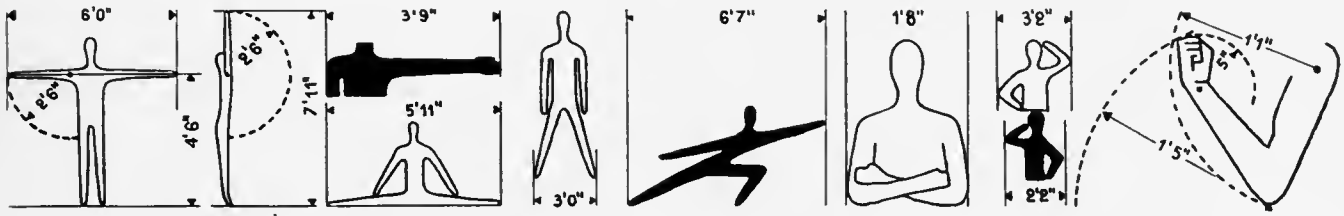


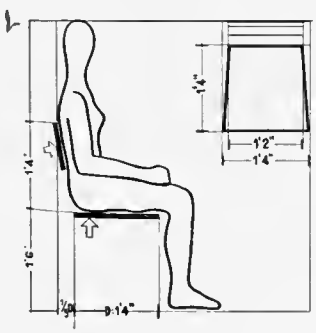
Courtesy of Interiors, copyright 1944, The Whitney Publishing Co. Sketches by Nino Repetto

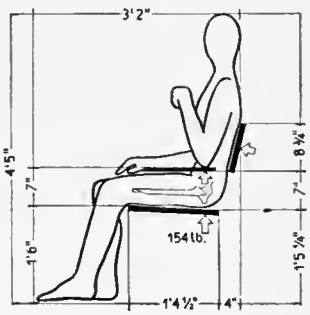
Man is the modulus of all things and a careful study of his dimensions can result in products that have greater usefulness, and therefore, wider consumer acceptance. Some industries have made very careful studies of average human dimensions — the shoe industry, for example, in the use of standard lasts which have made possible the mass production of shoes. Similar careful studies will produce better furniture and homes, more useful public buildings and more comfortable transportation.

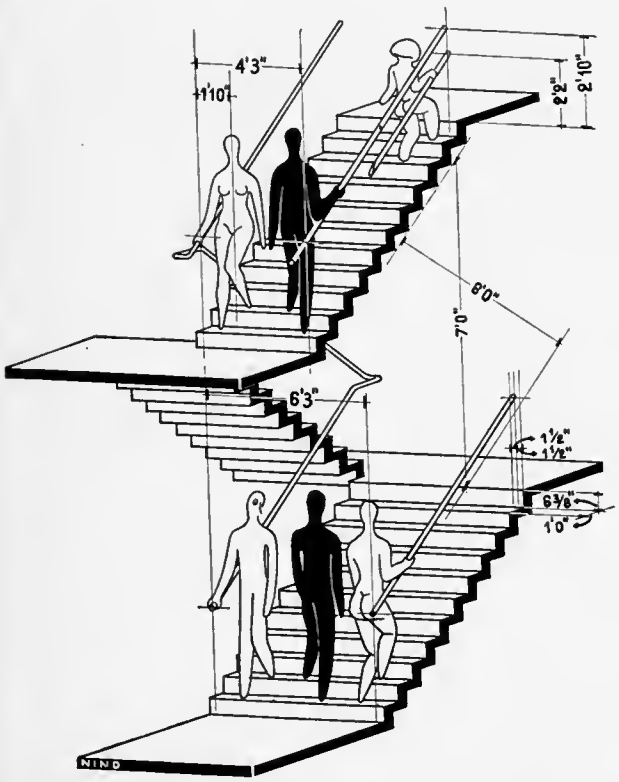
It is natural that the shoe and clothing industries have given the greatest thought to human dimensions, since it is the very basis of their business. As product development progresses in other industries, refinements to better fit human needs will continue to develop.





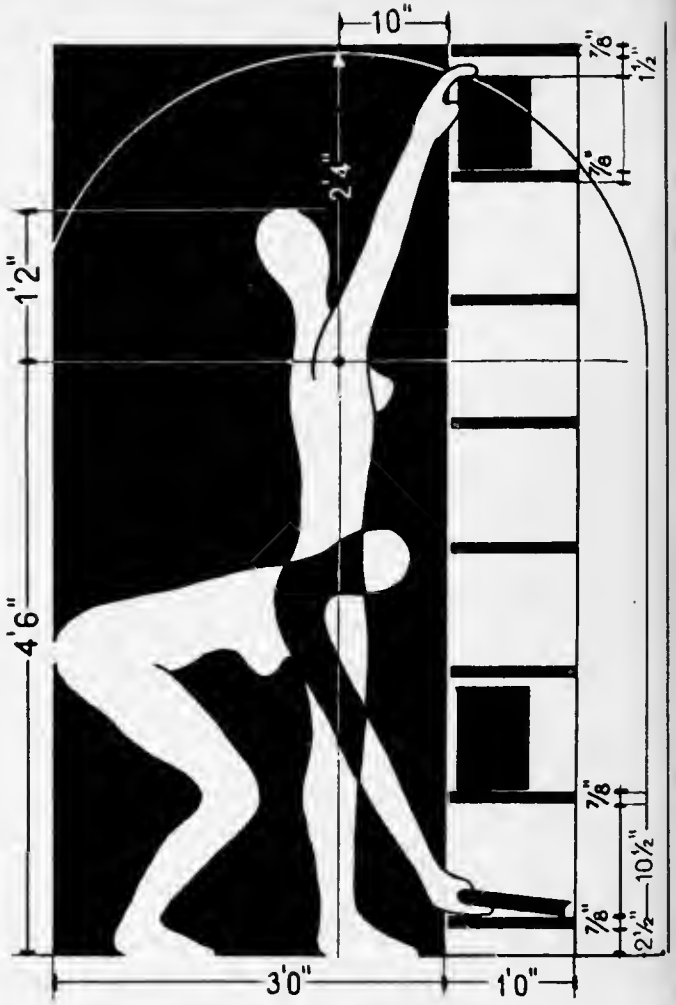






Courtesy of Interiors

Perhaps the greatest opportunity for the careful study of the human being as a modulus lies in the better planning of the prefabricated house. All the things we use in daily living are planned around human dimensions and their adequate storage must be proportioned accordingly.



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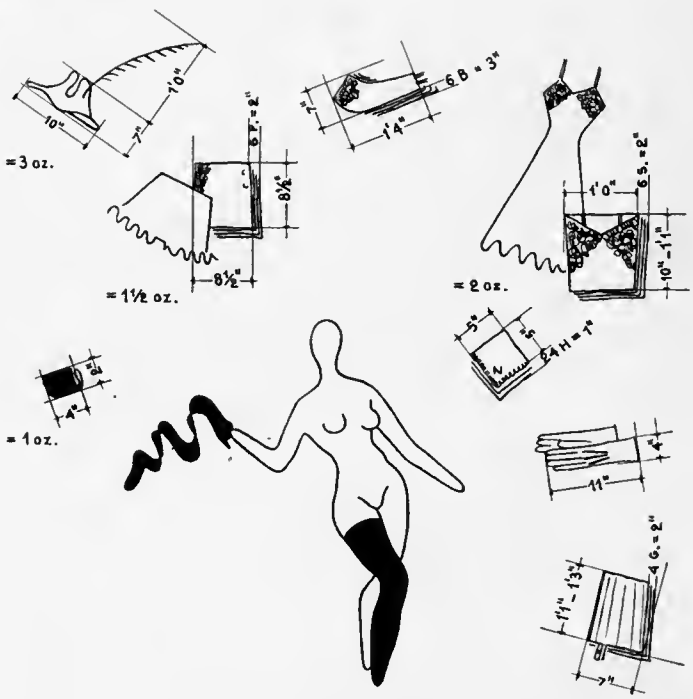


Scale in Industrial Design

One of the most important features of any successful design is the happy solution of *scale*. The decoration on the front of a locomotive must have the same fine proportion in relationship to the whole as the delicate design on a woman's watch case has to the whole. However, variation of scale between two such products is so great that very few designers are capable of styling both successfully. Designers who have worked within the limitation of one scale often find difficulty in adapting themselves to work in other scales.

Photographs shown here illustrate that judgment of scale is based on familiar environment, and that the scale familiar to one person may prove completely strange to another. The scale of New York skyscrapers, for instance, seems truly astounding to the visitor from Europe who has never seen buildings comparable in size to these, the world's tallest. Likewise the designer who, scalewise, is most familiar with the small dimensions of watches and jewelry, is often unable to cope with the vast forms and space units required in design for city planning. He cannot successfully bridge such a variation in scale and consequently he is limited to designing and visualizing the smaller forms with which he is familiar. For the average designer, in fact, specialization in scale of design is often both imperative and desirable.

While the laws of design are constant, scale changes with the evolution of style. Currently, we are going through such an evolution. Many of our products are becoming smaller in scale because of the limitations of our crowded city life. The average American home is becoming more and more compact. Most of us have noticed that ceilings in our modern homes and office buildings are being lowered and that rooms are smaller. Ceiling heights for the small home have been standardized at approximately eight feet. Actually, small rooms look in far better scale when the ceiling is brought to seven feet. This trend will probably become even more pronounced.

Smaller rooms and smaller homes have led to a closer study of furniture and storage. This, in turn, has resulted in the present trend toward the storage wall and built-in furniture. Large, unwieldy, overstuffed divans and easy chairs rapidly are becoming things of the past. Table heights have dropped from 30 inches to 29 inches. Meantime, chair heights have steadily lowered, though I feel that the present convenient and comfortable height will be the fixed preference because rising from a chair much lower is too difficult.

In general, furniture in all rooms has become smaller in scale. A room which is small, but at the same time fine in scale and proportion and designed in excellent taste, can be as charming and livable as a larger room. Mere size increases neither the livability nor the comfort of a room.

Contrasted with *this* change in scale, consider the berths in the average Pullman car or the seats in our newest theatres. As a race, Americans are becoming taller. Consequently, the Pullman berths of today are six inches longer than those in which our grandfathers slept. Seating in all theatres, aircraft and public places is being designed and spaced to provide greater leg room. These trends automatically influence scale and style.

While scale determines the *proper* use of ornament, as well as the proportion of the ornamentation, one must always be guided by the function of a product in planning. For example, a dainty little wrist watch looks exquisite on the slender arm of a lovely woman. This same watch would, of course, be completely out of scale and would look quite ridiculous on the husky arm of a truck driver.

Likewise, on a larger scale, many buildings have been designed with so little heed paid to their environment as to make them appear equally ludicrous. From my office, fifty-five floors above Manhattan, I look out on architectural "masterpieces" with hundreds of tons of stone cornices pro-

Fairchild Aerial Surveys, Inc.

Designs can be completely misleading when one is in an unfamiliar scale environment. The photograph above is an aerial view of a river delta. It is six miles from one side of the picture to the other.

Dow Chemical Co.

The micro-photograph to the right, taken through an electron microscope, is .001 of an inch from border to border. It shows the metal structure of a highly polished aluminum alloyed surface.

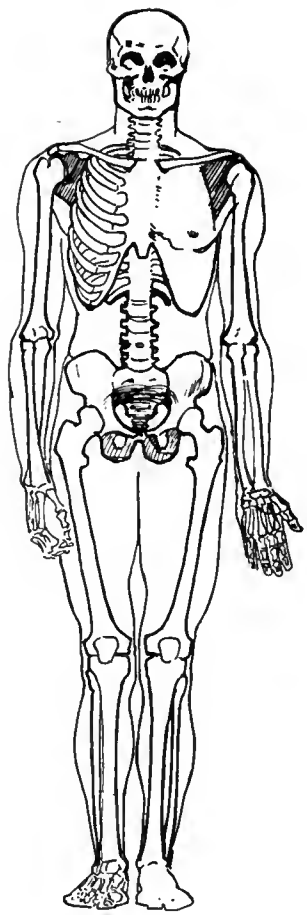
jecting perilously over Fifth Avenue. The building directly across the street from mine has an indisputably lovely facade. But, because it is so far above the street and above the eye-level of passers-by, I am sure that few but the city's pigeons can appreciate all this beauty. Stone for stone, the facade of this building duplicates a Palladian facade of the Renaissance. It is easy to visualize a board of directors, some 40 years ago, admiring a superbly rendered elevation of this building and deciding proudly to invest in archi-

tecture splendid enough to grace the New York skyline for centuries to come. But unfortunately, very few New Yorkers ever see this building in its true scale. In fact, they recognize the building only as a certain address. They see but the few feet of it included in the normal sight scope of the man in the street. It is physically impossible to get at the necessary distance from this building to appreciate it in the scale of the architect's original rendering and concept. The result of this and similar maladjustments has been an economic waste of many thousands of dollars in ornamental stonework impossible of appreciation by anyone beyond the architect who designed the building. This, of course, casts no reflections on our modern architects. Buildings like Rockefeller Center have been most admirably conceived in scale, with precious little money wasted in ornament that cannot be seen. These newer, finer skyscrapers in New York have been the result of financial limitations. Investors in real estate finally realized that the office buildings must pay for themselves. In the erection of new buildings, such a policy called for basic cost limitations, and these limitations were a challenge which architects met by producing better designs in scale, suitable to the environment and surroundings.

It is particularly important to realize that scale cannot be casually enlarged or reduced during development. The point can be illustrated this way: If we design a one-quart package for a can of oil and achieve proper layout and conception, we cannot take this design and simply enlarge it to produce the design for a one-gallon size, or reduce it to produce a one-pint can. The layout, legibility and all phases of the design are exactly suited to a one-quart can. Enlargement to a one-gallon size will throw the type out of scale in its relationship to the whole. Reduction to the one-pint size, obviously, would make some of the direction copy so small as to be difficult to read. Each size requires completely new layout.

A small table radio may look fine with a certain dial, bezel and grain of wood. However, the mere "blowing-up" of the design of this small model does not result in the correct scale for a larger radio. For one thing, it would be impossible to enlarge the wood grain proportionately. Moreover, the dial would need no enlargement because in the design of the small model, it had already been sized for readability. Thus we find that the mere enlargement of the same design from a small to a large radio cabinet is not the solution. In all things, scale is vitally important, and in designing a line of products, it must be critically considered in all phases from the tiniest single detail to the final concept as a perfect whole.

Architectonic and Plastic Design



Style, as noted earlier, runs in cycles — varying from simplicity to ornateness. These cycles also vary between plastic and architectonic form.

Tectonic design, deriving its name from the Greek word, TEKTON, meaning carpenter, is structural. It is built up by assembly — stick fastened to stick and stone laid upon stone. The tectonic design is basically a handicraft method of fabrication — the method man has traditionally used in forming his structures.

On the other hand, plastic design denotes an *integral* form or structure, a structure fashioned from a whole into a whole. Its Greek root is the word, PLASTIKOS, meaning "fit for molding." Ceramics illustrate the plastic form for they are usually created as an integral whole turned and shaped on the potter's wheel. They are plastic in structure and differ obviously from the assembling methods of the tectonic structure. Plastic design, therefore, is structure which is flowing and continuous in nature, usually monocoque in form. This plastic structure is more adaptable to modern mass production methods than the tectonic.

We are entering a new era of design — an era in which forms are characterized by the stressed-skin surface. There are two ways in which an object may be constructed so that it will form a self-contained unit such as is in common use daily in our lives. One of these is architectonic and it is basically like the human skeleton. Here a frame, connected at various joints, provides support around which the body or flesh is built to form a whole. *The support of the structure comes from within.* Thus architecture describes an assembly of skeleton frame members over which (to borrow from skyscraper language) a curtain wall is wrapped to protect the skeleton from the elements.

In contrast to this, we have the second method of construction, which is called plastic or monocoque. It is basically like the egg. *Here the support of the structure is on the outside,* provided by a thin stressed-skin surface.

The first builders and fabricators in the world joined wood and stone together architectonically. The Neanderthal man probably admired the egg both as a pretty remarkable object and because he liked its taste. But he couldn't make one, nor anything else which was designed on its principle.

The plastic mosquito bomber is a monocoque structure in mass production, and like all other monocoque structures it excels in efficiency in terms of strength-to-weight ratio. In other words, any structure designed so that the skin surface is stressed, rather than hung around some internal skeletal member, will be a more efficient and a stronger structure per unit weight.

The reason for this is very simple. If you take a solid steel rod one-quarter inch in diameter and three feet long, you can almost certainly bend it into a U-shape over your knee. Now visualize this same piece of steel expanded into a tube one inch in diameter. The rod has ceased to be a rod and has become a tubular skin-stressed surface. It is now so rigid that it is far more difficult for you to bend it at all.

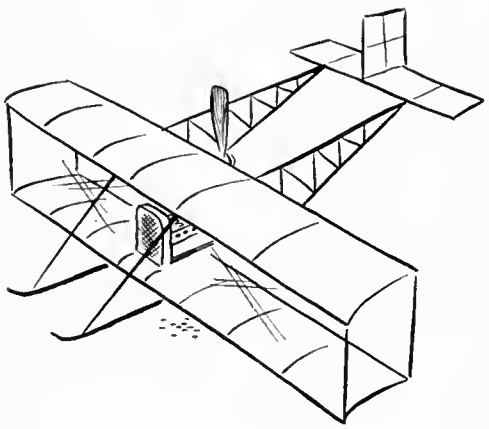
Nature applies the principle of the skin-stressed structure in many forms of plant life. A corn stalk has a horny outer surface which supports the structure while the pithy center merely holds the skin-stressed outer surface tubular.

The great efficiency of monocoque structure has been realized by engineers for many years, but only lately have mass production techniques been developed which will put it into general use. For example, the early automobiles were all architectonic in design. Today with the all-steel body, the turret top is welded rigidly to the other body members, making the body nearly monocoque in construction. The car will become more truly monocoque when the frame or chassis is eliminated and the *monocoque body becomes the structural member* between the front and rear axles. This type of structure has already been built in stainless steel railroad coaches, and passenger coaches so constructed weigh far less.

The reader who inquires into the basic nature of the true monocoque structure will find that it is born in a medium of equalized pressure. The egg would never be shaped as it is if it developed on a flat table. The egg, in fact, could more logically be expected to develop under water, just as the raindrop, another almost spherical shape, develops naturally when the entire surrounding medium is air. Thus it is that the true monocoque structure is possible only in objects completely suspended in a fluid medium. For this reason, the aircraft field naturally and functionally becomes a medium for the nearly perfect monocoque structure. I say "nearly perfect" because, after all, an airplane must land on the ground and so its retractable wheels prevent it from being truly monocoque in the strictest sense.

Whenever new industrial techniques are developed in one industry, they sooner or later start trends in other industries. Since monocoque design has been proved so efficient in the transportation industry, there is little doubt that sooner or later it will be applied to housing, furniture and other products. A plastic radio cabinet is an integral shell in one piece and in that sense is a monocoque structure.

Lockheed Aircraft Corporation



As the aircraft industry has progressed from one of handicraft assembly to relatively high mass production, it has left architectonic structure for monocoque form. This trend is true in nearly all other items of mass production.

In the past, the molding of plastics required such high pressures that it was never practical to mold large objects like chairs or tables. As a result, the design of furniture remained architectonic. But with the development of plywood structures, which will mold at low pressures, and new synthetic resins, which will cure at low temperatures, we now face the distinct probability that furniture design will change radically in the next decade and will turn to monocoque or plastic construction.

Indeed, most common objects which are mass produced can be improved in efficiency by changing their construction from architectonic to monocoque. *Monocoque construction is the basis of streamlining, and that is the functional reason why so many products in daily use are produced in that style today.**

*This has no bearing on the fact that *as a style* we are becoming tired of streamlined form. It is simply that monocoque structure usually is in compound curvature.

I do not mean that all our furniture, homes, or the things we live with should be monotonously plastic in form. Not at all; *there will always be architectonic form about us, because there will always be some structures whose very nature is such that they should be built architectonically.* Nonetheless, we should appreciate the fact that a tremendous change is under way in the wood fabricating industry. It is moving toward the newer stressed-skin type of structure so that new styles and new forms are bound to be developed. The next ten years will see a greater change in furniture design than the last hundred years have known. This will be based on the development of new techniques in molding the monocoque form in mass production. Public acceptance of these forms depends on the industrial designer, who must present them in good taste.

When it comes to designing chairs of monocoque construction, we are faced with new problems, since chairs do not fly through the air at several hundred miles an hour but are tied down to earth. The result of limitations imposed by the uses to which any given object is subject will result in designs which are not *truly* monocoque in construction. It is in the deviation from the basic monocoque theme that the designer will find opportunities to exercise his originality, show his taste and give objects specific consumer appeal.

The important concept to remember is that while man has been making objects for use during thousands and thousands of years, it is only within very recent decades that he has been able to construct monocoque forms from inherently architectonic materials. Since form follows function, we may therefore anticipate a greater change in design during this century than has ever occurred in the history of mankind. We are, indeed, entering upon a completely new era of design, the arrival of which is expedited by the new mass production techniques which give us plastic structures. The big changes will come in the materials which used to be handled in the architectonic manner and are now going to be handled in the monocoque manner, such as molded plywood and welded steel.

Finally, it should be pointed out that *the most interesting and lasting designs contain mixtures of tectonic and plastic form.* This is true in nature as well as the works of man. Of course, much in nature – an eggshell, a drop of water and celestial bodies—is purely plastic. Other things, such as cellular wood construction and crystalline structures of stone and metal, are purely tectonic. But, as far as man is concerned, he finds in most objects around him the happy combination of these *two* forms of structure. For example, man himself is supported by a skeleton that is tectonic—

Eero Saarinen and Charles O. Eames

Most objects are a mixture of plastic and tectonic structure. This is true in nature as well as the creations of man. This chair has a molded plywood back and seat, upholstered with foam rubber, and is plastic or integral in construction. The legs, however, are tectonic and provide accent and interest to the over-all design.

literally an assembly of sticks held together by flexible linkages. Around this tectonic structure are molded plastic forms and contours and, though the sculptured form of a nude torso is definitely more plastic in feeling than tectonic, it still expresses a combination of both structures which for natural beauty is unequaled.

Likewise, in the daily things we use, we appreciate the variety offered by a mixture of tectonic and plastic forms. When an object is entirely tectonic or entirely plastic, it becomes monotonous and uninteresting. A Chippendale chair is largely a tectonic structure which would be monotonous if it were not for its plastic ornamentation. Early Greek architecture was essentially tectonic, but, as the style progressed and the Ionic and Corinthian motifs were born, plastic ornamentation developed, culminating in the richer architecture which appeared during the Renaissance in Europe. This later developed into the Baroque, which revealed at its height the sensuous and feminine qualities of plastic ornamentation. Thus we see that, in architecture, a building is basically tectonic, but it can be softened, beautified and made more livable through ornamentation that is plastic in nature.

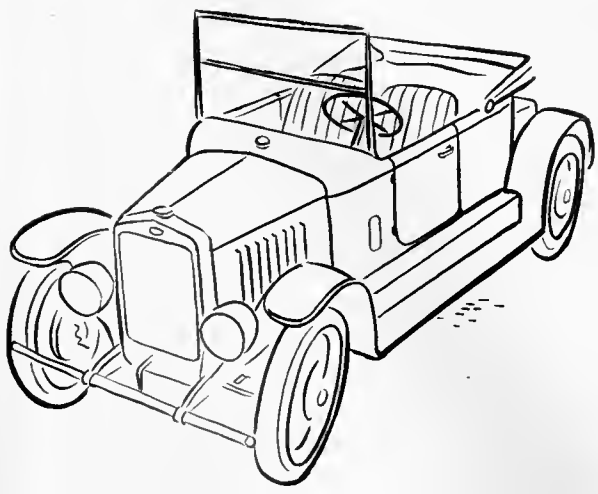
Certain phases of the construction industry will become more plastic —more integral in nature. For example, steel and aluminum window frames

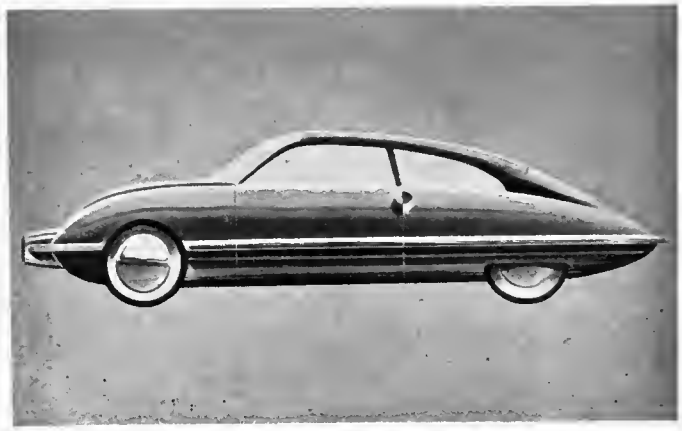
and sashes will be cast as complete units from one piece of steel. This will mean that window openings and lights need no longer be rectangular as is the economical structure for wood casings. Floorings need no longer be laid down stick by stick but may be integral, as is linoleum and plastic mastic flooring. Bathrooms and kitchens are tending toward integral design where all the units are mass produced at the factory and are shipped out to the site in one assembly. This is particularly desirable in eliminating joints and cracks which require cleaning and accumulate dirt in use. New adhesives are becoming as strong as the wood or other material they bind together. Thus, in the mass produced house, comes the prospect that the four walls and floor may be literally an integral structure. This will mean that we no longer need right angle intersections as we now know them. Add to this the flexibility of molded plywood and plywood veneers and you see that housing could become, if it seemed desirable, as completely plastic as the automobile.

The housing industry faces a tradition that was never experienced by the automobile industry. People have lived in tectonic houses for too many generations to switch suddenly to plastic forms like the igloo or the barrel-top huts used by our men during the war. Modern architecture, however, will use plastic form as a means of adding new variety and new interest to essentially tectonic structures.

The addition of architectonic forms to the automobile will result in a more interesting car, because a car is judged not by its elevation or contour but by its highlights. A more architectonic form casts sharp, clear highlights that give an automobile a greater apparent bumper-to-bumper length.

So it will be in our homes and in all the products of our daily living. A new style will be born. *To yesterday's indiscriminately applied streamlining will be added the variety of crisp, architectonic forms, a broader use of color and a finer application of decorative ornament.* Altogether this is a cheerful prospect, promising for our future products greater taste in design and improvement in function than any we have previously known.





Maturity Develops Specialization

The greatest value the professional industrial designer can give his client is an independent, unbiased and fresh point of view. His creative thinking should stimulate the client and his organization toward the production of something better. It is always difficult to think creatively and still produce practically. I have noticed that when industrial designers go on the payrolls of large industries, they often become dominated by the engineering department, spending far more time learning what cannot be done than what can be done. Any young designer in a large corporation quickly learns that it simply doesn't pay to produce sketches that are impractical. As a result, he soon thinks like his superiors and, when he does, he no longer truly creates. This is why many of our largest corporations retain outside industrial designers despite the fact that they have adequate and highly trained staffs of their own. Ideas are precious and they are not easily born. Most products are so complex that they cannot be the product of one mind, and *the ideal combination usually is established when a truly creative person is working with an open-minded but entirely practical person. As a team, they produce something fresh and distinctive which, at the same time, can be manufactured economically.*

The talented designer thrives on a variety of problems. No truly creative designer can style automobiles year in and year out and not go stale. It has been my own observation that a talented designer can give all his thought and time to a specific problem for only about three or four months at a time. After that he needs new fields to conquer and a change of scenery. No designer can pour his entire energy and creative thought into styling a refrigerator for 1947, for example, and then turn around the next year and produce a radically new and better one for 1948. The designers who work within industry, producing appliances and automobiles year after year rapidly lose the creativeness of a fresh approach.

I know this from personal experience because I have hired designers who have been on the staffs of large corporations, working on the same appliances year after year. It was surprising to see how rapidly they improved and blossomed when assigned to completely new problems. After six months of effort, their abilities as designers had more than doubled.

Designers should not be pampered as prima donnas because they are artists. On the other hand, designers employed by industry cannot be assigned year in and year out to styling dashboards under the strict and close scrutiny of the engineering department without losing most of their creativeness and their sense of style.

Another very interesting comparison between industrial design and other phases of production is that *creative ideas are not necessarily born of numbers.* For example, an acre of draftsmen — a common sight in our large aircraft and automotive plants — can turn out so many square miles of blueprints a month. But the setting up of an industrial design department and the hiring of 50 designers does not necessarily assure a truly distinctive and successful product. *One truly talented industrial designer is worth more than ten average designers. A large number of mediocre ideas does not necessarily produce one good idea and an industrial designer who has the talent to produce that one good idea is rare.*

I often hear industrial designers say that since they are competent artists, and since the basic laws of art apply to all industrial design problems, it follows that they should be able to solve any problem in any branch of industrial design. This is like saying that, since mathematics, physics and chemistry are the basis of our engineering professions, anyone with an adequate knowledge of these sciences should be able to apply himself to any specialized task in the field of engineering development. We all know, however, that the sum of knowledge in engineering has become so staggeringly great that specialists are now pinpointing their efforts in very narrow channels. The engineer has never been expected to know very much about marketing and consumer tastes and preferences. The industrial designer, on the other hand, must not only have mastered the fundamentals of art and their application to industry but he must also be an expert in marketing and consumer tastes, *and these vary widely with different applications and in different parts of the country.*

Industrial design is, therefore, tremendously broad in its scope of products and its application. It is also broad in the understanding and interpretation it requires in solving any specific problem. It includes all consumer articles, except clothing and soft goods. Nearly every page in the Sears Roebuck catalogue presents products that have been carefully studied by the industrial designer.

The products of capital industry are also styled — such things as machine tools, turbines and heavy industrial equipment. Here the object

Industrial design is a truly versatile profession covering everything from lipsticks to locomotives. This broad scope of effort requires more than an appreciation of the fundamentals of applied art. A knowledge of the merchandising methods and production limitations in each field of application is essential. These requirements are so broad that specialization is now taking place in the profession.

is to make the machine tool look husky and efficient rather than merely pretty. Actually, tests in the field show that a worker will take better care of and show greater pride in his machine if it looks smartly designed.

Industrial design is an important factor in the field of architecture where merchandising is concerned. This aspect is discussed in a later chapter. Such design touches all phases of transportation and communications — railroads, aircraft, steamships.

A designer who could style the exterior and interior of a transport plane requires not only a well-developed background in the basics of art and engineering but also a knowledge of *air transport merchandising*. His task includes the selection of fabrics, design of seating, lighting and all equipment, stewardesses' uniforms, loading ramps, and so on — the list is surprisingly long. A person who is talented enough to perform this job

Designing for the transportation industry requires years of practical experience. Scale is large, function highly important, development costs unusually high, and obsolescence becoming increasingly rapid. Good design here can result only through the closest cooperation between management and the industrial designer.

adequately certainly could not be expected to design a line of ladies' wrist watches nor to package a line of pharmaceutical products. *The field of industrial design is so broad that specialization is absolutely essential. Even as we have mechanical engineers who would not attempt to solve a problem in electronics, and electrical engineers who could not possibly develop a new synthetic resin, in the broad areas of industrial design there are highly skilled specialists who work primarily in their own fields.*

Twenty years ago when art was first applied to mass production, there was no such skill and no such specialization. The early industrial designer was willing to tackle anything and everything and, as a result, he failed more often than not. He either produced designs that were impractical for mass production and could not be made, or he produced designs that, while pleasing to himself esthetically, were not acceptable to the mass consumer and, therefore, did not show profitable sales. As a result, many manufacturers came to believe that the industrial designer was an impractical visionary who had to be watched closely lest he dream up beautifully air-brushed intangibles that could never be used without complete re-working by an engineering department.

For this reason, as the profession has matured, top professional organizations have departmentalized, breaking down their personnel into transportation design, product development, packaging and interior design. This specialization does not mean that designers in one department are not capable of making genuine contributions to another. On the contrary, their fresh point of view is welcomed. However, to see a problem through to a successful conclusion, the knowledge of experts is required. The cost of most new products, including engineering, tooling, advertising and marketing is so tremendous that no manufacturer can afford to be wrong. He certainly cannot afford to leave the heart of his business — namely, his product — in the hands of an inexperienced artist who has decided to free-lance as an industrial designer. *There is no individual industrial designer, regardless of his talents, who is capable of solving adequately every product problem for American business.*

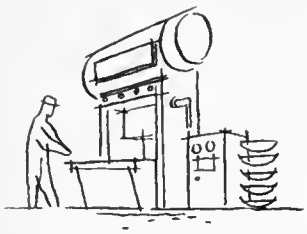
The wise executive buys industrial design largely because he realizes that his organization, no matter how carefully managed, is bound to become in-grown and self-centered in its thinking. Fresh, creative ideas are precious and essential to continued growth, because we are in a period of unprecedented change. *An organization is as fresh and creative in its thinking as the inspiration it gets from the top.*

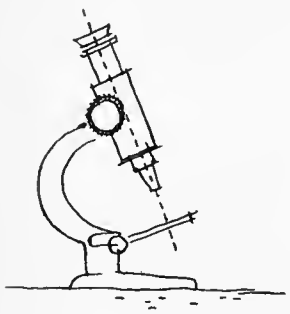
Industrial Design and Merchandising

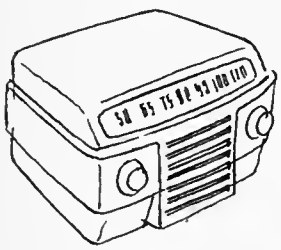
Merchandising is the means by which a product is moved to the consumer. Since the primary aim of the industrial designer is to aid that movement, he must be aware of modern methods in merchandising and how art applied to merchandising can stimulate consumer acceptance. How a product or service is to be merchandised influences designing right from the start. For example, very few manufacturers sell only one product. The costs of mass distribution are so great that most manufacturers prefer to sell a line. In electric irons one might have a "leader" priced at $2.49 and then offer three other electric irons with prices spaced at appropriate intervals all the way up to a new and super deluxe steam iron selling for $19.50. The purpose of this broad spread in price range and quality is to *stimulate the merchandising principle of "trading-up".* This principle has been proven successful in many diverse fields. Success in merchandising such a program depends to a large extent on the skill of the industrial designer in making all products attractive and providing each with a sales appeal factor justifying its position in the price range.

The "leader" is advertised and serves the purpose of bringing a prospective customer into the store. Neither the manufacturer nor the dealer makes much profit on the "leader". It is simply a means of writing off overhead and of building business. However, a certain percentage of the customers who come in a store planning to buy the "leader" end by "trading-up" and purchasing a higher priced product. The primary means of stimulating the impulse to "trade-up" is through design — the stimulation of eye appeal, combined with improved functional features. This principle has been used with unusual success in the refrigerator industry.

A well-planned line requires ingenuity because many duplicate parts must be used on all models to save initial tooling and engineering investment and to simplify inventories and manufacturing operations. Thus, from a style standpoint, the stimulation to "trade-up" is largely one of sheer skill in the application of visual ornamentation. With this must be combined the keen merchandising of various features.







In refrigerators, for example, automatic defrosting is an extra. Glass shelves are an extra. Ice trays that pop the ice cubes out automatically are extras, and so the list goes. It takes smart planning to evaluate properly the order in which these extras should be used to stimulate "trading-up" to the greatest possible extent. Only careful market analysis and keen observance of buying trends can guide an intelligent solution.

Pricing is also very important in planning a line of merchandise, for "trading-up" is based entirely on the principle that the buyer comes into the store prepared to pay one price for a model and is influenced by the eye and convenience appeal of "extras" to buy a higher priced model. Let us say, a woman comes to buy a 6 cubic foot refrigerator which is being advertised at $120.50. She finds, however, that this is a "leader" and does not have automatic defrosting. She remembers that it was a nuisance to defrost her old refrigerator, so she looks at other models. She finds the next higher-priced refrigerator at $139.50. Although it too is 6 cubic feet in size, it offers the added convenience of automatic defrosting and has far more eye-appeal. There is an attractive and smartly illuminated panel above the evaporator door. The shiny nameplate is as attractively designed as a costly compact. Improved space is provided for the storage of vegetables — and so the list goes. The woman buyer is more and more attracted to this model, realizing that all these extras are going to cost only $19.00 over the price of the "leader" model. The alert sales clerk acquaints her with the fact that the 6 cubic foot size probably is not large enough for her family. The recent trend has been toward larger and larger refrigerators per family, and so the prospective buyer is soon convinced that an 8 cubic foot refrigerator with added space for frozen foods is the very minimum that can meet her requirements. The result is that she winds up willing to pay $178.00 for her refrigerator. Glamour, improved function and good salesmanship have finally closed the deal; and both the dealer and manufacturer have moved a greater dollar volume of merchandise than would have otherwise been possible had they advertised the $178.00 refrigerator in the first place.

The industrial designer, through his knowledge of style and tooling, can build a wider and better-balanced line within a given capital investment, thus providing a greater opportunity to exploit successfully this merchandising principle.

To provide greater outlets for their products, many manufacturers make products under different brand names. Our large catalog houses and department stores merchandise many appliances under their own brand

names that are manufactured for them by nationally-known companies. These products must have as many interchangeable parts as possible. In other words, if a manufacturer of electric fans is planning on selling a line of fans through Sears-Roebuck and another line of fans through R. H. Macy and a third line to his own dealers, he would naturally much prefer to sell all three outlets substantially the same fan with only enough visual modification to prevent association in the mind of the ultimate consumer.

This trend undoubtedly will continue to increase because more and more *large merchandising organizations* are being set up to move the products of American industry to the consumer. It will mean more and more new brand names. Here, the problem assigned to the industrial designer is to make several completely distinctive lines of products from substantially the same tooling. Through minor modifications in external appearances, changes in name plates and color, and with relatively small investments in

"Cheesecake" is one of the foundation stones of publicity photographs, but it is hard to see how it can help merchandise something as purely functional as a dynamo. Fine design, however, can add sales appeal to industrial equipment. Its aim should be to make a product look more rugged, efficient, simple to operate and maintain.

new tooling he can establish a completely new line, thereby opening up new markets. The increased volume that may be built up this way considerably affects the unit cost of production. Obviously, one of the most vital factors of success in this type of merchandising rests squarely on the shoulders of the industrial designer and the ingenuity of his work.

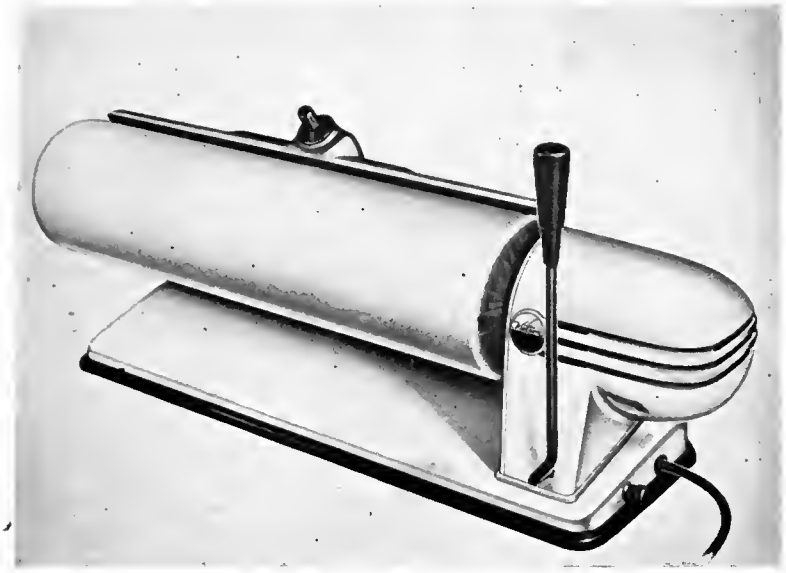
Further factors of merchandising that limit design are such considerations as shipping weight, freight car clearances, carton and crating costs. For example, if a designer puts fixed legs and a fixed dashboard and lighting fixture on an electric range, he will discover that the increased dimensions of the shipping crate are such that there will be a great reduction in the number of ranges possible to load in one standard freight car. He may then have to modify his design so the legs are removable and easily mounted by the dealer in the field.

Methods of distribution also play an important part in design. There are three basic means of moving merchandise — through *stores,* by *mail order* catalogs, and by *door-to-door selling. The industrial designer should follow his product to the ultimate point of sale in each of these methods of distribution.* He should be concerned with showroom design and presentation in order to stimulate dealer and distributor enthusiasm. He should design point-of-sale displays and store interiors. He should talk with buyers and sales clerks. One of his prime responsibilities is to find out *why* a given product is selling, and there is no substitute for trips into the field to gain this knowledge.

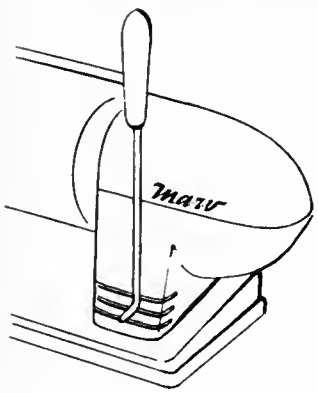
Products that are sold through mail order catalogs rely primarily on price and eye-appeal, because in a catalog the product may be shown visually in full colors and may be accurately priced, but quality and much of the function are, of necessity, described verbally. For these reasons, the styling of a product and its presentation in the catalog's format becomes a particularly important means of moving the merchandise.

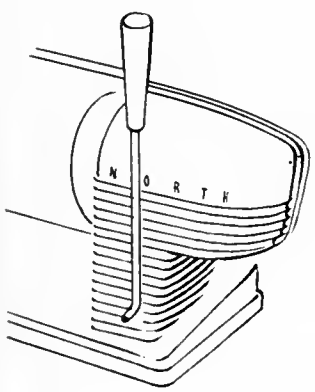
Door-to-door canvassing undoubtedly will increase in coming years when competition for the consumer dollar grows. We may anticipate seeing all household appliances sold from efficient and glamourous miniature stores mounted on large motor trailers towed right up to your front door by your smiling dealer. The prime law of good merchandising is to *show the merchandise.* What better way to sell a woman an electric toaster or a new washing machine than to take a model kitchen directly to her front door and demonstrate the equipment? Fuller brushes and the Electrolux vacuum cleaner show that substantial businesses may be built on this principle of

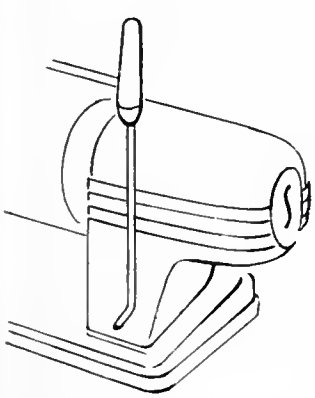
J. Gordon Lippincott, designer. Victor Electric Products, Inc.



Style can build a larger line from substantially the same tooling and engineering investment by changing the housings and nameplate by which the consumer normally identifies a product. This enables a manufacturer to merchandise substantially the same product through several outlets, using different trade names and pricing.







merchandising. The products, of course, must speak for themselves in competition with merchandise that can be bought in a store or through a catalog. Here we should remember also that the consumer judges the product and the manufacturer by the appearance of the salesman. His dress and manner, the catalog and kit he carries—all these things must be critically studied in the light of good merchandising.

Another essential phase of merchandising is the *stimulation of the desire for ownership on the part of the consumer.* This is initially done through advertising, and here the industrial designer and the advertising agency have exactly the same objective for their mutual client — i.e., increased sales and profit. The industrial designer supplies the advertising expert with much of the ammunition for his story. Such factors as eye-appeal, improved function and product personality are strong points of consumer interest. Pick up any newspaper or consumer magazine at random and make a check of the advertisements you find. Over half of them will

feature appearance, eye-appeal, glamour and other factors appealing to the emotions, whether the product is a refrigerator or a toilet soap. Close cooperation between the advertising agency, the industrial designer and the client can result in a product of far greater consumer appeal. It will also mean closer integration between the product itself and all booklets, catalogs, point of sale displays, store interiors and other factors that stimulate sales.

The industrial designer may also help his client in public relations. There is at present in the United States such a tremendous consumer expectancy toward new and better things that an outstanding product or a new and improved service *is actually news and may accrue to the benefit of the manufacturer through the editorial pages of our magazines and newspapers.* Women's magazines particularly are always looking for stories with human interest and with new appeal.

The Libby-Owens-Ford "Kitchen of Tomorrow", for example, captured so much public interest that it appeared in nearly every important consumer magazine, all press services, and on twenty radio programs. Department stores even paid for its exhibition, and nearly two million people saw the kitchen and listened to a twenty-minute lecture on its function.

While most products cannot hope for this degree of publicity (because most products have to be more nearly down-to-earth for immediate sales) the public reception of all new products should be planned carefully. *Here, the industrial designer, because he lends personality to the product, can be of outstanding assistance in hitting editorial pages.*

Thus we see the industrial designer should watch every step of product development from the concept of the idea down to the ultimate sale. Art applied to merchandising can yield as spectacular results as art applied to the product itself, and here we still have a long way to go.

Procedure in Product Design

There are five basic steps in the sound development of a product or service and this is true whether you are a manufacturer of chewing gum or operate an airline. A careful study during each stage is important to the final success of the product – and any short-cuts are dangerous since they run the risk of lowered consumer-acceptance.

Orientation

The first phase is orientation – a period during which a careful survey is made of competition. If you are bringing out a new product you will want to know the sales potential and competitive experience. If you want continued growth for your old products, a study of competition will enable you to see your product as the consumer sees it – on a basis of comparison.

A survey should also be made of production, materials, methods, equipment and costs. Such basic questions as –"What shall we make – how shall we distribute it – how can we improve our product – how can we cut costs – how can we increase our dollar sales?"– these are all questions of orientation. They are questions of making fundamental decisions as to direction of procedure. No product development program can be a success unless objectives are well defined and guidance is whole-hearted and adequate. Also, an important part of orientation is the research of consumer needs.

Creation

Once the basic delineation of objectives has been defined, sound creative thinking is well under way. In product development and styling the first phase is the making of idea sketches – and many of them. It is important to realize that the right idea is only one in a hundred, and the creative designer and engineer is a man who is willing to "stick his neck out." During the creative stages the man who says "it can't be made" is not going to go as far as the man who seeks something truly new, different and fresh and is willing to ask "why". *It is always easier to reach for the stars and then come down to earth with something fresh and new than it is to raise the sights of someone who is eternally practical but, of necessity, dogmatic and limited in vision. The early stages of creative styling and engineering, once the objectives have been determined, should be a period of complete freedom in creative thinking.*

The second phase is round-table conferences between designers, engineers, sales executives, production experts and top company executives. The purpose of these meetings is to separate the wheat from the chaff. Most of

the creative sketches are impractical, too radical or too far advanced for current consumer tastes. *Conferences are a means of selection.*

Conferences nearly always mean a *compromise.* Very few products made by mass production are entirely the creation of any one man. When a group of talented designers, engineers and executives put their minds to a specific product, there are bound to be differences of opinion and, as a result, the final design is always a compromise. There will be compromise in style, function, materials and costs. Therefore the attitude of all those concerned with the creation of a new product should be in the spirit of give-and-take — since no one has a corner on all the brains or ingenuity.

One of the best methods of choosing a final design from a wide series of idea sketches is to map them in profusion on the wall and live with them for a few days. Livability in design is far more important than snap-judgment. You will find that a good design "grows on you" while a poor one tires. It is of greatest importance that the industrial designer be able to express visually creative ideas for new products so clearly that they may be appreciated and understood by all concerned in an organization.

As the creative stage of product development grows, the first aim should be toward a visual full-scale model. This need not be made in the final materials of mass production but it should resemble as nearly as possible the exact article that will be seen by the consumer. Aircraft manufacturers, for example, make full-scale "mock-ups" of aircraft interiors in order to plan adequate seating arrangements and to visualize color and texture schemes. Whether your problem is one of a new package, an electric razor, a lawn mower or a tractor — there is no substitute for a full-scale model showing the product as it will appear in its ultimate form.

Such a model is not only a tremendous aid to the sales department — it also serves as guidance in the better visualization of engineering assembly, tools and dies.

It is seldom that a full-scale visual model is made without further changes since most products in the round take on new characteristics that were not apparent in the initial renderings. Further analysis usually develops a second full-scale model which becomes the basis of the final design.

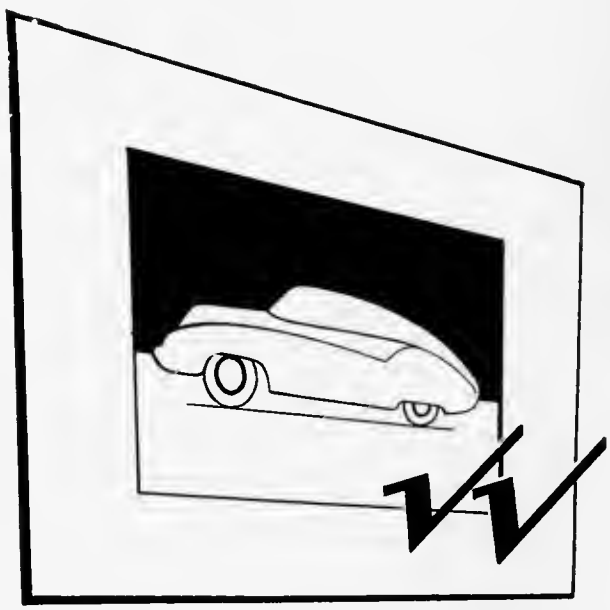
In most product development, the next step is preliminary engineering, resulting in a full-scale *operating model.* For example, if we were developing a new washing machine, the engineering department would make preliminary details sufficient to construct an operating model on the proposed principles of design — a model not only resembling the visual model in appearance but also capable of washing clothes.

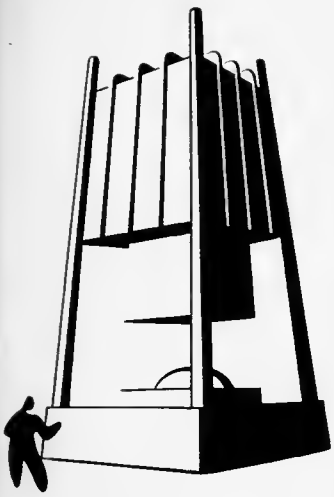
Confirmation

Once a new design has been developed, styled and engineered so that we are sure we have a new product and a better product — we proceed with *confirmation of our development.* The costs of final tooling, production, advertising and distribution are far too great to bring out a new product without first making sure we are right. The first step is a careful cost analysis to see that the product is competitive and will make money at a forecast retail price. The production models are then tested for function and use. They are given breakdown tests to see if it is possible to discover "bugs" and errors in design, in order to cut down costly failures in the field. A new model for an electric refrigerator, for example, is carefully tested for a full year before it sees the light of mass production.

Surveys should be made of market acceptance for the new design. If a company were considering a packaging change of major importance, they might spot-test consumer acceptance in key cities and, on the basis of sales results, judge the success of the new package. Such surveying of acceptance of new styles has not yet been done to any extent. At present, a survey usually consists of showing the proposed new design to dealers and buyers only, and it is at best merely good guesswork. The only valid survey of market acceptance is made by taking a proposed design to the consumer himself, and this should be done wherever possible.

The above steps usually result in minor final revisions — after which final engineering, detailing, and specifications are made.



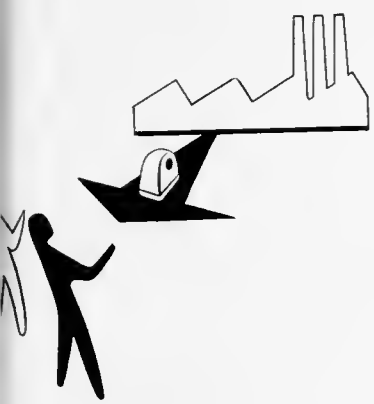


Production

Tooling and purchasing are immediately started, based on the approved and final design. Plant layout is often modified for new assembly lines and production procedure established. This is usually beyond the responsibility of the industrial designer except where changes or modifications in design become apparent because of production difficulties. However, the designer usually does see his product in production and thus is able to appreciate tooling and other limiting factors of design, so that later designs may be better coordinated with plant facilities.

Distribution

During the final engineering stages of most product development, the sales organization is doing initial groundwork. The advertising agency and public relations counsel are building up initial consumer interest and demand. Dealers and distributors are primed and receptive.



The actual methods of distribution are beyond the scope of the industrial designer although he must be aware of their importance and, in particular, he must be sensitive to the desires of the dealer who is to display and sell the product. Trips into the field with the sales staff to observe product sales actually on the buying line are an extremely important experience for any designer. *It is his primary means of developing that sixth sense — consumer trend in style preference.*

In any alert organization these five phases in product development are going on *continuously*. Research is never-ending and product improvement never stops. A product that is truly and distinctly better than that offered by competition is not easily born nor can it hold that enviable position without continued effort. Therefore, every company, regardless of the product or service, should set up research and development men within their organization and should retain outsiders as consultants on any of the above phases that seem necessary, in order to develop and grow continually throughout the years. *The costs of sound planning and research are relatively small. The spark, guidance and stimulation for these procedures must come from the top and, if continuously and wisely executed, they will pay magnificent dividends.*

Importance of Model Making in Industrial Design

Before any design goes into mass production, a full-scale model should be made and, if at all feasible, an operating model. The costs of tooling, merchandising and advertising are so great that any economies gained by skipping the model-making step are more than offset by the greater risk of producing an article that lacks consumer acceptance through failures in styling or function. Renderings are particularly misleading and should serve only the function of stimulating new, fresh, creative thinking. In other words, renderings are only the expressions of the idea stage. As soon as a proposed form for a new product has been selected, models should be produced — in full scale whenever possible or practical. Half and quarter-scale models are completely misleading because most people do not have the ability to appreciate or visualize changes in scale. A molding on a quarter-scale model of a refrigerator may look perfectly satisfactory, but when the same design is enlarged to full scale, the molding will be completely out of proportion — usually too large.

Since scale models are made for the judgment of executives as well as the designer himself, it should be pointed out that executives *especially* do not appreciate how a scale model will look when it is enlarged to full size. Except for *preliminary* planning in objects as large as automobiles and locomotives, scale models should be scrupulously avoided. Scale models of interiors are very misleading. There is no way to enlarge in scale such things as textures, which are a vitally important part of any interior design. Moreover, scale models of interiors are seldom viewed from eye level and usually seem very cramped and small as compared with the finished design. Scale models do help, however, just as a rendering helps, in planning space and construction methods. But they cannot be relied upon to express adequately the character of the finished product.

Another point in model making which should be watched is that the texture and finish must be the same as in the final, completed object. A clay model, for example, of a full-scale electric toaster will look nothing like the completed chrome-plated and plastic-finished article. Clay has a different index of reflectivity, and one sees an electric toaster by its reflection. Clay as a plastic medium is exellent for model studies, but its use alone for the final model of an appliance designed for mass production is false economy. Such appliances should be presented in the *final* materials, of mass production exactly as they will look and feel to the consumer.

In designing a streamlined surface, it should be remembered that plastic forms are seen by highlights rather than by elevation or contour. Thus, forms in compound curvature cannot be adequately visualized except in perspective renderings or in the round. Designers in the past, since they usually worked with tectonic form, could visualize accurately the appearance of a structure in elevation, section, and orthographic projection. This is because tectonic form, being crisp and prismatic in structure, is seen by its corners and edges; that is, by its outline or elevation. Plastic form is more elusive and can be truly appreciated only in a full-scale model.

Duo Coach Co.

Air brush renderings and scale models can be misleading. Only a full scale working model can assure a manufacturer that design and engineering are right. The trailer above was modeled in a matter of several months, and made accurate pricing and testing possible.

J. Gordon Lippincott, designer. Courtesy of Simmons & Co.

Product development takes place during modelmaking. The first photograph to the right shows a clay model of a proposed design for the Simmons Electric Blanket control. The operating model finally selected is shown below and was picked because of the merchandising opportunities in the thermometer-type dial.

In styling any plastic form, surface decoration becomes particularly important. Such decoration may be achieved in two ways: either by variation in the form itself – in which case highlights and shadows will be picked up – or through a change of material or texture which will provide variation in color and interest.

In automobiles, this change of material has been accomplished through the application of chrome-plated radiator grille, bumpers and trim. These chrome parts add the sparkle and interest of highlights, and they accentuate form. Strip the modern automobile of its chrome and you will find it deadly uninteresting. This is because plastic form itself is uninteresting and needs relief in ornamentation.

Only the use of models, however, shows *where* the need for contrast is required and *how* it can best be obtained. Good model-making costs money. A full-size operating model of a new lawn mower may cost two or three thousand dollars, but it will demonstrate the soundness of a design requiring twenty thousand dollars in new tools.

In developing many products, it is desirable for the designer to work in the model shop itself. For example, in the development of models for a new fountain pen, the question of how the pen "feels" in the hand cannot be judged from a rendering. How the clip will look in a pocket; how it will display in its package – appreciation of all such things requires that the designer work directly in the model shop with the model maker. There is no better way to appreciate *material* than to work directly with the medium in one's own hands. For this reason, a fully equipped model shop should be at the disposal of every progressive industrial designer.

J. Gordon Lippincott, designer. L. E. Waterman Co.

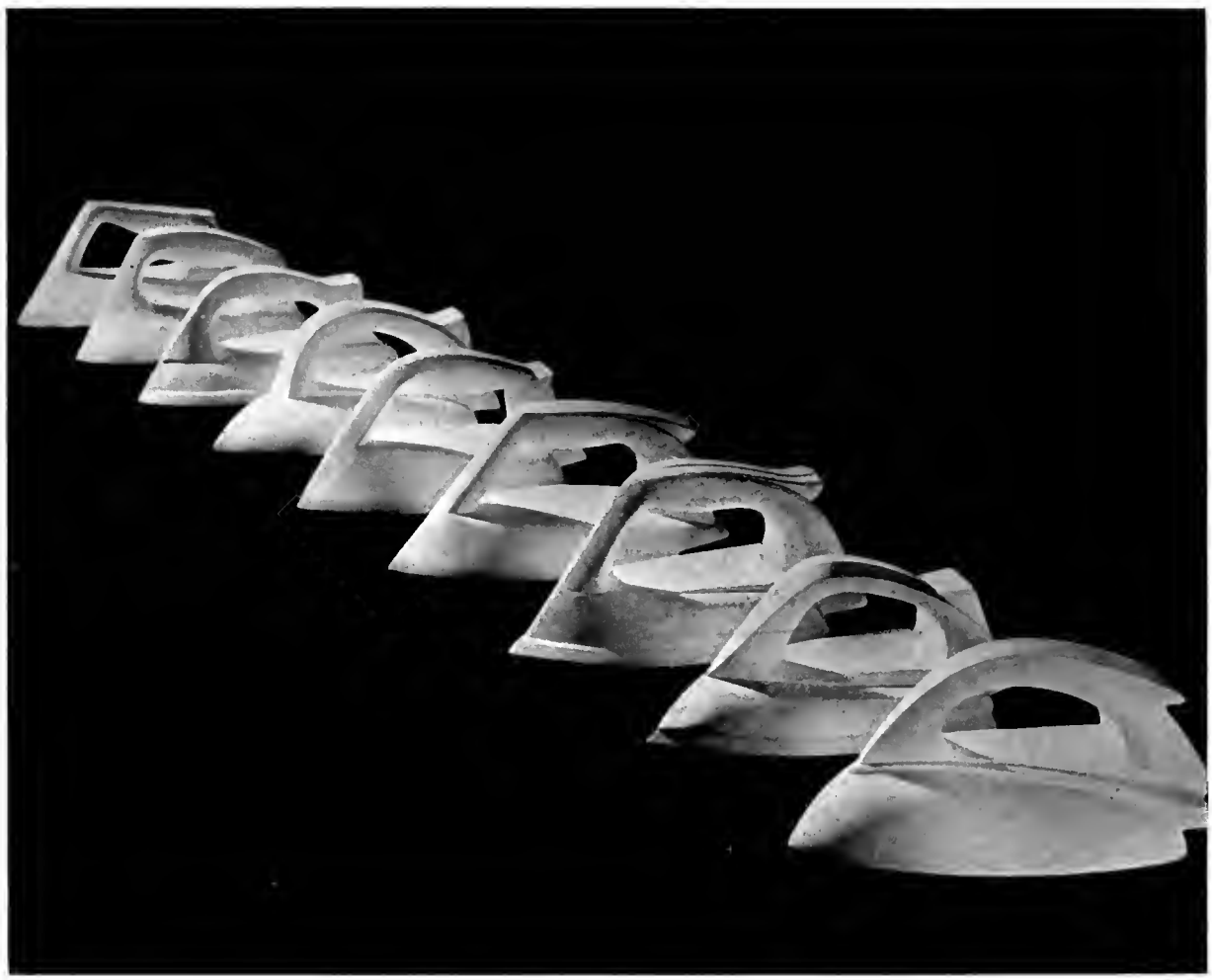
This model of a writing set shows the appearance and assembly of a molded plastic top and die cast base. It is an essential step before final engineering drawings and specifications.

Pratt Institute

An automobile is seen by its highlights, and this is true of nearly all plastic forms. Renderings can at best merely guess the location of highlights—only a full scale model can show the subtleties of a fine design.

In problems where feel and balance are as important as appearance, many models are often made to aid the process of selection. These models are in plaster, and the final models will be made in the actual materials of mass production.

Pratt Institute



Even as functional a product as an automatic stoker can be improved through a careful study of style and operation. This wood model demonstrated the value of a proposed design that had fewer parts and was easier to clean.

J. Gordon Lippincott, designer. National Institute of Diaper Services

A better diaper disposal can is a means of building new customers for laundries. Field testing a proposed design can only be accomplished through the use of full scale models.

J. Gordon Lippincott, designer. General Instrument Corporation

Models serve not only product development but sales as well. When a model is beautifully made, it can be photographed and used to prepare sales literature, so that a campaign may be planned while tooling is taking place.

Products Mean Prosperity

It is always a moot point when a gadget or a luxury becomes a necessity. Forty years ago the automobile was a gadget. Twenty years ago, it was a luxury. Today, in our present mode of living, the automobile is most certainly a necessity. This illustrates the basic axiom that, *once a product or service attains wide mass acceptance, it becomes integrated with our method of living and so becomes a necessity.* America has measured her prosperity and her growth on these standards of material production.

Rightly or wrongly, we have considered these products of industry as an index of our national wealth and prosperity. We have been mightily advanced in some things and incredibly backwards in others. We have developed ingenious little things to add to the comfort of daily living, such as electric blankets, curling irons, combination bed lamps and radios, orange squeezers, waffle irons and many others, but we have not solved the problem of low cost housing, truly functional clothes for men, or mass-produced foods that will keep our nation in tip-top health. In other words, *we have done an outstanding job in the secondary necessities while to a surprisingly large extent neglecting the primary necessities of food, clothing and shelter.*

New products mean new industries. The mass acceptance of air transport will change our cities and our way of living.

J. Gordon Lippincott, designer. Allbright Electric Corporation

J. Gordon Lippincott, designer. Maguire Industries, Inc.

Flashlights, radios or sterling silver—all contribute to the American way of life and create jobs for the American consumer. The continual search by industry for new and better products is one of our great national assets.

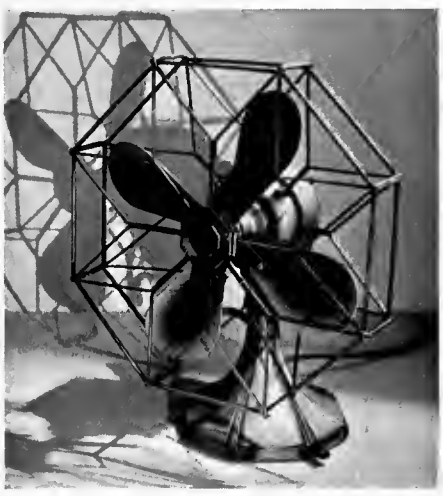
Pratt Institute

There is a tremendous market for American industry in supplying real human needs. This country does not require another electric toaster when there are already over 30 companies manufacturing electric toasters today. It does not require more, or even appreciably better, radios from the standpoint of having wide product selection because there are well over 100 manufacturers of home radios in this country today. The tremendous market facing the American manufacturer is not in gadgets or semi-necessities but in *actual necessities.* Housing is a number one national problem that certainly can be licked by a nation that put anything as complex as the B-29 plane into mass production. Our transportation industry is an absolute necessity. It is badly congested because it has grown so fast, and because it is based on transport between cities that are themselves obsolete.

Every manufacturer who contemplates bringing out a new product or a revision of his old product should ask himself critically whether he is *really* contributing to the betterment of American living — whether it is really a necessity. This is not altruism nor even social conscientiousness on the part of American business men. *It is simply that products and services based on genuine human needs survive longer than products based on fancy, fad, or appeal to luxury.* In other words, with the tremendous uncertainty as to what the years ahead may bring, businesses with their investment made in necessities are less subject to economic cycles or the vagaries of human nature than enterprises based on gadgets.

The true index of a country's prosperity is based on down to earth fundamentals — better homes, better schools, better health, more leisure and security. This is not to say that we, as a nation, should not have luxury and quite a few gadgets thrown in. We *can* have them. Indeed, with our present productive capacity one might even say we *must* have them in order to achieve full employment and national prosperity. In the next ten years, many a former luxury will become a necessity — automatic clothes driers, dishwashers, a telephone in one's automobile, radiant heating and many others. It would be unfortunate, however, if we were to continue to add to our luxuries without solving the basic problems of our primary necessities. This is truly a major problem in consumer and industrial research.

Product development moves slowly! The evolution of the electric fan represents a span of development covering nearly forty years and proves that no manufacturer should expect perfection overnight, simple as these steps may seem in retrospect. There were many costly hours of engineering research behind this march of progress, and only continued research can assure continued growth.



Advances in the technology of air transport have been paralleled by advances in styling and interior design. When we realize that this early transport interior was photographed only decades ago, one appreciates the breathtaking strides made by the aviation industry.

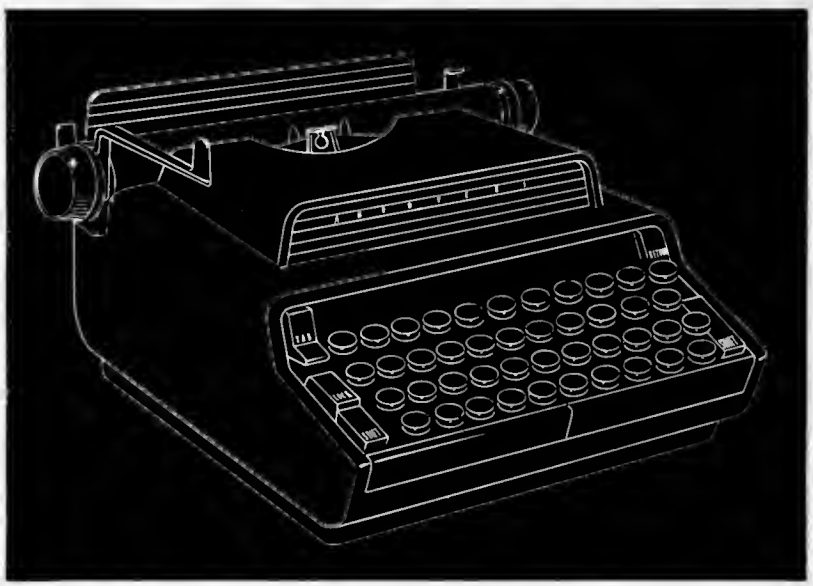
Personal aircraft may well be big business in a few years to come. We already travel more than any other people on the face of the globe, and the airplane may profoundly affect our world relations, since it will broaden our interests beyond our borders, even as the automobile caused travel to be commonplace beyond our individual communities.

J. Gordon Lippincott, designer. Republic Aviation Corporation

Electric appliances are typically American. In no other country in the world are they used so widely by all levels of population. Their growth is based on wide electrification and a tremendous mass market. The fact that there is no longer cheap labor or domestic help available in this country means that electric appliances and labor saving devices will continue to find wide acceptance and growth. Unfortunately, our homes have not been designed for these appliances. There is not enough efficiently planned space for their use or storage and there are far too many varying and unrelated appliances. *Simplification is now the primary requirement. We should study electrical appliances as they are used in the home—not as given isolated units.* The modern home designer will plan space for the use and storage of all appliances, with as many of them being built-in as possible. *It is an axiom in product development that anyone can make something complicated — but it takes true genius to make something simple.*

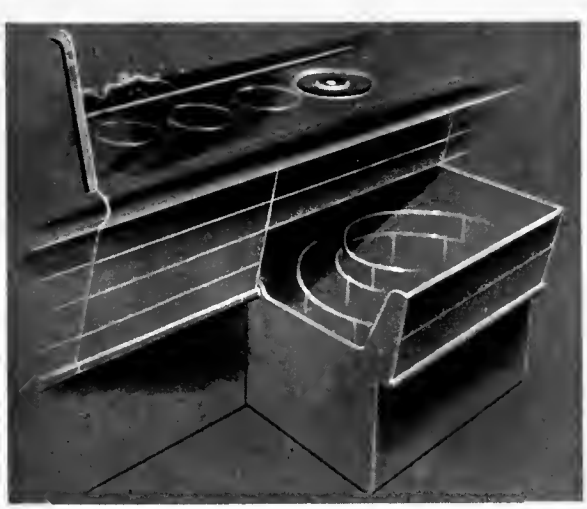
Our complex living has given rise to the growth of ingenious machines for the recording and expediting of business. With the application of electronics the business machine industry is taking new and ever-greater strides forward. Perhaps the simplest of these devices is the typewriter. The progress from early handmade models to today's machines will not stop — it can be anticipated that typewriters fifty years from now will continue the progress so evident above.

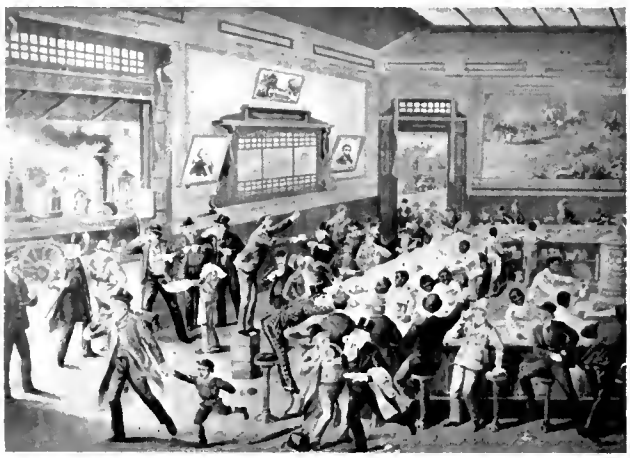
One thing that is apparent as product development continues is the greater expenditure of money in research and tooling, requiring the closer cooperation of ever larger groups of men. Gone are the days where products as highly complex as the business machine can be born in an inventor's attic. Product development today means costly laboratories and highly skilled technicians seeking year after year for gradual product improvement.

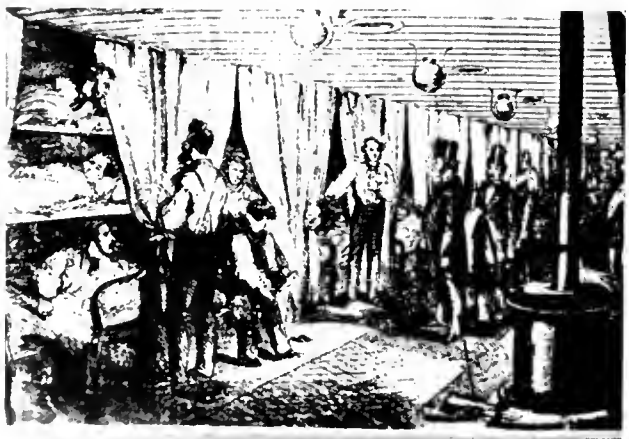


In the eyes of the world perhaps the most spectacular progress made by the Americans lies in the kitchen and bathroom of the average American home. Here labor saving devices have been developed, stimulated by intense competition, that give the consumer more for his dollar than in any other country in the world. Despite these facts the march of progress in better design has only started.

Functional and style obsolescence of the mechanical elements of the house will cause the average home to become obsolete far more rapidly than in the past. Indeed, it is entirely possible that Americans may some day trade their homes in for new models to some degree in the manner now common in the purchase of automobiles.







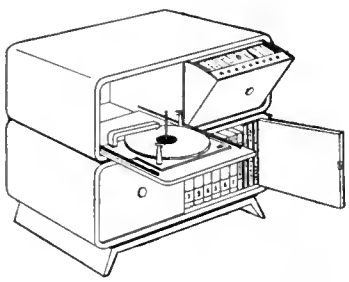
Interior view of the first sleeping car operated on the New-York Central Railroad. This car was

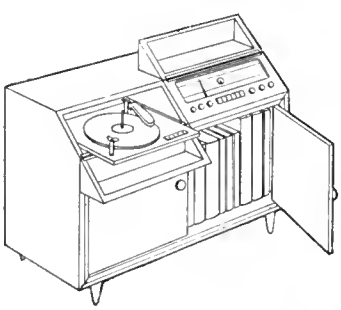
People have always traveled — usually with intense discomfort and often with danger. Our early railroads recognized that safety and low fares should be primary objectives and their success greatly encouraged the rapid expansion of our country.

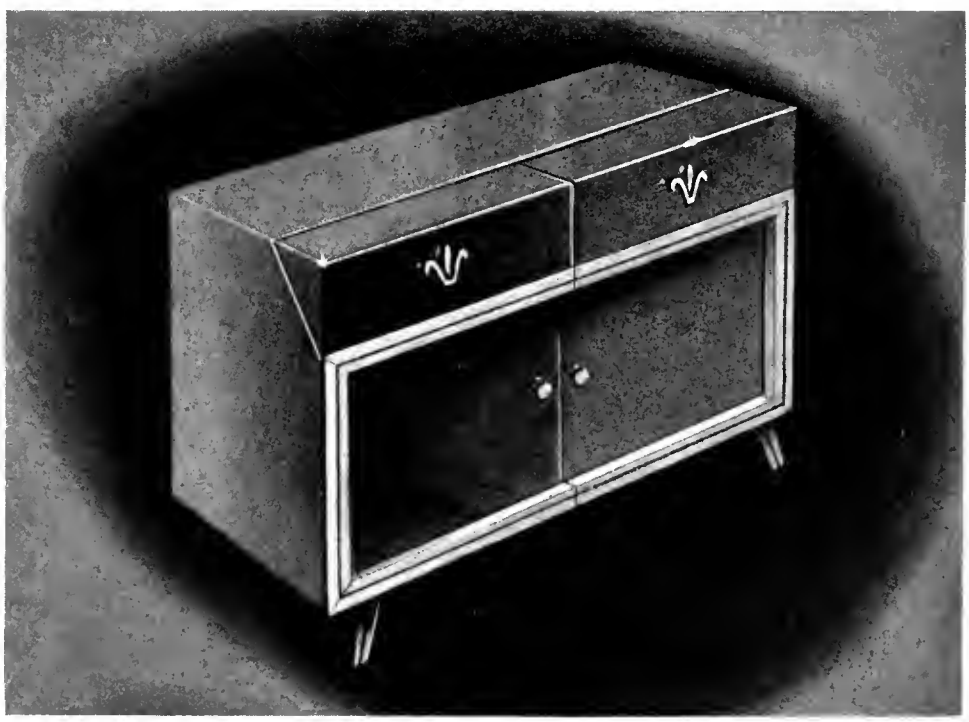
Today other objectives are needed to keep passenger revenues high — comfort and service!

The many months of critical thought given to even the smallest of appointments in a modern Pullman would astound the average traveler. No longer do we guess at passenger needs—we conduct surveys. No longer are we concerned with merely moving people from one point to another. We must consider their comfort and well-being from the time they enter the station in their home town until the time they arrive at their destination. Railroads, busses and airlines are beginning to realize that the actual transportation of passengers is only part of the job. Efficient and restful terminals, smiling hostesses, smart interiors and thoughtfulness in the little things that make life more pleasant can add greatly to customer good-will.

The transportation industry must do more than merely get them there. It must get them there comfortably and relaxed, in order to stimulate repeat business. In other words we are coming into an era where travel must be merchandised!





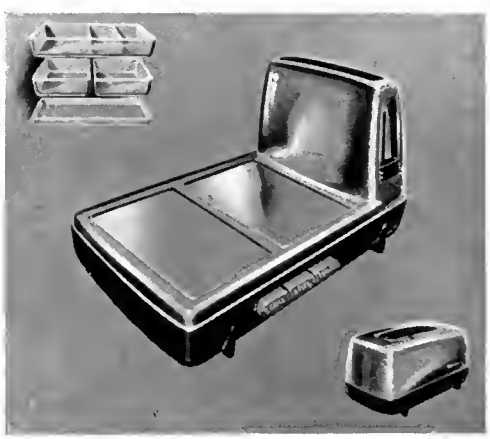


The radio industry is so highly competitive today that style is now a more important means of moving merchandise than either price or function. Distinctive style is not easily born—it comes only through constant search and intense creativeness.

New products start with the search for fresh ideas. These plaster models of radios were seeking something fresh and stimulating. Very few of them are practical for mass production as they stand, but with minor modifications many of them could be made so. This demonstrates that in the early stages of product planning, creativeness and distinctiveness should be considered above routine practicality.

This portable charger will put your battery back in condition without removing it from your car. Style can help merchandise the element of service in a gasoline station—indeed, it is one of the most important means of stimulating repeat business.

J. Gordon Lippincott, designer. Smith-Meeker Engineering Co.



New home appliances — particularly the wide acceptance of frozen foods—are rapidly changing American living habits. In a country where domestic help is scarce and growing scarcer, only well planned homes and more efficient electric appliances can assure us of increased leisure.

J. Gordon Lippincott, designer. Lewyt Corporation

Features are as important as style in product merchandising. In the development of this completely new vacuum cleaner a careful check list of features were made seeking maximum consumer acceptance. Style and engineering were then planned around these features to produce a distinctive new design.

The helicopter is perhaps the most facinating dream-child of the average consumer interested in flying. It must go through many more years of development, however, before the price is within reach of the average wage-earner. It is not beyond reason to believe that twenty-five years of research and development will do as much for helicopters as the first twenty-five years did for fixed winged aircraft, and when we look back at the "Jennys" of the first World War, that's anticipating something!

Packaging

The primary function of a package is to sell the product it contains. Therefore, packaging is one phase of industrial design which is very close to merchandising and advertising. In packaging, especially, it is important that the industrial designer and the advertising agency work in perfect cooperation for the maximum benefit of their client.

The second significant point to remember about packaging is that a package, like a trademark, can serve its best function *if it is good enough the first time to last for many years without a change.* For a classic example of a package which has memory value, let us consider Smith Brothers Cough Drops. This package, despite its lack of modernization, is actually distinctive in comparison with its competition and has tremendous acceptance which would certainly be lost if a radical package change were made. Thus any designer who modernized this Cough Drop package by taking the whiskers off the Smith Brothers or changing from black and white to another color arrangement would be doing this manufacturer a decided disservice. The package is *distinctive* now even though it is not modern. This is also true of many other packages which have enjoyed prestige, acceptance and recognition year after year — Coca-Cola, Shredded Wheat, Uneeda Biscuit, to mention but a few. Change should never be made for the sake of change.

There is only one reason for changing a package and that is to increase sales. First a market survey should be made to *establish the need* for an improved package. This should serve as guidance to the industrial designer. Then the proposed new designs should be carefully and critically studied by the client and his advertising agency in the light of competition, to make sure that this new design will truly increase sales. If there is any doubt in this latter regard, don't change!

Companies that merchandise hundreds of items can afford to make package changes rather often with little risk. All their eggs are not in one basket. But a company whose entire operation is centered on a specific package — Lucky Strike cigarettes or Coca-Cola for example — cannot afford to be wrong on any change. Here sample market testing of proposed new packaging is essential to guarantee beyond all question that greater acceptance will result.

Budgets on new packaging should be in proportion to dollar volume of sales. Research and market testing should be considered hand in hand with the design of the package itself. Actually, four out of five packages are obsolete today, and this applies to the more than 200,000 different kinds of merchandise now being packaged for sale throughout the country. This means that in the next few years the American consumer should see on the shelves more new packages than at any other period in our history.

There are four significant reasons for this very striking revolution in packaging. First, because of war-born improvements stimulated by research, the consumer in America today *expects something better* in the product he buys. The production miracle which industry demonstrated in the war has made the American consumer look with impatience toward a tremendous era of production for peace. The consumer anticipates and, indeed, demands better products than ever before. In order to have maximum consumer appeal, packaging must express these new and better products.

The second reason for careful packaging analysis of all products is the tremendous advance in material and packaging techniques stimulated by war needs. There are many new papers, plastics, foils, paints, pigments, dyes —indeed, all packaging materials have been improved and many new ones discovered. This means that the chances are better than fifty-fifty that your present package could be improved on the basis of materials alone. A thorough knowledge of these new materials and packaging methods are a "must" for any sound packaging designer. It should be the aim of every new packaging program not only to create a package with a greater sales appeal, but also one, if possible, for less money or of improved function. Only a thorough knowledge of packaging materials and machinery can accomplish this goal.

A third point is that several recent surveys conducted by nationally known corporations show that 54% of all consumer goods were purchased by *impulse buying*. That is, the purchaser did not actually plan on making the purchase but bought it on impulse because of attractive pricing, packaging or display. This means that if you can get Mrs. Average American in your store to buy a tube of tooth paste, she will, in most cases, buy something else on her way out.

The self-service store in the grocery field is here to stay because it is a less expensive means of distributing food. It will, of course, be improved.

J. Gordon Lippincott, designer. L. E. Waterman Co.

Good packaging plays so important a part in merchandising and advertising that the selection of the right package cannot be left to chance. Several hundred sketches were made in the development of this Waterman's ink package. About a dozen were selected for dummies and were carefully hand-lettered, so they would closely resemble the finished package.

A survey was then made to a widely diverse and unbiased group of average consumers, using these dummies. The final design (lower right) was selected by actual test and put into production. It represents a packaging improvement that is not made by guesswork, but rather by careful selectivity and market analysis.

Stores of tomorrow will no longer look like ugly barns, and the average woman will not always push those little baskets on wheels down endless aisles and stand in queues before cashiers.

Despite its growing pains, the self-service method of distribution will be continued in the grocery field and will also gain wider use in other fields. *This puts still another premium on packaging.* In self-service merchandising, your package is your silent salesman, and without a well-designed package which stands up in competition with neighboring packages your sales will suffer. It must not only be *distinctive* enough to be easily recognized among other packages, but it must also have enough eye-appeal to stimulate *impulse-buying,* which is the primary way *a package produces new customers.*

A successful package must meet all of these requirements. The *degree* of success depends upon style trends and other variables that can best be checked through a sales test of proposed designs.

The following is a check list of the *six basic elements of packaging* common to every package, regardless of the nature of the product:

Legibility

Good legibility is a requisite of every package, because legibility is one of the main stimulants of impulse buying. High carrying power and legibility are the primary things that catch the eye while the consumer is passing your display. This can be done very subtly. It is possible to have excellent legibility on a cosmetic package such as a hand lotion and still retain all the femininity, charm and glamour in the world. Legibility need not handicap a designer in his expressiveness. It is simply one of the "musts" of sound package design.

Color

Color is a means of making a package distinctive and of suggesting quality or contents. It is particularly important in food and cosmetic packaging because it can suggest a delicious taste sensation or a fragrant odor. Since the senses of color, taste and odor are all closely related, skilful use of color in packaging can create a mood of pleasant anticipation in the mind of the customer.

Color is also an important means of display. In a low-cost item like breakfast cereal, brilliant display is more effective than subtlety in achieving taste appeal. Correct use of color can only be determined by a critical analysis of the product — its price, market and the actual environment of display. Color is a most potent means of package improvement because it stimulates the emotions — the basis of impulse buying.

J. Gordon Lippincott, designer. Fuller Brush Co.

Packages are modeled for careful study of their final appearance. This hand lotion package has been carved from a solid chunk of Lucite and the cream jar has been machined from opaque plastic. These accurate models are the result of many weeks of sketching and selection. They now serve as a guide to sales and procurement.

Type

Most people have not the faintest conception of how expressive type can be. It can express smartness, speed, newness, vogue, tempo, anger, danger, love, affection, tastiness, gentleness, masculinity—indeed all the emotions, feeling and desires of which the human being is capable. It can express all these and still be legible. It is a means of expressing the character, integrity and quality of the product.

Display

Point of sales display is becoming increasingly important. In fact, the day is not far off when manufacturers *will be paying dealers for counter display space* the same way they are now paying for window displays, since merchandise on the counter or in the aisle will move many times faster than merchandise on the back shelves, which must be specifically asked for by the customer. For this reason, a greater percentage of the advertising dollar should be spent in display and in improved packaging.

All displays should have a *dominant feature* — a "bull's eye". People dislike making decisions and the question whether to buy this or that often results in the easier conclusion of postponement. This is the major weakness in mass displays of merchandise. For example, on a large rack displaying fifty magazines no single magazine is outstanding, and hence there is no single *outstanding punch* to make the passer-by stop, pause, and buy. Window displays chock full of merchandise and counters overflowing with a glittering array of goods have been proven successful by Woolworth and are the basis of much modern merchandising. But they are monotonous; they should be sparked with spots of dominating display. If there is no focal point in a mass display of merchandise, the eye can wander rapidly over everything and rest on nothing – passing without interest.

It is particularly important in studying a package to compare it with its competition. A package should be judged as the consumer judges it — *in display beside competitive packaging.* A package may be beautiful when enshrined alone against a simple background, but its true excellence is demonstrated only by the way it stands out in mass display in mass selling.

Memory Value

Memory value in a package is important. This is the primary reason for making packaging changes gradually and as seldom as possible. It is also the reason why, when a packaging change is made, one must feel absolutely confident that the change will increase sales. Memory value is largely the result of *distinctiveness*—a package that stands head-and-shoulders above its competition. There are several means of achieving memory value: a distinctive name, distinctive type, distinctive color, or a distinctive symbol or trade mark. It is important to realize that the average person will remember a picture better than a name or word. We Americans are picture and cartoon conscious, and a visual trade mark which ties in with the name of the product will aid memory value.

J. Gordon Lippincott, designer. Dr. Pepper Co.

Every packaging assignment has its own merchandising problems. These are studies seeking a new crown closure for a carbonated beverage. High legibility, quick identification value, and high memory value are required. Despite its small size, the closure should also tie in with all other packaging and outdoor advertising. It should be easily identified under water, upside down and mixed in with the closures of leading competitors. Only the careful testing of many hand-painted samples can result in a selection that will assuredly increase sales.

Function

Packages are becoming far more functional and it is necessary to design them so that it is easier to use, measure and store their contents. Re-use value in packaging has always been a sales stimulant. Christmas fruit cake containers and fancy glass and wood candy containers are but a few examples.

Most of the packages in use in America today were designed by the packaging supplier and, as such, they do not represent a truly unbiased approach in guiding the client. The glass companies, can companies, cardboard box manufacturers and so on all have their own staff artists and naturally emphasize their own packaging media. If a manufacturer has packaged his product with the same material for years, the chances are pretty good that there are other and newer media available today that could be found upon investigation. The great value of the industrial designer as a packaging consultant is that he has worked in *all* media and knows *all* the major packaging suppliers, with the result that his client gets unbiased guidance on packaging materials and methods which produce maximum sales success.

J. Gordon Lippincott, designer.
Eberhard Faber Pencil Co.

In addition to the many redesigned packages of old and established products, the consumer will be bombarded with more *new products and new packaging with new brand names* than ever before in history. Expanded industrial capacity and research stimulated by the war will result in new entries in nearly all fields. This will mean that far more money and effort will be spent in advertising and point of sales display in the next ten years than ever before. The prime function of any *new* product is to make that *first* sale through impulse buying – to break down the habits of established buying. For this reason alone, every manufacturer should critically study his present packaging seeking possible competitive improvement.

In conclusion, we cannot emphasize too strongly that the average woman is far more susceptible to good packaging than the average man – a fact that further strengthens the importance of good packaging. Remember that better than 90% of all packaged merchandise is bought by women. Design and the arts are not products of the intellect as much as of the emotions. The basic appreciation for color and form, texture and pattern – and, indeed, all art expression – is an emotional instinct. In this instinct, woman is far more sensitive than man. This principle is just beginning to be understood by industry, and it is profoundly influencing packaging and merchandising methods.

Your package is your silent salesman. Put yourself in your consumer's boots and see if your salesman deserves a raise!

The Industrial Designer's Place in Architecture

The industrial designer is concerned with architecture wherever it involves *merchandising* or *mass production*. Gasoline stations, stores, theatres, airports, railroad terminals and prefabricated housing — these are all merchandising a commodity or service and, since the basic talent of the industrial designer is to apply art to merchandising, these architectural structures are within his field as a consultant.

Architecture is the art of building for use, and by this definition it is apparent that the function of *merchandising* is as important as the esthetic consideration of the building shell. Modern architects and industrial designers are working hand in hand toward this end. This is as it should be since the actual structural detailing and the supervision of building erection are by law the responsibility of the licensed architect, and the contribution of the industrial designer is largely one of cooperation in basic planning and merchandising.

The relationship of the modern architect and industrial designer is often misunderstood by the public and within the two professions as well. Industrial design, as a relatively young and often brash newcomer, has abandoned tradition, sought publicity, and in general behaved in a manner that has

Gasoline stations are modern architecture applied to mass production and merchandising. A well designed installation can move a greater dollar volume of merchandise for a given capital investment. When the right design is found and proven by actual test it may be duplicated many times across the country.

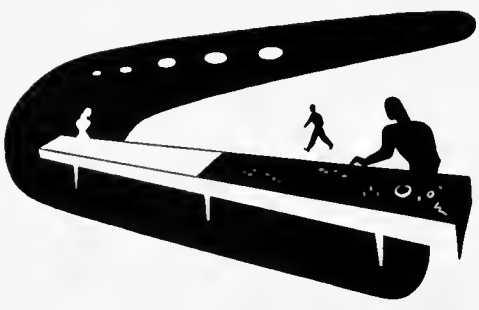
raised the eyebrows of the older profession. But industrial designers have made their contribution in modern thinking, and this often in cooperation with our more pioneering architects.

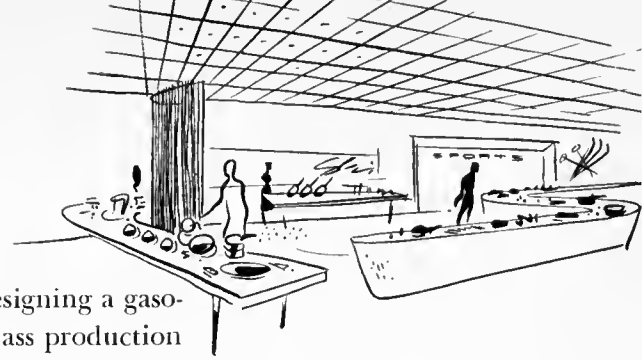
Actually the distinction between the architect and industrial designer is very slight; indeed it is probable that more industrial designers come from architectural backgrounds than any other source. The architect is concerned primarily with the art of building and the industrial designer with the art of mass production and merchandising. It is not surprising that their efforts should overlap, and where they do the result is a cooperative enterprise with common objectives.

For example, designing a gasoline station is not a problem in building an architectural monument. *The primary problem is to see that the client enjoys the greatest possible return from his capital investment.* Since the gasoline station will be duplicated many times with minor variations, it becomes a problem of mass production. Since gasoline stations occasionally fail in one location and are moved to new sites, high salvage value is desirable. Basically, then, a gasoline station *is a problem in creating a large display for merchandising oil products and automobile accessories.* The purpose of the gasoline station itself is, first, to attract the motorist and make the initial sale and, second, to provide shelter from the elements so that attendants may perform operational functions and patrons may be exposed to impulse-buying opportunities.

From first to last, the gasoline station's basic problem is merchandising. Every square foot of a station must have a purpose and a reason, because every square foot must yield a return from the investment. The problem resolves itself into the question of how we can display merchandise attractively to increase sales and at the same time arrange all operational functions to reduce labor, upkeep, and all other overhead. Mass production enters the picture because the station must be modular in design so that for small sites it can be small and for the larger cities sites it can be expanded. Hence the materials to be selected are likely to be steel, glass and other industrial materials rather than brick and stone which have been used so long.

It is also necessary that the gasoline station design tie in with all other phases of the client's product merchandising. The packaging must be integrated with the gasoline station displays, signs, trademark insignia, station attendants' uniforms and so on. In order that this design integration may be most fully achieved, the same industrial designer should do the displays, the packaging and the gasoline station itself, thereby providing





complete unity in design as a maximum stimulus to sales. Designing a gasoline station is 90 per cent a problem of merchandising and mass production and only 10 per cent a problem of architecture.

The same situation is no less true of a department store. In the past, architects who designed large buildings with impressive facades and monumental stone work did not give adequate consideration to flow of traffic, display, and lighting. A tremendous proportion of the cost of any department store building was spent originally to make it modern and up-to-date, while inadequate attention was paid to the cost of keeping it that way.

A department store again is not a monument to Marshall Field, John Wanamaker or R. H. Macy & Co. *It is simply a large shelter from the elements which houses a mass display of merchandise.* It has one and only one function — to move that merchandise. It is recognized that in the average modern city no one looks at a store exterior *above the street floor display windows.* It is also recognized that the average store interior becomes obsolete in a surprisingly short time — three to five years. Here, again, the designer is faced with a completely different set of problems from those which architects have been called upon to solve in the past. Proof of the fact that architects have not solved this problem is that at this writing there are very few truly smart, completely modern department stores in the entire United States. We cannot design a department store in the small confines of this book but let us examine some of the elements of the problem that have been overlooked.

Recent surveys conducted by one of our largest nationally-known corporations show that over 54 per cent of all drugstore sales were based on *impulse-buying* — that is, the consumer bought more than half their merchandise without having planned to make those purchases before they entered the store. Department stores operate to a great degree on this principle of impulse buying. Nearly all stores advertise feature "leaders" and bargains that will bring in prospective patrons. Once they are in the store, impulse buying is presumed to stimulate sales. In recent years the percentage of impulse sales has been rising steadily and we still have just begun to scratch the surface. Every American woman likes to "shop". When stores provide truly attractive interiors and smart displays, shopping will become even more of a pleasure *and "shopping" means impulse sales.*

F. W. Woolworth made effective the first basic observation on impulse buying. He set out a mass of merchandise on counters so that consumers could see it without having to look through glass or any other obstruction.

With few exceptions, all of Woolworth's counters and, indeed, nearly all department store counters are open to the public in mass display for maximum impulse appeal. In other words, stores found that if they made it *easy for the consumer to see and feel merchandise, increased sales more than offset losses from theft, damage and breakage.*

Thus we see that in order to move merchandise, one must first get the customer into the store and, second, expose him to attractive displays which stimulate his urge to ownership.

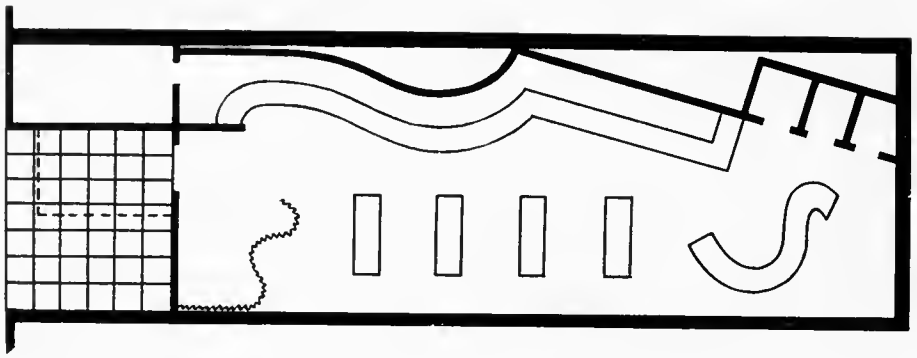
Too many stores in the past have been designed merely as large boxes with windows around the outside, electric light outlets in the centre of each bay crisscrossing the ceiling, a hardwood floor, plaster walls, and that's that! In such a structure, it was up to the ingenuity of the tenant to plan his own interior. A good department store, or indeed any other store, must be designed from the inside out. First, the designer or architect must study the basic elements of merchandising and then he must design the store, all interior displays and its lighting, *because displays and lighting are the store.* The four walls and the roof are nothing but shelter. They simply keep out the weather and control and focus the attention of the shopper. They make no direct contribution to a sale. Store designing is 90 per cent display and 10 per cent bricks and stones, and yet there are few stores in the United States today that have started with merchandise *first* and wrapped the shell of the store around departmental displays.

It seems strange that only recently have stores been designed in this way, because for years modern architects have been designing homes in this manner. The modern school of architects often speak of designing homes from "inside out"; they say that "form follows function", that "the human being is the modulus" and that his living needs, habits and desires should shape the home. This, of course, is as it should be. However, a store's entire function is merchandising, and merchandising cannot be achieved by the building shell alone.

No stores have been designed with sufficient *flexibility.* After all, nearly all stores experience seasonal selling. In the summertime outdoor furniture, bathing suits, sportswear and camping equipment sell in large volume, which means that these departments must be seasonally expanded. In the winter, skis, sleds and woolens require more space. For this reason, store interiors and displays should be so *flexible* that these changes can be accomplished with a minimum of personnel time and labor. *However, even more important than merely seasonal change is the basic need for change itself because impulse buying is based on change.*

Walter P. Margulies, courtesy Hotel Syracuse

The modern hotel is skillfully designed to provide comfort and service to its guests. With rising labor costs, it must be planned with utmost economy in space and materials. Good design can make a small room seem spacious — can make waste areas produce revenue. Like a department store, a hotel has something to merchandise, and good design plays its part in salesmanship.



The human eye tires rapidly and when it becomes used to an object, it no longer views that object as a novelty. And *novelty appeal, or newness, is the first law of impulse buying.* For example, if on your way to the office one morning you noticed that all the hydrants were painted purple, you would probably remark to your friends: "Say, did you notice that all the hydrants have been painted purple this morning — I wonder what's up?" The next morning you would probably notice the new color scheme again but the chances are that by the end of the week you would have *accepted the fact* that the city had decided to paint its hydrants purple and soon you no longer would notice in passing that there was anything whatever unusual about the hydrants.

The same analogy may be applied to the interior of a department store. If a woman becomes accustomed to a department store interior because she always finds the aisles having exactly the same arrangement with the same display in the same location, she will pass through these aisles on the way to her destination in some other department, never noticing the merchandise on display. She simply has "become used to" these displays, since to her cursory vision they are the same as they were last week and last month. Every counter past which she walks is a potential impulse sale loss. The basic aim of any new store should be *continual change to stimulate impulse buying.*

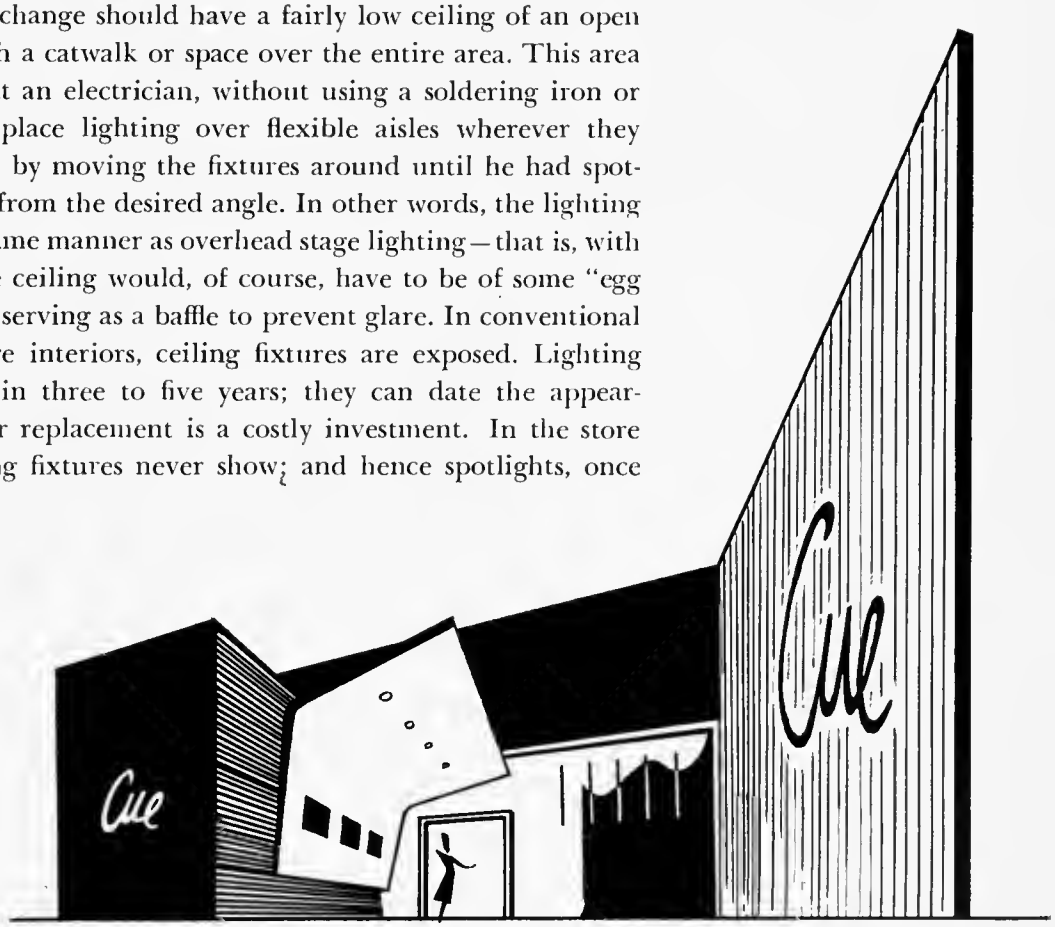
No woman should be able to go into a store in January and find the aisles and displays substantially the same as on her last visit in September. The store interior at the later date should be as freshly different as if it had been completely remodeled and restudied. Every counter should have new, inviting appeal. Nothing should be time-worn or monotonous. *Best of all, this store would never grow old or obsolete.* If a new competitor built another store across the street, this store would not be faced with a modernization program because *it is planned and designed for change and hence continually grows with the times.*

This means quite literally that a store should be designed like a stage set. Every display, every counter, the flooring material — indeed every element — should be planned for rapid mobility with the least expenditure of labor and upkeep. It should be possible to change the entire floor layout of the store over a week-end and do it without teams of carpenters and painters. The same art team that plans the store windows should be able to handle store interior changes with a minimum of labor.

One problem of such a store, based on change, is lighting. Ceiling fixtures have always been directly over the aisles, and the aisles have always been parallel to the walls and parallel to columns (columns, of course, should be completely eliminated wherever this is practical). This arrangement has given the average store interior a grid-like pattern. The aisles look like bowling alleys; they do nothing to stop the shopper for impulse buying. In such conventional store layouts, the ceiling fixtures really determine the aisle arrangement — ceiling fixtures which were laid out by the architect and based on column spacing without regard to merchandising.

Ceilings of today's department stores are so full of lighting fixtures that they *compete with merchandise for attention.* The modern department store should have no lighting fixtures, as such, on the ceilings at all. The eye should never tend to wander upward in a store. The merchandise should be so attractive and the lighting fixtures and ceiling so subdued that the focus of attention is all at or below eye level.

The store based on change should have a fairly low ceiling of an open cellular construction with a catwalk or space over the entire area. This area would be so planned that an electrician, without using a soldering iron or a pair of pliers, could place lighting over flexible aisles wherever they might be located, merely by moving the fixtures around until he had spotlighted the merchandise from the desired angle. In other words, the lighting would be treated in the same manner as overhead stage lighting — that is, with complete flexibility. The ceiling would, of course, have to be of some "egg crate" cellular structure, serving as a baffle to prevent glare. In conventional methods of lighting store interiors, ceiling fixtures are exposed. Lighting fixtures go out of style in three to five years; they can date the appearance of a store and their replacement is a costly investment. In the store *based on change,* lighting fixtures never show; and hence spotlights, once



installed, can be moved around at random for years without requiring replacement.

The primary tools of the architect industrial designer in merchandising are lighting, display and color. These are also the three basic elements of good store design. All other phases, such as planning for traffic flow, providing large elevators and convenient ladies' rooms, are, of course, necessary, but these are things that have been adequately done in the past. Lighting that really dramatizes merchandise, displays that show it to its best advantage without competing for attention, and fresh, buoyant colors that enhance merchandise – all these improvements can be provided.

* * *

Airports and air terminals are another field that industrial designers are now attacking in cooperation with our modern architects. This presents a tremendous number of problems, many of them having no precedent on which to base planning. For example, at our airport of tomorrow, we may anticipate planes of such size that there will be two levels of departure from the plane itself—the upper level for passengers and the lower level for baggage. The terminal must be designed for a minimum of friction in the flow of passengers to their desired plane and of baggage to its desired destination. There are entirely new reasons for this practice that have never existed before in the transportation field—namely the crucial requirement to cut to a minimum ground time for transport planes. *Airplanes earn revenue for their owners only when they are in the air.* They not only earn no money while standing by idly at an airport during loading, unloading and servicing operations but actually cost operators very large sums. During World War II, airlines with notably inadequate equipment did a marvelous job in keeping their planes in the air and cutting ground time to a minimum. Indeed many planes flew 15 hours out of every 24-hour day and operators are now aiming at a performance even better than this.

Non-stop flying time from Chicago to New York is only a little over three hours, but often a full fifteen minutes is lost at both ends in getting passengers and their baggage from the plane to the connecting limousine. The cutting of this ground time loss is largely a matter of better terminal design plus accessory equipment. Architecturally, it is a problem of space planning and timing—one that our architects are thoroughly capable of solving but one that must be coordinated with the work of aircraft manufacturers and plane operators and the use of their specialized operating equipment. There must not only be functional coordination in this planning but esthetic coordination as well, so that the entire appearance of any one

airline's capital investment and operational equipment is integral in nature for maximum memory value and sales appeal.

Another essential factor of airport design: *Any capital investment made by airlines in buildings and equipment should be written off rapidly.* Airlines simply cannot afford to build air terminals the way railroads have built their terminals — as monuments to last forever. The aircraft industry is moving so rapidly that even aircraft manufacturers themselves have no idea what kind of planes will be flying 25 years from today. All they know is that planes will certainly be different from those we have now and that new and better planes will make our present air terminals obsolete. Therefore, air terminal designs should be flexible, salvable and, whenever possible, modular for further expansion at relatively low cost.

The Washington air terminal, which was completed only a few years ago at tremendous cost, is an example of what we should *not* do in our future air terminals because *this terminal is already obsolete.* It is an example of inadequate planning for ground servicing of planes and for maximum efficiency in moving passengers, baggage and service equipment to their destinations with speed and without bottlenecks and tangles. Adapting this airport to double-deck structure will be an extremely costly undertaking and yet it is most likely we shall have double-deck transport planes in the near future. Around them, all new airports will have to be planned. If the Washington Airport, a leader only a few years ago, is already obsolete, we may expect air terminals now on the drawing board to be obsolete by 1965 or earlier!

Courtesy Architectural Forum

The airlines have done an excellent job in improving speed and passenger comfort in flight. The big problem now limiting the continued rapid expansion of the air transportation industry lies in the adequate solution of modern air terminals. These terminals are so costly and, despite the best of planning, become obsolete so rapidly that the solution is now taxing the best creative brains in the country. Carefully planned scale models are one phase of the solution.

Prefabricated housing is another phase of architecture in which the industrial designer is now working, because of his knowledge of mass production and consumer tastes. One of the major failings of architectural education in this country is that before the war *nine out of ten American homes were designed without the aid of an architect.* For too many years, the architectural profession concerned itself with skyscrapers, factories, large estates and monuments and not enough with our great national need — good low-cost housing. In recent years, our architectural schools have recognized this need, and tremendous energy has been devoted to the problem of the $3,000 to $5,000 home, with the result that in the present building boom we should find many new and interesting solutions to the problem.

Probably one of the major reasons why architects have not designed more low-cost homes is that they could not afford to do so on a percentage-fee basis. It is just as much work for an architect to design a really efficient $5,000 home as to plan an attractive $15,000 home. Indeed, if anything, the low-cost home was far more taxing on the architect's ingenuity and yet its return to him was only one-third that of the $15,000 home. The prefabricated home, based on mass production, will permit the talented architect to realize a financial return common to this technique in the same way that the industrial designer has profited in such items as automobiles, refrigerators and household appliances.

The Fuller house is an ingenious conception brilliantly engineered, but it is bucking deep-rooted traditions — the woman's concept of what a home should be. It will undoubtedly influence prefabricated home design, but is not likely to outsell less efficient, though more conventional, housing.

The Gunnison home is more nearly the average American woman's concept of a dream cottage, and she buys it despite the limitations in livability inherent in traditional designs. Consumer tastes in housing change slowly. For maximum sales success, mass-produced homes should not look mechanized and above all, should have some individual distinctiveness and a personality.

The bathroom and kitchen are the most modern rooms in the American home today. This is because the greater efficiency of home appliances and modern plumbing fixtures have forced tradition aside in favor of improved function. This trend will gradually become accepted for other rooms of the house and indeed, the home itself. This does not mean that all our rooms should be as severe and efficient looking as the modern kitchen—a criticism of some modern design of the past. It does mean that modern as a style is proving itself more livable and therefore is gaining in popularity.

Prefabricated housing has had three basic problems to lick and all of them are tough ones. The first is that the building codes over our entire country are completely unrelated and obsolete. Most cities, for example, have building codes requiring outside wall thicknesses from four inches upward, whereas in the mass-produced home we can achieve adequate strength and insulation in walls as thin as two inches. One thing that could give prefabricated housing a tremendous stimulation would be the *creation of a universal building code* by the Federal Government. However, since this might interfere with States Rights, the chances of achieving such a simple solution seem pretty remote. The probability is that alert communities will keep their building codes up-to-date while the less alert communities, dominated by labor unions and political bosses, will purposely keep the building codes as they are.

The second big hurdle that prefabricated housing must vault lies in the attitude of the labor unions themselves. Actually, the prefabricated home will be cheaper, chiefly because of savings in labor arising from the fact that factory fabrication and assembly are far cheaper than field fabrication and assembly. Visualize, for example, what would be the situation if you had to build yourself a car the way you have to build a home. You would be buying from 50 different suppliers — a carburetor here, a timing gear there, a wheel somewhere else and fabrics and cushions from the local upholstery shop. Imagine all these various and unrelated parts being dumped in your front yard from a dozen different trucks at different intervals over a month or so. Then think of yourself as hiring six or eight mechanics all from different unions, most of whom would not be permitted to pick up parts, nuts or bolts assigned to any other union. Finally, think of putting all these men together assembling your car. Yes, you've guessed it — your automobile would cost you $5,000 or $6,000 instead of $1,250, and it wouldn't be half so good.

Mass-produced housing, requiring more man-hours in the factory and fewer man-hours in the field, can cut building costs radically. Early automobiles cost $3 and $4 a pound. Today, costs are nearer to 50¢ a pound and

we are getting a better automobile! The same is true of all our appliances — radios, washing machines and so on.

Yet while industry operating on a mass production basis has achieved this record, housing has risen steadily in cost per cubic foot. It is highly questionable whether a house built in 1940 is much better than one erected in 1920 — when you take away the modern heating system and modern appliances. One of the prime reasons why housing has stood still is the shortsightedness of the labor unions which have insisted on handicraft methods of production. Actually, building trades workers are sharply limited in earnings because winter's cold curtails building. Mass production would keep more workers busy twelve months of the year. Also, the housing needs in the United States are so tremendous that prefabricated housing could not possibly mean technological unemployment. On the contrary, lower cost and better housing would mean more jobs for the building industry and more and better homes for the American worker. The transition would mean, however, that a good many carpenters and plumbers would have to change their jobs and methods of work and get into industry, and this is causing resistance. While labor unions and their policies are not the province of the industrial designer, they affect his designing appreciably because union codes have laid down laws which limit what the designer can and cannot do and, thus fenced in, the designer must work at extreme disadvantage.

The third hurdle facing prefabricated housing is consumer acceptance. This is the most substantial of all. *No one has yet brought out a prefabricated house that the average American woman wants to call her home.* They simply do not appeal to the feminine taste. The problem of eliminating that mass production stamp of uniformity and sameness has not been solved. Prefabricated homes do not yet fit gracefully into their environment, be it Arizona or Maine.

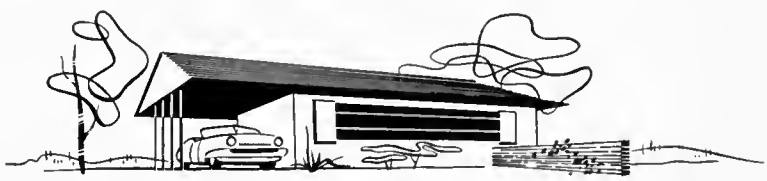
This is definitely a job for the designer, since his strongest asset is a knowledge of consumer tastes and desires. As long as the prefabrication industry turns out houses that look like cheese boxes with holes cut in them, they will not have wide consumer acceptance regardless of price or need.

Careful study must be given not only to the functional layout of the home but also to wide flexibility of arrangement based on the consumer's need and choice; adequate feeling for proportion, texture, color and the subtleties of applied art that make the home really attractive. These elements do not raise the cost of a prefabricated house. They merely require better planning and a better application of esthetic principles.

One-third of the cost of the average small home is absorbed in mechanical equipment — such items as plumbing, heating, electric wiring and appliances. Maximum study should therefore be devoted to this area in order to achieve economy. The mechanical elements of a home are ideally adapted to mass production and it is very likely that more manufacturers in the near future will bring out a *mechanical heart* for the low-cost home. This mechanical heart would be put in the center of the house and the living areas would be literally wrapped around it. In this heart would be the heating, plumbing and wiring systems. One wall would be devoted to kitchen equipment and another wall to bathroom fixtures. Thus within one unit would be all the mechanical needs of the low-cost home. Since this mechanical heart could be assembled in a variety of ways, it would permit perfect flexibility in wrapping the home around it. There would be no radiators on the outside walls, no horizontal or vertical plumbing, no very extensive electric wiring to be done. The mechanical heart would take care of all of this. If this mechanical center were manufactured in high mass production and sold to the consumer with a single sales cost and financing charge, it should bring about very substantial economies over present methods of hit-or-miss buying. Proper styling of these mechanical features would go a long way toward selling the American woman who, after all, spends more of her waking hours in the kitchen than in any other room in the house.

The prefabricated housing industry has pretty well standardized the eight-foot ceiling, mainly because dry wall construction has come in four by eight-foot panels. Actually, this ceiling is too high for the average small home and it makes a small room, nine by twelve feet, for example, seem badly out of scale. A far better ceiling height for the $3,000 to $5,000 home would be seven feet, three inches. Modern furniture is becoming lower and smaller so as to be in scale in smaller rooms. Lowering the ceiling height nine inches makes a surprising improvement in room proportions.

Indeed, I have had personal experience in this regard, having designed rooms in my own home with seven foot, three inch ceilings. When I ask guests to estimate ceiling heights, they nearly always guess eight feet and are surprised upon closer scrutiny to realize that they are actually far lower. A room may be small but if furniture, drapes, windows and ceiling are all in proper proportion and scale it can feel comfortable and even luxurious. This lowered ceiling height for the prefabricated home would permit a lower roof line on the exterior of the building, thus making it appear less boxy and closer to the soil. Obviously, it should save somewhat on material



and should aid heating in the winter.

It is thus apparent that the acceptance of prefabricated housing is not based on any phenomenal new approach to the problem but rather on solving successfully many hundreds of small details. *The difference between a good design and a mediocre one often lies not in some single outstanding point but rather in a summation of smaller points, all solved better.*

Another problem the prefabricated house planner has considered inadequately is the desirability of built-in furniture and provision of adequate storage. Built-in furniture is an absolute necessity to the small home, since it so greatly increases apparent living space. For example, there is no need for the bureau as a piece of furniture in a bedroom. The storage wall and specially planned closets are far more useful than a bureau for clothing storage. Moreover, they take up far less space. Women are particularly sensitive to "a place for everything and everything in its place," and I have yet to see a woman who feels that her home has enough closet space. Also, closets should not be dark, unplanned cubicles with a shelf at the top, a pole for coat hangers underneath, and shoes scattered all over the floor. Closets require the same careful engineering and tailoring that is expended on an efficient kitchen. Actually, a closet is a piece of built-in furniture and every cubic foot of it should be usefully employed. If closets of this type were built by the average carpenter in the field, they could run into a considerable sum of money and this is the probable reason why most builders have simply left closets as they are. In a prefabricated house, however, where adequate study can be well afforded and where these parts are made with substantial tooling, well integrated closets and indeed all other built-in furniture could actually be produced cheaper than the "borax" furniture which now fills the average home.

The prefabricated home will be sold largely by its interiors. Functional and well-planned space, adequate storage and living areas, a fine use of color and materials — these are things that appeal to the prospective home buyer. The average person sees the interior of his home many hours a day compared to the relatively short time he sees its exterior. While *all* planning is important, the interior planning is by all odds the more important when it comes to *living* in a home. Despite this fact, nearly all real estate advertising features the exterior of a home and then realty men wonder why it does not have feminine appeal. The automotive industry found increased sales through appeal to the feminine buyer when its leaders considered *interior design* carefully — attractive upholstery, easier steering,

a finer use of colors and more comfortable seating. When the builders of prefabricated housing design a home in which even the smallest detail has been analyzed and studied for feminine appeal, you can be sure they will find a mass market.

The exterior of a prefabricated home is of course important, too, and for its finest solution landscape gardening must be used. I, for one, feel that a prefabricated house should never be sold without having foundation planting included as part of the price. No other single feature would be more helpful in merchandising the prefabricated house. *After all, it is landscaping that turns the exterior of a house into a home.*

Thus, in architecture as in all other forms of product planning, the industrial designer critically considers human needs and merchandising problems in order to provide sound economic solutions. He does this in cooperation with the modern architect and engineer—because as architecture, like many other fields, becomes more highly integrated it requires the combination of many experts to achieve its most successful solution.

Architectural Forum

One of the great needs in all homes is adequate and carefully planned storage. This problem is aggravated because increased building costs are forcing the average American to live within ever smaller cubage, while at the same time the generally rising standards of living are adding to his possessions. Storage should be planned as an integral part of the home—a contributing reason why modern interiors are more livable.

Color Stimulates Sales

Nearly all manufacturers have recognized that color is a means of increasing sales appeal. Technicolor movies draw larger crowds than black and white films. The color pages in our national magazines have been steadily increasing in number and our large mail-order houses have discovered that color plates in their catalogs more than pay for themselves, despite their greater original cost, by moving more merchandise. The ever-growing popularity of plastics during the past ten years has been based more on their wide adaptability to color, perhaps, than on any other single factor. Color is a means of stimulating human emotion, and therefore impulse buying and the desire for ownership.

In nature, color has always surrounded mankind. In contrast with the countryside, bright and ever-changing, our larger cities are drab and dull because we have not had the technical means to make them otherwise. Naturally, man prefers a colorful environment, and with the development of modern color-technology, we may anticipate a future in which all phases of living will be brighter.

However, this trend will pose a difficult problem in mass production because varying the colors of a line of merchandise increases the size of inventory and multiplies the *risk* of unfavorable consumer acceptance. While color has often increased sales appeal, it has also, when misapplied, forced retailers to cut prices below cost in order to sell slow-moving goods. *The right color can enhance sales appeal; the wrong color can prevent merchandise from moving at a profit.*

Selection of the right color is not easy — it requires expert guidance. Part of the difficulty lies in the often-overlooked fact that colors are seldom seen as part of an object by itself. Our visual impression is nearly always influenced by the environment in which the object is seen. A chair upholstered in a colored fabric will produce one sensation in a blue room and an entirely different sensation in a yellow room. Also, the color will seem different when illuminated by daylight, incandescent light or fluorescent light. *The color impression one receives when viewing an object is the combination of the object's color and its environment.* Since products are made in a factory environment and the manufacturer cannot possibly anticipate all the surroundings in which his product may be used, he must of necessity choose colors he hopes will appeal to *average* consumer tastes.

The manufacturer is therefore faced with three problems—*color selection, color specification, and color merchandising.* Color selection must consider tradition, environmental buying habits and the market. The lower the price, the stronger the color. This is because lower priced articles are

bought primarily on impulse and bright colors are needed to attract attention. Kitchen utensils usually have red handles—this traditional color preference is established by sales. Red is an excellent display color—appropriate to low cost items. But try and sell a red refrigerator—where color preference is white!

The well-educated and wealthier consumers prefer subtleties—subdued colors. Higher priced items appeal to this taste. Compare the bright colors in linoleum flooring to the subdued colors in a fine carpet.

Environment also influences color sales—the far West preferring lighter brighter colors as compared to the East. The new synthetics are stimulating a trend toward lighter colors. We now have non-staining materials, such as plastic coated fabrics and wallpapers, improved paint finishes and less fugitive colors. In the old days colors were dark in order not to show dirt—compare the Pullman interiors of bygone years to those of today! *Color trends are toward lighter values.*

Market studies can indicate consumer color preferences. Consumers expect certain products to be made in certain colors—these are strong habit preferences and it is foolish to buck them. But color habits do change and many color preferences are based on unwarranted foundations in the first place. *The color foundation of a line should be based on consumer preferences established by research. Distinctive merchandise or "leaders" may explore new color trends—preferably in higher priced items.* Many manufacturers have too many colors in their line—some that do not make profits. Consumer research can establish the colors that sell and eliminate those that do not.

Color specification is a means of assuring that a color selected by careful research will be produced in mass production. This is particularly important where sub-contractors or outside suppliers are contributing components to a final assembly that must be in color harmony. Here one should realize that an absolute specification is impractical and that a color "tolerance" – or allowed variation from the color specified – should be noted. There are several excellent systems for color specification.*

There are no ready formulas for color merchandising; selection to a large extent still depends on good taste and sensitivity to color style trends. One new color arrangement that has proven highly successful in recent years and which offers unusual merchandising opportunities is the method

* MUNSELL: Munsell Color Company, 10 East Franklin Street, Baltimore, Maryland. OSTWALD: Color Harmony Manual, Container Corporation of America, 111 W. Washington Street, Chicago, Illinois. Maerz & Paul Dictionary of Color, McGraw-Hill, New York, New York. Textile Color Card Association of the U. S., Inc., 200 Madison Avenue, New York 16, New York.

called Quantacolor, which has set up four basic color families or palettes, based on four moods and environments common to all of us. This four-family color idea originated with the theory that in nature itself light and, therefore, colors vary during different hours of the day and may be classified into four separate and distinct families. called quantas.

Each quanta contains the full range of the spectrum or rainbow, as it is seen at different times of day. The first family includes the colors as seen by morning light, the second by noon light, the third by late afternoon and the fourth by sunset. The color variations from group to group are subtle, yet the difference becomes immediately—and unpleasantly—apparent when a shade from one quanta is held against the corresponding shade in another quanta. The same clash occurs when an article in a color from an alien quanta is introduced into a room or a merchandising display.

Study of human color preferences has shown that all people have a tendency, based on their individuality and the physiological make-up of their eyes, to prefer one quanta above all others. This tendency shows most clearly in the paintings of artists. Van Gogh is an example of those who preferred the radiant, fresh colors of Quanta-1 of the early morning, while Renoir has expressed most of his work in Quanta-2 with the dry, sharp, vibrant colors of noon-day. To mix the quantas of these two great painters would produce very unpleasing results.

Knowledge of these color divisions makes it possible for dealers to display merchandise so that adjacent colors enhance each other, and to avoid clashing color schemes that prevent sales. Merchandising experience has shown that grouping house furnishings in this manner is helpful also to the customers, enabling them to select well-integrated color schemes with far less doubt and confusion.

Quantacolor can be relied on to save time in correlating color and design and to save money by doing away with those wrong color schemes that just won't sell. Modern production methods frequently require several artists on one design or layout. Each artist may have a different color quanta and prefer to use colors of his own family. If this occurs, the work as a whole will be a color-hybrid. Quanta-coding is a means of preventing such a result.

According to the Quantacolor theory, this preference all of us show for one color family is a far-reaching thing. It governs our likes and dislikes, our choice of styles and our manner of creative expression. One can foretell a designer's general approach without seeing his work, merely by finding his color affinity. This is not guesswork; it is based on years of careful ob-

servation, and painstaking analysis and color-classification of thousands of designs and of the works of the world's great painters, decorators and designers. Quantacolor has found that any artist, when uninhibited by extraneous considerations, works exclusively in the colors of only one palette and that his creative style is unalterably tied up with his color preference. For example, if the paintings of Rembrandt, who worked in the rich, mellow and glowing colors of the fourth quanta, were to be reproduced in the vibrant, sharp, dry second-quanta colors of Michelangelo, they would be completely unpleasing because the painter's style was governed by his own natural quanta.

In order to make the Quantacolor theory visually and practically available, there have been created four large panels of removable slats, each of a pure color and each different from every other. Each panel shows the full spectrum of its quanta, and the display as a whole embodies all the variations of the primary colors, for instant use in harmoniously correlating color and design.

Taking the guesswork out of color choosing is an inestimable aid to mass-manufacturers, who are frequently timid in their use of color because of fear of unusual or distinctive color combinations. The easy way out, except for a born colorist, has been to rely on known combinations, or to tone colors down to minimize clash. This compromise, of course, veils harmony as well, when it exists. Reliance on nature, where color discords never occur, and on the instinctive harmonies of great artists, insures a minimum of error.

Quantacolor can be of equal assistance in merchandising, particularly for large stores. Arrangements of colors and displays are often much better in small specialty shops than in those where displays are handled by decorating staffs. In a small shop, buying and arranging are usually done by one person who will tend, as a matter of personal taste, to remain within the broad confines of one quanta and consequently select things that will look well together. In the larger stores, many of the things displayed together have been bought by different people, each preferring his own quanta. The customer seeing the display may very easily pass over exactly the color she is looking for because the discords have soured all the visible colors.

Quantacolor has been called upon by increasing numbers of retail stores to install their color-coding method. Bloomingdale's in New York, for instance, use the Quantacolor yardstick in merchandising. Scruggs-Vandervoort-Barney, Inc., in St. Louis, have even redesigned their drapery and upholstery department and now code, break down and display all their fabrics and home furnishing accessories by quantas. To facilitate this, the merchandise

Scruggs-Vandervoort-Barney, Inc.

is arranged in four quarters of a large circle, the hub of which consists of the double panels of the Quantacolor yardstick. This arrangement permits all the merchandise to be displayed in harmonizing groups. Each quanta grouping has a small cabinet with sliding trays to which are attached samples of everything that has been quanta-coded—fabrics, carpets, woodwork and wallpaper—presenting a complete, coordinated color selection.

Designers and decorators, too, find the yardstick a time-saver in correlating patterns and colors. Frequently a mysteriously slow-moving pattern, upon Quantacolor analysis, will be found to contain perhaps one color from a quanta alien to the rest of the pattern. This color, though it might be a minor one, will render the entire pattern unpleasing to the eye. Changing it to one of the same quanta will give the pattern new eye-appeal.

Once a person has determined by his own choice his natural quanta preference, he can use the code as a guide for all his purchases—home furnishings, clothing, even automobiles. Wide adoption of quanta-coding within a large department store or mail-order house would permit far more intelligent buying on the part of the consumer and greater security and less risk on the part of the manufacturer. Quantacolor is a means of having distinctive color schemes with greater standardization and far fewer failures.

The advantage of color coding to mass producers is apparent. It would permit the integration of all supplies, whether they are wall board, tile, textiles, wallpaper, furniture, clothing, hardware or any other of the thousands of things commonly used by the American consumer. It is being realized more and more that color is a prime means of design integration, whether within a home or a theatre, a store or a railroad.

Quantacolor is not a foolproof guide to color harmony but rather an intelligent means of merchandising color to a mass market, both from the

manufacturer's and the consumer's viewpoint. *Color is always subject to personal taste.* An executive should realize that his personal color preference may be entirely different from consumer averages. The important thing to remember is that color is always seen in relation to environment and while a color entity may be entirely satisfactory within itself, if placed in an environment that produces disharmony it will be unsatisfactory.

For this reason, manufacturers must anticipate the color environments of their products in actual use and plan accordingly. Since the manufacturer of radios or vacuum cleaners cannot possibly anticipate all the color schemes of the average American home, he now has but one choice—to paint his product a neutral color that will go with nearly everything. Unfortunately, such a neutral color also lacks distinctiveness. Were four color schemes determined, each design to fit within a specific quanta, and were products using them sold in their proper quanta environments, the consumer could buy any product with the knowledge that it would harmonize with his home. Then more distinctive colors would be entirely practical, with greater resultant sales stimulation.

Since Quantacolor in application is very young, it is likely that it will be quite a few years before it is widely adopted as a means of integrating color merchandising throughout the United States. However, nearly all consumers do prefer color harmony, and chemists are continually widening the range of available colors in many materials. This combination of demand and supply will soon necessitate some simple form of color integration in merchandising.

Many systems have been designed for better color integration in merchandising—all of them with individual merit.* The problem from the consumer point of view is that no widely recognized, easily understood color standards have been accepted by industry as a whole, and until this is done color merchandising will be at best hit or miss. For example, we have standards in the thread on nuts and bolts and the potency of vitamins. These standards have aided merchandising in the building of consumer acceptance and have simplified manufacture and inventory. We can anticipate similar economies and advantages when color has been standardized as applied to mass production and merchandising. Standards have always been one of the foundation stones of industry.

Color standards will aid color merchandising but they can never substitute for consumer research in color preferences or good taste in color selections. These will always be the contribution of the talented artist.

* Quantacolor Associates, 10 Rockefeller Plaza, New York. Carpet Institute, Inc., 350 Fifth Avenue, New York. Grand Rapids Furniture Guild, Grand Rapids, Michigan.

Light – Primary Medium of Design

Light is one of the most versatile media of esthetic expression in the hands of the talented industrial designer. While a well-designed product should appeal to *all five* human senses, it is the sense of vision that carries the primary interest in stimulating sales appeal. Because science and engineering have given us a tremendous *variety of light sources and almost infinite control and variation of these sources,* we have a medium of wide scope and complexity.

Too often lighting is considered only as a problem of locating ceiling fixtures and choosing lamps of the right wattage to give a desired intensity of illumination. Such information is easily gathered from an engineering handbook. Many installations have been made on this textbook basis which have resulted not only in very unattractive interiors, but also complaints of eye-strain, tiredness and neurosis.

Engineers are beginning to realize that *light is a psychological phenomenon as well as a physical one.* Light influences our emotions—our moods. In any new application of lighting, careful thought should be given to the desired mood that the environment is to convey to its occupants. In a store a mood of expectation and stimulation is needed and the lighting should never compete with the merchandise for interest. It should be remembered that shopping is a pleasure, not a task. A woman should *look forward* to every kind of buying with pleasure, whether the purchase is a new hat or hair-do or the family groceries. Interior color and lighting can produce these pleasant buying moods. Thus as an aid to merchandising lighting is an important medium.

In a restaurant we use illuminating intensities which make food seem more attractive and the environment seem quiet and subdued. Food is not enjoyed under high pressure and the lighting should not be too stimulating. On the other hand dining out is generally a festive affair and therefore restaurant lighting should not be subdued to the point of being uninteresting or sombre.

Good lighting, like any other composition, demands adherence to the basic laws of art and design. For example, using only indirect lighting results in a room that is extremely monotonous because there are no crisp high-lights or deep shadows. There is monotony in an unvaried scale of intensity. An interesting interior is one in which lighting intensities run through a wide gamut providing a range of contrast, and, hence, variety and interest. The greater the range, the more heightened the interest and stimulation. Thus, a store interior should have a wide range of scale stimulating impulse buying, and a restaurant should have a relatively low range of scale providing relaxation and directing attention to the subtleties of dining.

An office interior should have a relatively low range of scale to prevent eye fatigue which results from the eyes' effort to adjust to wide variations of lumen intensity. On the other hand, it would be impossible to work in an office lighted only by indirect illumination. This severe monotony would result in eye-strain and lack of interest in one's work and surroundings. Therefore, we see that the primary question in applying light to a given product or interior – indeed, in any application – is first to ask, "What mood or frame of mind do we want the user of this equipment or this environment to be in?" We then use colors and lighting intensities and designs to induce such a mood. The designer is thus in a position to stimulate happiness, elation, calmness, enthusiasm or efficiency, indeed all the various human feelings and emotions, by a judicious use of lighting.

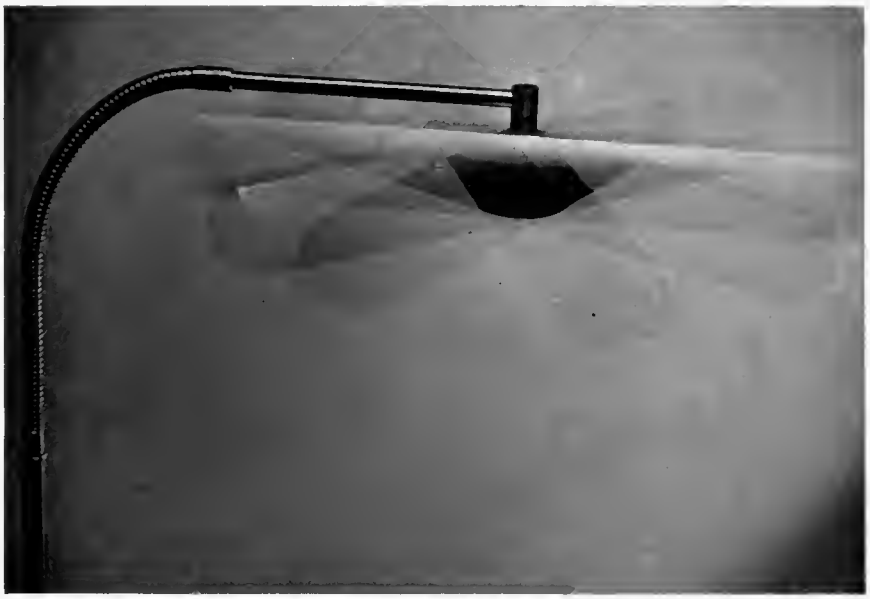
For too many years lighting fixtures have imitated illuminated candles or have appeared as ugly blobs of light on our walls and ceilings. Modern lighting fixtures add grace and charm to a room, while being efficient and subdued, and they need cost no more than the older atrocities.

Walter P. Margulies, Hotel Statler

Lighting can also increase the scale or apparent size of a room. Light is a three-dimensional thing. It is one of the strongest media an architect has to increase a sense of space and a sense of well-being. Take an interior, no matter how skillfully designed and decorated; add poor lighting and the result is discouragement. *This is because light is life itself.* Light is the dispeller of one of mankind's greatest inherent fears – the fear of darkness, of the unknown. It is easy to understand why many races have been sun worshippers, and to recognize a basic instinctive reason which causes all mankind to be emotionally influenced by light. Therefore, a study of the *psychology* of light and color is far more important to the successful application of light than a knowledge of lighting fixtures or lamp sizes. Once we have determined the desired effect we wish to create with our lighting, the application of the light source itself is a relatively simple one.

American lamp manufacturers are beginning to realize these basic points. Fluorescent lighting had tremendous acceptance in this country until women realized it was most uncomplimentary to the average feminine complexion. Now no woman wants to be seen in a room illuminated by fluorescent tubes. This is because it casts a monotonous white light unflattering to her make-up—particularly so if she is used to the warmer tones of incandescent light which are far more complimentary. The primary reason why fluorescent lighting has never been accepted in the American home, except in the kitchen, is because of the cold color of the light source. Lamp manufacturers, realizing this fact, have now experimented with new fluorescent colors, and soon there will be new lamps on the market far better suited to the emotional needs of the average user. Finding a color that is esthetically satisfying to the American woman will open up a tremendous new market for the fluorescent lighting industry in the American home. Lamp manufacturers must realize they are not merely selling glass lamps. *They are selling light*—a means toward making life more livable, more pleasant and more interesting. Thus sales and merchandising efforts should always be beamed toward the emotional and the psychological, rather than a functional or intellectual, appeal.

Our knowledge of good lighting has grown tremendously during the war, not only in the development of new light sources and fixtures but also in principles of application. We have discovered that high levels of brightness produce less fatigue on assembly lines than had ever before been considered possible. *Research shows that we can do our work more pleasantly and with far less effort where lighting intensities are high.* Many plants



Above all, light as a medium is flexible and capable of almost infinite control. Modern fixtures should demonstrate this versatility for maximum usefulness.

are performing assembly operations using 1000 foot candles and find that the costly installation of added fixtures more than pays for itself in increased efficiency.

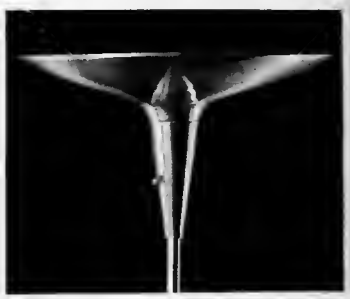
Modern stores now under construction are all using far higher levels of illumination intensities than ever before. Certainly a good principle in merchandising is to make seeing inviting and effortless. We see all things because of contrast in color and value. Contrast, however, must never be so great that the eye cannot comfortably take in the whole scene without shock. Reading a book in your office may have caused your eyes to become adjusted to a surface brightness of 20 foot candles. If you suddenly look out the window at the sky which may be 5000 foot candles you will experience an immediate sensation of discomfort and you call it *glare*. The same is true of interior lighting when there is too great contrast between highlights and shadows. The ideal interior for merchandising has a high overall intensity of lighting throughout, with no dim corners and no black shadows. In addition it has concentrated direct light where needed to spotlight specific merchandise for greater interest. It is difficult to design store lighting that is stimulating to the shopper and not over-stimulating to the employees who must work eight hours a day in the same environment, but it can be done.

Lighting techniques in factories, stores and theatres are far ahead of the average American home. If the average assembly line worker had to operate under the same lighting conditions that the president of the corporation has at home, his efficiency would be tremendously impaired. In the past 50 years home lighting has done little more than substitute electric lamps in fixtures and in locations where once were candles or gas jets.

The average American home of $8000 spends only about $250 on wiring and lighting fixtures. No other investment gives so much for so little. The lamp and fixture industry should base its growth on this fact. Consumer education in *good* lighting and improved fixture design could double the wiring and lighting expenditure in new homes. With the present market of 10,000,000 new homes in the offing, this becomes big business—and it will give the consumer something far better and more livable for a relatively small increased investment.

Note that selling this whole program to the American woman is based on emotion, eye-appeal and style.

Of all the five senses *vision* is the most precious and the most important in merchandising. Let us remember that *light* is the means of visual stimulation. At no point is good lighting more important than in merchandising at the point of sale. For this reason we may expect greater intensities of light and more flexible applications of light in the near future. *The best application of good lighting is where seeing is interesting and yet effortless, with light sources unobtrusive.*



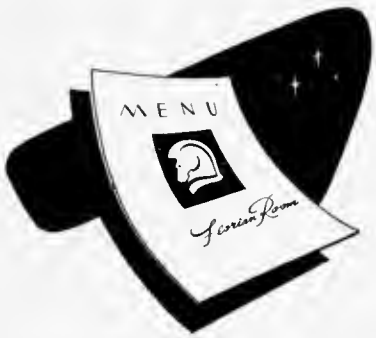
J. Gordon Lippincott, designer. General Electric Co.

Many commercial installations require fluorescent light for general illumination and incandescent light for high intensity flood lighting. The two can be combined to provide a low cost fixture. Perhaps the most interesting development today is cold cathode lighting, where an entire ceiling can be illuminated and no lighting fixtures appear at all.

Design Integration

Satisfaction is the pleasant summation of many little things, and the consumer continues to buy a product or service only because he is satisfied, or can find nothing else better. Design integration means the analysis and planning for *all* phases of business where applied art and psychology can increase consumer acceptance and satisfaction.

People seldom analyze their environment — they either like it or they do not like it. Your impression of a hotel lobby, for example, is favorable or the reverse dependent on many factors — most of them little things. Is the color pleasant, interesting and different? Is it quiet? Are the attendants' uniforms smart, their manners friendly? Is the lighting ample, and yet flattering? The right solutions of all factors, even those involving the smallest detail, are important because disturbing little details can spoil an ensemble. It is like wearing a fifty cent tie with a one hundred dollar suit — the eye is immediately drawn to the defects. Another analogy is that it takes only one discordant piccolo to spoil a symphony, *and even the unskilled ear registers displeasure.*



Design integration for a hotel means that every phase of interior design and service is carefully studied to be in harmony with a common motif—the individual personality of that hotel. Good design means the careful study of detail—all must be well solved in order to present an ensemble that is pleasing and distinctive.

In applying design integration to a product or service we consider everything the customer, the dealer or the employee sees. All must have a common character and distinctiveness. There should be immediate identification, whether you see an advertisement, the product itself, or a shipping label. For example, a passenger on an airline or a train should never confuse one line with another. All equipment, attendants' uniforms, stations, ticket booths, interior designs and advertising should hold together. *This is design integration.* It is important because it backs up advertising with memory value and meaning.

Design integration starts with a plan, and its guidance must come from the top. It means that all capital investment seen by the consumer is purchased with a common design specification. Planning this kind of an operation over the years will not only result in greater consumer identification and higher employee morale, but it also can protect capital investment against too rapid style obsolescence. A package, a trade mark, or a railroad station that is well planned and coordinated with the whole in the first place will last longer before requiring change. The right color paint costs no more per gallon than the wrong color. The right flooring material or fabrics are seldom more costly than those picked without taste or without a plan.

Far too many companies have "just grown" like Topsy, as far as visual design is concerned. Consider the history of a petroleum company which started with a few gasoline stations. With all the headaches of a new enterprise, packaging and station design were done without expert guidance — after all it did not cost much to repaint three stations. Now forty years later, this company is one of the largest in the United States, and yet most of its trade marks, colors, and symbols of consumer identification are still being used. Any change in something as simple as a road sign may cost several million dollars! Design integration during the formative years of this company would be a major asset today, now that competition is forcing improvement. This story is typical of many of our leading corporations, and a younger business with a future should bear this in mind in all its basic planning. *Design integration means planning for growth!*

Color standardization is a most important means of achieving design integration. Color standards should be set up for all packaging, interiors, equipment, booklets, uniforms — indeed every item that is seen by employes or consumers. To prevent a needlessly high inventory in paint and materials, the number of colors should be kept at a minimum. With an operation as large as an airline or a railroad, where paint must be applied to many thousands of pieces of equipment across an entire continent, the establishment of color standards and specifications becomes very important. The consumer should associate equipment with the company, whether he sees it in Seattle or Miami. Local painters should be able to buy specified colors and use them without mixing. Once color standards have been set up and the styling of all paint jobs delineated, the upkeep of a design integration program becomes normal routine.

Accountants deal with dollars and cents — down-to-earth tangibles. Yet in evaluating a going enterprise even the accountant sets aside very considerable estimates for "good will". After all what is good will? It is the factor behind repeat sales based on satisfaction. It is business momentum based on buying habits stimulated by advertising. It is largely predicated on memory, and above all, design integration stimulates memory.

Design integration also stimulates *personality* in a product or service. It can emphasize *character and quality*. These things are not tangible for any given moment, but when carefully planned and built over a period of years, they can become the very heart and major asset of a business. People remember visual impressions longer than names or sounds. *Design integration means the coordination of all visual elements of a business toward a common identity and purpose.*

Style Can Build Industries

Many sections of this country, with new war-built industrial plants or with ailing old enterprises, can profitably study how style — supported by consumer research — can build industries.

Examples abound to encourage those with initiative and imagination. Take the clothing industry. For many years, Paris was the world's fashion center, and the genius of a few designers gave life and vitality to the entire French textile industry. With the coming of World War II, New York City took the fashion leadership that Paris was forced to relinquish. But not without a challenge. Hollywood and Dallas, Texas, aggressively seek a place in the field. Los Angeles has, in fact, become a national center for the manufacture of sports clothes — *an industry based wholly on creative and imaginative designing*. Today the garment industry is a billion-and-a-half dollar enterprise whose chief basis is rapid style obsolescence.

Right now the West Coast has a unique opportunity within its grasp if its leaders have the vision to nurture and develop it. For the first time in its history because of war expansion it has a vast and well integrated industry for the production of consumer goods. To aid its growth, it has a moderate supply of that most basic of all metals — steel, and is now in a position to go into the manufacture of complete lines of nearly all consumer goods. Los Angeles is approaching Detroit as a city of mass production.

The heart of the West Coast opportunity lies in style leadership. Its manufacturers should not be satisfied merely with meeting the competition of Eastern manufacturers for home consumption, because after all they have a market of only 16,000,000. Through superior style, they can actually compete with the Eastern manufacturers *in the East* as well on the West Coast. After all, the West is younger and more aggressive. Some of its creative designers have demonstrated style leadership in clothing, and their contemporaries now have the opportunity to demonstrate style leadership in product development.

California's great clothing industry has been built on style leadership and imagination. The same opportunity is open to other communities whose industries demonstrate creative thinking and enterprise. Style can build industries.

In architecture, the West Coast is definitely ahead of all the rest of the country. Its super-markets are far superior to anything on the East Coast or the Middle West. Indeed, much of the concept of super-market merchandising was born in the far West. There less tradition hampers progress and far less obsolete capital investment has to be liquidated. West Coast leaders need one major thing to put their brand new capital investment and "know how" into action, and that is the vision to capture public imagination. If products on the West Coast — common, everyday things like radios, refrigerators, vacuum cleaners, cosmetics and the like — were designed *better* than in the East and Midwest, California could in a short time acquire and develop the reputation for having better products. This reputation, supported by good public relations, could be a prime means of stimulating a new and growing California industry.

California has developed an architecture of its own for the home that is a comfortable and livable modern style. While it is perhaps a bit early to tell now, I feel that the California ranch house is the next great American style after our Colonial. The California home has low pitched roofs, all rooms on one floor, and windows to bring the outdoors within. These homes are now appearing widely all over the United States because they are modern, well-planned and livable. *What California has done in style leadership in architecture can be done in industry if she has the foresight and initiative to do it.*

William Wilson Wurster, Architect

California has also demonstrated style leadership in architecture—perhaps due to her more equitable climate, but even more likely due to her youth and freedom from tradition. These homes are not costly—rather they demonstrate ingenuity and good taste in the treatment of relatively inexpensive materials.

I have described California's opportunity simply because it seems to me to be unique and tremendous. Yet in some ways every manufacturing town in the United States has the same opportunity. Take those small Connecticut towns that specialize in hardware. The hardware industry has been dormant for many years; no company, in fact, has a truly complete and functional line of modern hardware. If any community were to bring out such a line, based on creative thinking backed by consumer research, improve it year after year, and wrap a glamorous story around it, that community could build a reputation that would have lasting and tangible value.

Many industries are springing up in the South. Among them are several furniture plants whose operators should not miss the lesson taught by Chippendale. His name adds value to furniture because it characterizes a distinctive style. Many a young company — perhaps one starting out in the South today — can be assured of success if it has the initiative to produce a line of truly functional, low-cost modern furniture, which should be accompanied by adequately-planned, built-in furniture and storage units.

Style must be considered a part of research. In its development, both consumer as well as industrial research must be considered. And note well here that our larger corporations have proven beyond doubt that research pays dividends.

The chemical industry before the war was spending 3.4% of its dollar sales on research, and this investment has been reflected in its rapid growth.

Richard J. Neutra, Architect

Only as youthful a people as the Californians could be so generous in planning for space and the wide use of glass. They have successfully demonstrated how to create simple organic structures for good living.

Richard J. Neutra, Architect

Perhaps the outstanding contribution of the California designer is that he has shown us how to live—in the clothes he wears and the home he lives in. He now has the opportunity to apply the same creative thinking to all other forms of mass production. If he does, new industries will be born.

This is sixteen times the amount spent for research by the average of all other industries! Obviously other industries have the same opportunities for growth, and the trend is already under way. Many of our larger corporations are setting up product development and styling laboratories on a large scale which is very tangible proof of their conviction of the soundness of research.

A recent national survey showed that in allocating funds for research, industry as a whole before the war was spending $75 for industrial research for every $1 of consumer research! These figures are almost unbelievable. They show that we are spending tremendous effort in increasing our "know how" in mass production, without giving adequate thought to mass distribution and consumer desires. It also points out a unique opportunity for the thoughtful manufacturer — *to increase the proportionate expenditure on consumer research in the highly competitive era ahead and move more merchandise.* During highly competitive periods, money is made in *moving* merchandise, not in merely *manufacturing* it. Many a company has seen a sales manager earn more than the president! Allocating funds for styling means expanding consumer research, and based on the above figures it makes common sense.

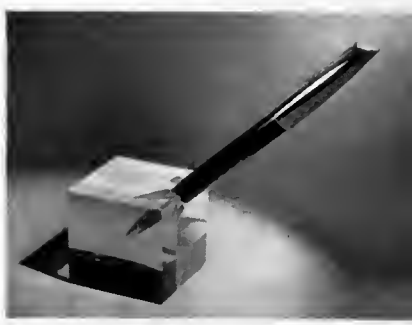
Style can build industries because it is the basis of distinctive products and services, and where the consumer has a choice in buying, the sale of the distinctive product GROWS.

Trend Toward Simplicity

The march of progress, like happier living, is toward simplicity. And simplicity, too, is the highest goal of any talented engineer or designer.

The pattern of evolution of any new development is generally from a simple beginning and a simple concept, through greater development, ramification and magnification, to extreme complexity. Then, after the complexity has become completely overbearing, some new and simple concept is born *which makes obsolete the initial concept.* The new jet-propelled engine is an excellent example of skill in this direction — a refreshingly simple mechanism that eliminates the many precision parts of the internal combustion engine.

The average, large American city is another excellent illustration. During the 1890's, wholesale investment in electric street railways, elevated railway structures and subways replaced the less efficient but far simpler horse-cars. These new railways, elevateds and subways added complexity to city life. Their bonded costs raised taxes on properties, which in turn made necessary the building of tall and expensive buildings, whose rents would provide these taxes. To service these buildings properly, costly investments in sewage disposal, water, electricity and other public utilities were essential. Tall buildings required great investments in elevators, vertical plumbing and more costly foundations. Our early American cities, based on simplicity, gradually became more and more complex. Our city streets were not designed for modern automobiles, and continual traffic jams are the result. Motor fumes, smoke and dust make city air unhealthy and help to increase respiratory diseases — products of our so-called modern civilization.



Where are tomorrow's cities? What great new simplification can we anticipate that will make obsolete the city of today? Strangely enough, tomorrow's cities will be more nearly like our earlier cities, in that they will have no street cars, fewer automobiles, and probably no skyscrapers. This means they will not have the tremendous capital investment present in most of our complex city centers of today. These capital investments make it difficult, if indeed possible, for cities like New York to become modernized.

Tomorrow's cities will be like some cities in Texas, Central and South America, whose *location* gives them enough land on which to spread. Their entire planning and growth will be based on communication by air. Air travel is already widely accepted in these new places. It is not an uncommon sight in Tegucigalpa, Honduras, to see Indians climbing on board a plane to fly only as far as the next town. The mountains are virtually impassable, so highway transportation as we know it has always proved tremendously costly. For that reason, much of Central America is skipping our era of railroad and automotive transport and is going directly into the era of air travel. Many of these cities, therefore, will inherit none of the outmoded investments common to our larger American cities. They will start in the new era from scratch — an era based on simplicity.

This simplicity is apparent when one visualizes that some of our larger aircraft can carry as many passengers between New York and Los Angeles as an entire Pullman train, because the plane can make eight trips while the train is making one. The plane only requires an airport at each end — each simpler than a rail terminal — and in further comparison the train must traverse thousands of miles over costly road bed. You will say that planes cannot carry freight as cheaply as the railroads and this is true. Indeed it may always be true, although one would be rash to make such a statement. This demonstrates that new simple developments do not always *replace* the older and more complex ones, but *augment* them and at the same time widen the field of human activity.

The history of the recorded word also illustrates how simplicity runs in cycles. Early books and manuscripts were written entirely by hand. Hand-operated presses increased production. Power, applied to still larger presses, upped output still more. Anyone who has visited the printing plant of a large newspaper marvels at the complexity of a machine that can print over 100,000 copies in a matter of minutes. The distribution of the recorded word has grown in concept and in complexity until books, magazines and the printed word are so cheap that no one can possibly *store* all the printed matter he receives, let alone read it.

Then suddenly, after complexity has reached a point where human advancement demands simplicity, new concepts are born. News, for example, spreads by the radio, short-cutting the complexity of great printing presses and paper. During the war hundreds of millions of people received vital news in a matter of minutes, despite the fact that it came from the outermost corners of the earth, and that listeners were on all the continents and seven seas. The task of printing this news and distributing it as rapidly on paper would be impossible. Through the application of the radio, it was relatively simple.

J. Gordon Lippincott, Designer. L. E. Waterman Co.

The trend in all product development has been toward simplicity in appearance as well as function. These three models demonstrate this trend in fountain pen design.

For many centuries current events and history have been passed on by word of mouth — the epitome of simplicity, if not of accuracy. The written word added accuracy to the record. Now we are going back to the original simplicity *plus* accuracy, because of the radio and electronic recording of speech. Books that read out loud are not far off. The typewriter is being short circuited in many modern business offices with recordings on plastic discs that may be mailed or filed. We are leaving the printed word and returning to the simplicity of speech!

The radio, however, while very simple in its early days, has become increasingly complex. Television is complicating broadcasting still further. The average citizen was happy before the war with a relatively inexpensive radio set. It may not have given him all he could have asked for in fidelity, but it represented the greatest value for a given investment in entertainment history. Can the increased complexity of television do as much for him? Is he prepared to pay the greatly increased repair costs that will most assuredly be his because of the greater complexity of these new sets? Is the radio industry ready for the tremendous investment television will demand? We see radio going through the same rapid expansion and complication that the printing industry experienced during the last generation. How will it end? Someone will discover the means to do these things in a far simpler manner. Then billions of dollars invested in our present means of communications will be obsolete. Let us hope the directors of the radio industries have planned for change.

Simplicity in product design has always been a prime objective with designers. If it is possible to make a vacuum cleaner housing out of two pieces instead of a customary five, then we make it of two pieces. Later on we may discover that if we can eliminate rugs from our floors, we need no vacuum cleaner at all—and so the march toward simplicity goes!*

*Panel heating in floors makes this possible.

J. Gordon Lippincott, designer, Multistamp Co.

Simplicity goes more than skin-deep, and in this engineering cannot be separated from styling in the development of a better product. The improved model of this stamping device has cut the number of parts in half, lowered production costs, and improved operation. It is a typical example of product development where simplicity is the primary goal.

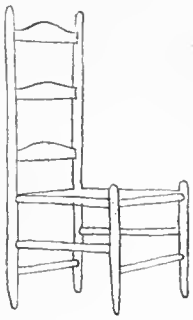
The simplifying of all means of mass distribution is required to bring the fruits of mass production to *all* American consumers. The chain store has in a sense simplified mass distribution and, as a result, has prospered. The merchandising of frozen foods is a far simpler means of selling vegetables, fish and meat to the consumer than older methods of shipping them in bulk, involving larger shipments, greater weight and waste. For example, we are headed into an era when meat will be sold in packaged and wholly edible units, rather than by shipping whole carcasses to be cut up wastefully by the local butcher. Meat will be specifically graded, and consumer confidence will be established. Packaged foods will be cheaper than those available now because of savings achieved in marketing— in part because of simplicity of distribution and in part through elimination of waste.

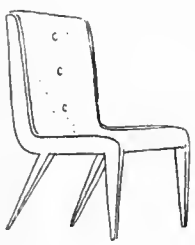
One of the primary reasons for the present complexity of our national existence is that we have taken the tremendous productivity of the machine tool and applied it to habits of living based on older concepts. Most of our legal decisions are based on precedent, and the greatly increased tempo of modern life has left us in a major legal dilemma. We even have laws preventing simplification — for example, court records could be far more simply and cheaply recorded through electronic transcribing devices, and yet they must still be laboriously taken down by hand, set in type and entered in records in readable form.

As a nation, we have just about reached the peak of complexity. Our federal government has grown so complex that simplification and integration now emerges as an outstanding national need. Life is so complex that the average American seeks escape in soap operas on his radio, detective stories, movies, or merely the age-old medium of getting drunk. The true means of really enjoying the tremendous fruits of mass production in the coming era is through the greater application of simplicity in all phases of American life.

Simplification and integration are the primary basis of modern design. To demonstrate the actual application of this thinking, consider an ordinary chair. The chair is traditionally made up of four legs, a seat, a back, arms and stringers to strengthen the legs. In designing a modern chair the industrial designer asks himself: "How can I simplify this traditional design—what parts can I eliminate due to modern construction, what other elements can I integrate or combine to simplify appearance or construction?"

Modern adhesives have now been developed to a point where a wood joint may be as strong as the material it binds together; and this has largely





eliminated the need for stringers between the legs. The elimination of stringers has decreased the weight and enhanced the beauty of modern furniture. To achieve greater simplicity many modern chairs are made with back and seat integrally in one piece. The important thing to note in all these sketches is that appearance is simplified and comfort increased. Visually, the number of elements in the design has been reduced, and this trend toward simplification and integration is the basis of good modern design.

Carrying this thinking to its ultimate conclusion one might ask — why have a chair at all? Our oriental contemporaries do not use chairs and as a result their rooms seem far more spacious and less cluttered. If we Americans could accustom ourselves to the habit of taking our tea crosslegged on the floor, we would eliminate one more object to rub furniture polish on. By this I do not mean that the elimination of chairs would make our daily living easier or more pleasant. It is simply that we have reached such a degree of complexity in our lives that we can well afford to ask of nearly everything we use, "Is this object really necessary; does it really make living easier, more gracious and pleasant or is it adding to the complexity of daily existence?"

If you were to ask this question about the numerous things in your home you would be surprised at the number of things that require cleaning, dusting and care that are practically never used. Fancy and fragile chinaware that catches dust in an ornate glass-front cabinet and is used only when extra-special company arrives, is typical of things that are so "beautiful" that we hesitate to throw them away and hence allow them to clutter up our lives year after year. The industrial designer is playing a key role in shaping tomorrow's world. He is unhampered by tradition and eternally asks *why* we do things the way we do. While his primary object and his reason for being is to stimulate wider sales of consumer goods, he has also the deeper objective of making life fuller and richer for all of us.

No great inventions are needed to put us in an era of prosperity beyond our fondest dreams. We have the production facilities, the natural resources, the "know how" and the manpower. The essential factors are the quality of our thought and vision of our leaders. Industrial design fits into this new scheme of things because it is far more than applied art — it is a *concept of living*. The industrial designer is in accord with all these things because he is firmly convinced that we are entering an age when, because of science and the machine, a greater proportion of our population may live in health, happiness and security than has ever before been possible. The attainment of this security depends largely upon a *state of mind* — a conviction that we have this opportunity and that we can achieve it. Note too that this achievement is entirely based on the *desire of the American consumer himself* — a desire for ownership of all the many fruits of mass production, a desire that is ever stimulated through research in providing better and still better products.

Design Patent Protection

A design patent is worth little more than the paper it is printed on, except perhaps for a doubtful degree of scare value. Design patents can in no way be compared with the protection afforded by a sound mechanical patent. All this is unfortunate but true. Pirating of the most flagrant sort has been common practice in the textile industry, and yet under existing patent laws nothing can be done about it. It is a situation that all industry must shortly take very seriously because as applied art has increased in tangible value such pirating becomes increasingly costly.

The situation arises from the fact that we have no esthetic yardstick — no means precisely to define and classify art creations. Unlike mechanical devices that may be minutely illustrated and described, style has no such precise delineation. The root of the trouble lies deep in our national history. In the early days of this country when the Patent Office was just commencing its work, no one could foresee the sweeping economic value of applied art, and no one thought to provide the means to protect and compensate for it. We have adequate copyright laws to protect a writer, and patent laws to protect the engineer, but adequate laws that protect applied art, design and style are all but non-existent.

I know of a glass company which brought out a new line of hand-made glassware based on a leaf motif. The line was fresh, new and excellent and sales soared. Six months later a far larger glass company brought out near-copies and went into high mass production, cutting the retail price almost in half, and the sales of the smaller company dropped sharply. They sued the larger company for damages, on the ground that their design had been copied and they had provable economic loss in the reduction of their business. While the copy was not an exact duplicate, it was so close that the average consumer could mistake one for the other when two of them were placed side by side on a retail counter.

After a long and costly suit, the company whose design had been pirated lost! They lost on the grounds that a leaf motif was not a new design and hence was available for everyone's use.

Even more flagrant examples of pirating are common in the textile industry. When smart new fabrics are brought out, copies are made by fly-by-night operators who have duplicates on the market only a few days later, in far poorer quality and at much lower prices. Most manufacturers who own design patents should entertain little hope as to their value if the decision ultimately comes before our courts. We simply do not have the legal mechanism for protecting applied arts!

The manufacturer therefore is faced with two alternatives. He may either cease to spend time, money and ingenuity in developing new and smart styling when he knows it is going to be copied or he can take the more aggressive policy of rapid style-obsolescence by bringing out new designs so often that the pirate is always in the rear. The old principle of "Get there fustest with the mostest" still holds true.

The high tooling costs of many products – refrigerators, radios, automobiles for example – are such that it does not pay legitimate manufacturers to copy their styling since tooling costs are usually considerably greater than styling costs. *Indeed high tooling costs are the best means of design protection,* since disreputable competition usually cannot afford these heavy investments.

This protection is, however, at best a makeshift. When industry begins to invest sums in design research, comparable with those it is now investing in engineering research, it will realize that pirating of design is costly and will make a concerted effort to revise obsolete patent laws. The present steps being taken by the Department of Commerce in its intensive study to strengthen our patent system is a step in the right direction.

The Need For Industrial Design Education

Department of Industrial Design, Pratt Institute

A chapter on industrial design education may seem out of place in a book written primarily for the American business man, but *sound education is long-range planning.* Corporations are kept alive only by the continuous addition of new, young, and talented man power. Our engineering and business schools are serving this function adequately and, toward this end, are generously supported by industry.

Several of our largest corporations have set up very costly laboratories for product styling. This is tangible evidence of their conviction that investment in design pays dividends. But how are they going to man these laboratories? Filling the drafting tables with commercial artists, engineers and architects is not the answer. *Mere numbers do not produce creative, vital, fresh styling in a highly specialized profession.*

Some of our larger industries have run cadet training programs for talented engineering graduates with a high degree of success. The same technique will have to be followed with industrial design, but, to start such a program, talented young graduates with sound basic backgrounds must be available.

Let us see what our colleges and universities are doing in meeting the needs of this new profession. There are about six schools turning out industrial design graduates at this time, and most of these cannot be compared in calibre with the graduates in other established professions. Some other schools give courses called industrial design but at best they do little more than give lip service to the art.

There are many reasons why industrial design is not being taught adequately today. First and foremost, there are very few teachers who have *practiced* as well as *taught* industrial design. This is a living applied art and it cannot be taught from text books (of which there are none) or like an academic subject. Most designers who are talented and experienced enough to teach are earning more than many college presidents by working for industry. Some means must be found to encourage their teaching.

The profession of industrial design is also so young that it has not crystallized. It has not reached the stature of a profession like civil engineering or architecture. Anyone can hang out a shingle, call himself an industrial designer, and solicit business. In the few schools teaching industrial design, there is no mutual accord as to curriculum. *Indeed, neither our universities nor our associations of practicing industrial designers have agreed on the scope of the profession or the qualifications for its practice.* With all this indecision as to the basic nature of industrial design there is little wonder that our schools are not turning out graduates adequately

J. J. Augustin, Inc.

Creativeness is inherent in man and has been demonstrated throughout all recorded history. Art sensitivity and appreciation must be nurtured and stimulated. This can add to the enjoyment of modern life — which has so far demonstrated a greater ability to produce well than to use well. Art education will play an important part in the growing maturity of our people.

suited to the needs of industry or aware of the responsibilities and importance of their chosen profession. In short, as with most new developments, the profession of industrial design is experiencing growing pains.

These growing pains hurt industry because there are far more people calling themselves industrial designers than merit the title and their failures are costly to their employers. The growing pains hurt our universities because they are being asked by student bodies to start courses in industrial design without knowing the essentials of a curriculum or where to find a faculty. Meanwhile all industry recognizes the economic value of styling and is asking for talent. There must be some solution.

We must define the *scope of the profession* and that has been one of the functions of this book. Realizing the highly specialized nature of industrial design and the keen responsibilities thereof means two things: *First,* industrial design cannot be taught adequately in two or three undergraduate years. It is too highly skilled and specialized. The very minimum requires a full four-year program leading to a degree. *Second,* this country will never need as many industrial designers as it needs lawyers, mechanical engineers or architects. There are about 20 firms of industrial design consultants employing five or more designers in the United States today, making a grand total of perhaps 500 designers. There are another 500 or so industrial designers free-lancing or practicing within industry itself – giving, as a rough estimate, a grand total of about 1000 people in this country who, by the longest stretch of the imagination, can call themselves industrial designers. And yet, this small group is largely responsible for the styling of *many billions of dollars* worth of consumer goods yearly.

Pratt Institute

Industrial students must gain an appreciation for form, structure, and materials through the actual creation of their designs. Design education is costly because it demands the best in equipment—a reason why support from industry is essential for growth.

This means that most colleges and universities should *not* teach industrial design. *A dozen top-notch schools could supply industry with all the talented designers they need for the foreseeable future.* A few schools with truly fine faculties and equipment will serve industry and their students far better than widely scattered courses of a hit-or-miss nature.

Educators often ask me whether courses in industrial design should be in the school of Architecture, Fine Arts, or Engineering. The answer is that it doesn't matter which one of these departments encompasses industrial design, providing it has a balanced well-taught curriculum. The industrial designer requires four basic elements in his training:

1. *Art.* He must understand and have an appreciation for the basic elements, principles and attributes of visual design. He must have a cultured background in the arts of past eras, an appreciation of the history of art and creative ideas. He must be able to draw and express these creative ideas on paper and in clay. Of all qualities, the industrial designer must have art — without this, he is not a designer.

2. *Engineering.* A basic knowledge of the tools and methods of mass production are essential to the styling of a product that can be manufactured at a competitive price. Obviously, no collegiate course in industrial design can teach a student enough to cover the tremendously broad field of mass production — everything from lipsticks to locomotives. The best groundwork for engineering appreciation, however, is physics — which should be a part of every sound industrial design curriculum. In addition, the designer should have the opportunity of working on all basic machine tools plus ample field trips to industry. He should know basic operations and production methods. These should not be taught in the manner that is conventionally used in engineering schools. There is no need for the industrial designer, for example, to have mathematical training beyond high school. Most of his designing is empirical. What he must have is a good "feel" for common sense design and an understanding of production limitations, so that he may talk intelligently with engineers with whom he works in the creation of a product.

3. *Economics.* Sales and merchandising methods in the distribution of goods is another element of the industrial designer's training. Packaging, for example, is an important phase of industrial design — one that is dependent on sound merchandising. If the designer is to work within our economic fabric, he must have an appreciation of business procedures. In designing any product, he will not only be working with the engineers but also with the sales staff, through whose experience he will always have a test of consumer acceptance.

Pratt Institute

The study of abstract is one of the most valuable elements in the designer's education. They stimulate his creativeness and cultivate his imagination.

Note the similarity in style of the abstraction to the left, to the electric drink-mixer below. Both were done in the 1930s when step-backed or laminated decorations were a popular style trend.

Modern education teaches a student to think while he creates. Using his hands gives him an appreciation of materials but only real mental discipline can teach him truly functional and practical design.

Here let me add that courses in public speaking, diction and the development of personality are vital to the training of the industrial designer who hopes to reach the top. In most plants, the industrial designer is expected to be a coordinator between the engineering, sales, and executive staffs. He must be able to stand before a meeting of the Board and present a project to a group of key executives. He must be able to approach these men on their own level, and most of them are college graduates. For this reason, his training should be at least as broad in cultural values as that of the average college graduate with whom he is doing business.

4. *Humanities.* The industrial designer essentially is an observer of people. He must know what products will sell, what people want to buy, how much they can afford to pay. Style is a living, changing thing. The styles that sell this year will not sell next year. To guide his client in the critical selection of a product that has consumer appeal, the industrial designer must be a keen observer of human habits and traits. For this reason, the curriculum offered by our colleges should go well beyond the applied arts. History, the encouragement of travel and an appreciation of the other arts and humanities are all essential in making up the well-rounded individual. Versatility in industrial design is a must. The successful industrial designer is an artist, engineer, diplomat, salesman and philosopher, all in one personality, and to be successful, he needs all these characteristics.

Industry knows it needs talented designers. It has recognized this need by paying them well. Now it should recognize that well-rounded young designers don't "just happen". They are the products of our educational system. When industry realizes this fact and contributes its "know how," as well as its wealth, in guiding industrial design education, a new and even more prolific era of design will be born.

How Do You Buy Industrial Design?

The present trend in using style as a means of moving merchandise is relatively new. In the days of our grandfathers, the demand for the simple products of daily living was so great that new industries were born with little research or planning. They were born because there was a tremendous *human need* for things that made living easier and better. Today the birth of new products and new industries can be achieved only through substantial expenditures in research plus advertising to create a demand.

For many years, management within industry has been production-conscious and banker-conscious. They have spent large sums to make something faster or cheaper, and they have often operated their businesses with an eye on financial statements that would be pleasing to Wall Street. There is a tendency today on the part of many older industries to continue operations in the manner of generations gone by — with the feeling that if it worked in the past it will work in the future.

Let us look at markets today. Industry and technology have gone through breath-taking expansion. As a whole, our population is not in acute need of many new things to make life easier — not as compared with a generation ago. New products and services require far greater investments in thought, planning and effort in order to be successful. *As the years go by, our older products and services find themselves operating at closer and closer profit margins. Opportunities for higher profits lie largely through the creation of new products and services.*

Thus, we now find ourselves in a situation where management must think in three terms — *production, banking* and *new products and services to assure continued growth.* High taxation is stimulating research as a yearly expenditure. Increased competition will further stimulate the ever greater growth of new products and improvement of older products. The executive who is not in tune with this trend may soon find himself heading a company that can make only low profits — sliding slowly but surely on a downhill grade. We are truly entering an era of tremendous expansion in research, and industrial design is playing an important part.

Nearly all top management recognizes these facts. The problem then is how to set up adequate facilities for research including Industrial Design. Research is unique in that ideas are precious — and the right idea is one in a hundred. A fresh point of view and true creativeness must be carefully nurtured. Mere man power alone is meaningless in research since two or three wrong ideas do not make one right idea. Therefore, research and product development are of necessity carried on by the talented few who are specialists in their field. This kind of personnel is difficult to find, and since research is creative, for best results *the researcher must be in a mental frame of mind that is favorable to intensive creativeness.*

Our larger corporations have had substantial laboratories in research and product development and more recently in styling. Indeed some of our automotive corporations have very impressive staffs devoted to product development and styling — even featuring them in their advertising — recognizing this as the very life-blood of their continued growth.

The problem then, is not only the recognition of the need for research and product development but also to determine what are reasonable sums to budget for this phase of operation and how to best spend the allocated funds. Before the war the chemical industry spent 3.4 per cent of its dollar sales in research and its phenomenal growth has been a direct result of this investment.

The mere allocation of funds for research does not necessarily assure results. *Funds for research and product development should not be under the direction of production engineering but should be spent within a self-contained nucleus directly responsible to top management.* Production's prime responsibility is in manufacture, and if product development is given to production as a secondary responsibility you can rest assured it will receive only secondary attention. Also it is of interest to production to see that new product changes are kept as minor as possible. No one likes to go through the headaches of setting up an assembly line for a new product only to find that it is necessary to do the whole process over again a year or two later. *Production engineering therefore is traditionally conservative in product development.*

Above all, industrial design and styling should not be under the direction of engineering — the place where it now is within most organizations. When engineering directs styling, the designers lose a great deal of their creativeness. This is no reflection on the talents of production engineers — it is simply that you can't assign a man two tasks that are very nearly opposite and expect him to come up with outstanding results on both assignments. Production engineering's job is to produce; the job of product development and styling is to create. Both are equally important to a successful business operation and both are full time jobs.

It goes without saying that a product development staff cannot go drifting off into the blue in the creation of a better product. They must be practical and ultimately must create something that can be manufactured within price and production limitation. However, if their primary goal is *creativeness* and if they are not hamstrung by limitations from a production staff who quite naturally prefer solutions that are easy to produce, the greatest results will follow.

The primary goal is to produce a product or service that is better than competition. When the research-product development team feels it has created a practical product ready for manufacture, the product is then given to production engineering whose job is to produce it within forecast costs. If this cannot be done, it is obvious that some compromises are necessary, but these compromises come at a stage where they are not handicapping creative thought and imaginative engineering.

One of the outstanding requirements of the industrial designer is *fresh, creative thinking.* This is difficult to keep within a large corporation. It is the main reason why many of our larger corporations who have talented industrial design staffs of their own still retain outside consultants as a check. The outside consultant works on so many varied problems that he sees with a fresh eye — his point of view is unbiased.

Industrial design must be considered as research, and like research it should be carried forward continuously. Considering the problem in this light, the manufacturer should not go to the consultant designer and say: "Here is my new mouse trap — what are you going to charge me to style it"? He should say, "I have a business selling so many millions of dollars worth of mouse traps a year. What proportion of my gross dollar sales should be allocated to research—industrial research making cheaper and better mouse traps and consumer research styling and developing mouse traps that people really want to buy?" He should allocate a yearly budget for research. Part of this budget should be spent within his own organization improving his own production techniques and his products. The other part should be spent with outside consultants in marketing, industrial design and other phases of consumer research to assure him of continuous favored competitive position.

Expenditures for styling have too often been considered as an afterthought rather than a planned allotment in a budget. Most manufacturers forecast budget expenditures for advertising. Industrial design costs but a small fraction of the average advertising budget for most products and services, and yet this expenditure often is a large part of the ammunition used in an advertising campaign. It does not make sense to spend a quarter of a million dollars a year in advertising a food product where the advertisements picture the package prominently, and then to go out and have the package redesigned for $2000. Yet many manufacturers today are doing exactly this! Manufacturers must never underestimate the responsibility they place in the designer they retain, or the amount of time, ingenuity and research needed to come up with something truly outstanding and better that they know will increase sales.

In buying industrial design, first convince yourself that style can help merchandise your product or service and then delineate the scope of the program. Retain an industrial designer whose past performance demonstrates his ability to work on your problems, and set up a budget that will enable him to work with you until he knows every important phase of your marketing, merchandising and manufacturing. Buying industrial design on the basis of an armful of pretty renderings for a few thousand dollars is money poorly spent, because the designs are not backed up by enough research, and the investment is too small in proportion to the sums that must later be spent in engineering, tooling, advertising and production *to assure the manufacturer of sales success.*

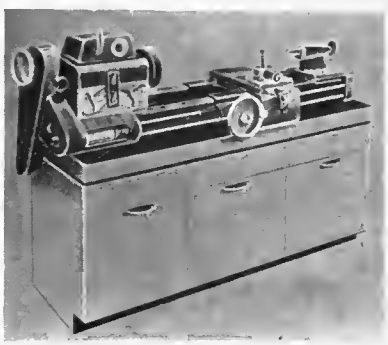
Although some phases of industrial design — vision and creativeness, for example — deal with intangibles, it is an activity that must be eminently practical because its conceptions ultimately must be engineered, tooled and made ready for mass production.

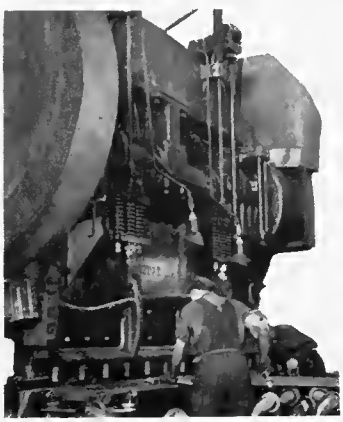
Obviously, there is no ready yardstick of creative talent. Comparison and results alone can provide an adequate basis of judgment. So, through the stages of product development, you as a manufacturer must buy design solely on the basis of confidence. Your confidence at this period must be built on your appraisal of a designer's personality and talent, on his experience and his record of satisfied clients and successful designs.

Yet there are some guides to aid selection and they can be presented as the answer to three critical questions.

1. *Can he assure me that my product will lead the market?*

There is but one reason for hiring an Industrial Designer — to increase sales and gain a greater financial return from a given capital investment. Style has actual tangible economic value. A well-styled dress can retail for $30.00





whereas a poorly styled dress of substantially the same material and workmanship may retail for as little as $10.00. Women, particularly, are used to paying more money for style. Your industrial designer, if he is alert to buying trends, can style your products for leadership in your field. However, he must be thoroughly practical in his approach. He must not substantially increase your manufacturing cost in designing a product improvement; indeed, he must aim to lower that manufacturing cost. Preferably, he should have on his staff engineers capable of complete understanding of all problems involved and able to carry the products through engineering as well as styling development . . . or at least capable of doing so in cooperation with your engineering staff.

No designer can *guarantee* that his design will lead the market, since no one knows what competition will bring out — and no organization has a monopoly on ingenuity. But a talented designer *can,* because it has been proven by precedent, assure that continued investment in research will keep a manufacturer in a favored position among the leaders of his competition. This much can be positively assured.

2. *How do you know he can do it?*

Your only criterion for confidence in the industrial designer and his ability is in his references. For whom has he designed in the past? Have his products been practical and successful? Who are his other clients? Has he an adequate staff ready for assignment to your project? Is he financially responsible? These are all tangibles, capable of analysis. Certainly you are not buying industrial design services on a basis of price alone, because guidance of this type is so doubtful that very large sums could be spent without satisfactory or workable results. The costs of industrial design are very small when distributed over high mass production; and therefore the objective should be complete confidence that your designer can achieve the desired results, and an intelligent budget should be planned accordingly.

3. *What does it cost?*

Industrial design costs are relative to sales. In actual practice, design costs vary from one-half of one percent to five percent of gross sales, depending on the volume, type of product and the complexity of the engineering and product development phases.

There are two accepted methods of retaining a designer. The first is on a monthly or yearly retainer fee plus an hourly charge for designers', engineers', draftsmen's and modelmakers' time. The retainer fee covers the time and personal attention of the head of the firm plus the talents of the research staff. If desired it also can assure you that your designer will work exclusively for your account within your field. On this basis of

operation, it is customary for the designer to forecast total costs so that an intelligent budget can be set up. In operation, this method has been widely accepted by many designers, and is a fair one to both the client and the designer.

The second method of retaining a designer is on a straight quotation basis. Here the designer agrees to perform a specified assignment for a given sum. Many clients prefer this method because they know in advance what the total costs will be. Where the project can be easily defined, this has proved successful.

The actual answer to the question — What does design cost? — is: Very little if successful; and far too much if the final product is a sales failure. That is why industrial design can be bought only on the basis of *confidence* in a designer's ability to produce successful results.

Once a manufacturer has selected an industrial designer, success depends on a careful delineation of the whole program, and a common understanding of objectives. After this has been agreed upon, it must be backed up with continual and close cooperation. No consultant designer can ever know as much about his client's business as the client does himself, and he would be foolishly conceited if he though he did. A manufacturer will get far more from his consultant designer if he and his staff will take the personal time required to go over all phases of product development during progress, providing continual cooperative guidance. In other words the client will get as much out as he puts in, and while this takes personal time and effort it is well worth it.

One of the greatest assets of the industrial design consultant is his fresh unbiased creative point of view. This is stimulation, and like all creative thinking it must of necessity include the impractical with the useful in the initial stages. No designer can always come up with the right solution the first time, and the process of critical selection, sifting and compromise that ultimately results in a new and practical product depends on cooperative effort.

There is nothing new in this formula. Many of our leading industrial designers have had the same clients year after year on a retainer basis, and they have done it by successfully applying these principles. Proof of its success is that these manufacturers have continued to retain their designers, and have continued to hold top positions in their competitive fields.

Art has economic value. It can develop through research in the same manner as the sciences. When skillfully applied to a product or service it can be merchandised at a handsome profit.

Trends Tomorrow

Since tomorrow's style trends often depend upon materials and techniques as yet uninvented or untried, long range style forecasting is difficult, if not impossible. The manufacturer who accurately predicts the trends of next season's market is doing well. If he designs a product that stands up under competition for four or five years, his forecasting has been far better than average. Style depends on the trend of mass buying psychology which is sometimes surprisingly variable.

Many industrial designers, unfortunately, have used style forecasting as a means of achieving publicity — a practice which has made the public distrustful. A designer's dream of an all-plastic teardrop automobile may seem inviting in the Sunday supplements, but the car the consumer actually wants — and selects on the salesroom floor — is quite unlike the dream. The reputable industrial designer combines vision and imagination, essential characteristics of his talent, with research and practical knowledge to produce designs that will see production and must face the stringent tests of reality. The long-range forecasts of things to come are at best the stimulation of public fancy and as such they serve a purpose — but they should not be confused with current production problems.

A designer's knowledge and observation enable him to anticipate general style trends and thus keep his client's product in public favor. He knows that modern or contemporary style has come of age and is being accepted by the majority of our population. Modern homes and furniture are increasing in popularity because they are functionally better than traditional types, and because modern design has left behind the stark simplicity and cold formality that repelled average buyers a few years ago. People want warm, friendly and informal homes, especially when they live in the impersonality of our larger cities. Modern design can satisfy these demands.

The trend toward luxury, expressed through richer materials and ornamentation, is apparent today. Present signs of increasing consumer buying power and demand indicate that it will continue, because style is influenced by national prosperity.

Industrial design may be more intelligently applied to products and services, and style trends may be more accurately forecast, if basic axioms of the applied arts are appreciated as they pertain to our society today. The following points indicate the trend of design as influenced by present-day living and as applied to modern products:

1. We are living in an era of unprecedented change and the rate of change is accelerating. Our technical knowledge is expanding rapidly, and greater appreciation is being accorded to esthetics and the humanities as our understanding of them increases. It is safe to forecast that some day research in esthetics and in the mores and behavior of man will be considered as vital as the industrial research we have carried on so well. When this era comes, art will serve a more precious and vital purpose in daily living than it does today. *Humanity may profit as greatly from artistic as from scientific research.*

2. Style obsolescence as a means of moving merchandise is *not* wasteful. Based directly on mass production and mass sales, it is essential in a free economy to the broader distribution of a greater volume of goods. It would probably be economic waste in any other society, but in the American system of private enterprise, it stimulates continued effort on the part of the manufacturer to give the consumer something better, and as such is a means of raising our standard of living.

3. Industrial design as we know it exists only in America and can exist only in a competitive economy based on free enterprise. European manufacturers do produce merchandise by mass production and many of these products are styled. *However, they have not grasped the concept of style obsolescence as a means of moving more merchandise.* They have not used style as the means of stimulating mass buying. Proof of this fact is that there are substantially no industrial design studios comparable in size or scope of talent to the many organizations in this country. Industrial design as a profession does not exist in Europe because there is so little demand for this service. It is safe to forecast that there will be — particularly in those countries that retain some of the elements of free enterprise. American styling of automobiles, refrigerators, radios and many other consumer items has definitely helped the acceptance of our products in the world's market despite high tariff barriers. Great Britain particularly, if she expects to continue to keep her prosperous world trade, will have to resort to better styling in competing with American merchandise. *Style is universal in its appeal because human sensitivity to art expressions is universal.*

4. While art appreciation can be intensified by education, applied art is generally appreciated by all levels of society, regardless of education or economic status. Indeed, many primitive cultures show more art sensitivity than our own. Good styling is as important a sales stimulant for a product sold in Woolworth's as it is for a luxury automobile.

5. We are now entering a period of growing style consciousness. The American consumer expects his product to be well styled and is increasingly sensitive to good design. A growing proportion of our national advertisers feature styling in their copy. This is some index of a growing consumer demand for better products. All styles will not be good — but on the whole, the standards of consumer taste are rising.

6. As the profession of industrial design matures, it will become more highly specialized, as have the engineering professions. This will permit better styling of an ever-increasing number of products, including articles that only a few years ago would never have received style consideration. To work in close harmony with product engineers, industrial designers need intimate knowledge of modern production technologies. These are becoming so diverse, and competition so keen, that specialization for the designer will be a natural corollary.

7. Progress in the sciences stimulates progress in the arts, because new materials and techniques are born. We may therefore anticipate continuous development and growth in the applied arts in the future.

8. *Man must learn to live with the machines he has developed! The great new field now open to research is correlation of the machine age with the arts and humanities, to find ways to enrich modern living.*

9. The measure of success of a free economy is in *production.* Well designed low-priced products efficiently marketed are industry's prime means of making democracy work. We cannot have mass production without a profit to the manufacturer who risks his capital and exerts his ingenuity toward product betterment. The primary function of the industrial designer is to build profits for his clients. This is not mercenary—it is common sense.

10. One of our greatest national assets is our *mass expectation of better and better things.* This is essential to progress because the rewards inherent in consumer acceptance will stimulate greater ingenuity and investment.

11. We are entering a period of greater investment in research. Our larger corporations have proven that well-guided research pays handsome dividends. Also, in a period of high taxation, money spent for research is invested in the future. We can safely anticipate that more and more companies, both large and small, will make greater provision in their budgets for industrial and consumer research.

12. Art in industry is art for the greatest number. In a way it is socialized art penetrating all levels of our society. Art cannot be regimented. Freedom of expression is an essential environment to the creative arts—a primary reason why America has become a world leader in the applied arts.

13. For the first time in human history, industry is sponsoring the arts on a tremendous scale. The trend is new, as yet only partially defined, and it is growing rapidly. If it is carried forward at the present ever-accelerating pace, the whole face of our country will be profoundly changed in the next 30 years. We are living in a dynamic age—one when mankind's knowledge is expanding and time-distance between nations is shrinking. No one can foresee what life will be like 30 years from now, but it is certain that it will be very different from what we know today. The highest aim of industrial design is to help the fine and applied arts to march abreast with scientific advancement to make our lives tomorrow richer and of ever greater purpose.

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Paul Theobald has been stimulating in his complete cooperation as publisher — seeking no compromise with quality in creating a better book.

Above all, the Author is indebted to the several hundred clients he has served in the past ten years. Their cooperation in the application of design to their products and services has molded the philosophies on merchandising expressed in this book.

J. Gordon Lippincott

ABOUT THIS BOOK AND ABOUT ITS AUTHOR

Industrial design is art applied to mass production and merchandising. It is a combination of consumers-industrial research seeking what people want, and the economic means of providing for these wants. It has the frank objective of increased sales and profits. It benefits the consumer in providing a better product, and the manufacturer in yielding a greater return on his investment; as such it becomes a potent force in our economy.

In the competitive years now upon us, every means will be used to assure increased sales advantages in improved function and appearance of a product. There is therefore a need for deeper understanding of art applied to mass production and in this book the author clearly delineates the fundamentals of good industrial design.

DESIGN FOR BUSINESS is directed to the manufacturer as well as to the artist and student. It does not attempt to show how to be an industrial designer, but rather how to apply art to merchandising in the broadest sense. It treats art as a tangible medium that can be understood and used to the benefit of nearly every business.

224 pages with over 300 illustrations—from fountain pens to aeroplanes.

J. GORDON LIPPINCOTT

J. Gordon Lippincott was born in 1909 to a country Quaker family. He graduated with high honors from Swarthmore College in engineering, taking all his electives in the arts and humanities. After graduation he received a Fellowship in Columbia University in engineering and before Industrial Design was widely applied wrote his graduate thesis on "Art and Engineering."

Since 1935 he has been an Industrial Design Consultant with J. Gordon Lippincott & Co. for over 300 nationally known manufacturers including L. E. Waterman Company; Soundscriber Corp.; Paramount Pictures, Inc.; Republic Aircraft Corp.; Fuller Brush Co.; Walgreen Drug Stores; Western Electric; Radio Corporation of America; General Electric Co.; Great Atlantic and Pacific Tea Co.; R. H. Macy Co.; Mead-Johnson Co.; Northwest Airlines, Inc.; Barbizon Plaza Hotel; United Airlines; Tucker Corp., and many others.

He has worked in the engineering and styling of highly competitive appliances such as vacuum cleaners and office duplicating equipment down to pure glamor products such as cosmetics and perfume. He has developed such highly functional capital equipment as automatic stokers and large projects such as automotive and aircraft styling. At the point of sales he has had broad experience in the design of super markets, gasoline stations, theatres, stores, and hotel interiors. From this broad gamut of business experience covering nearly every phase of American industrial activity, he has written this book as a guide toward the better application of art to successful merchandising.

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