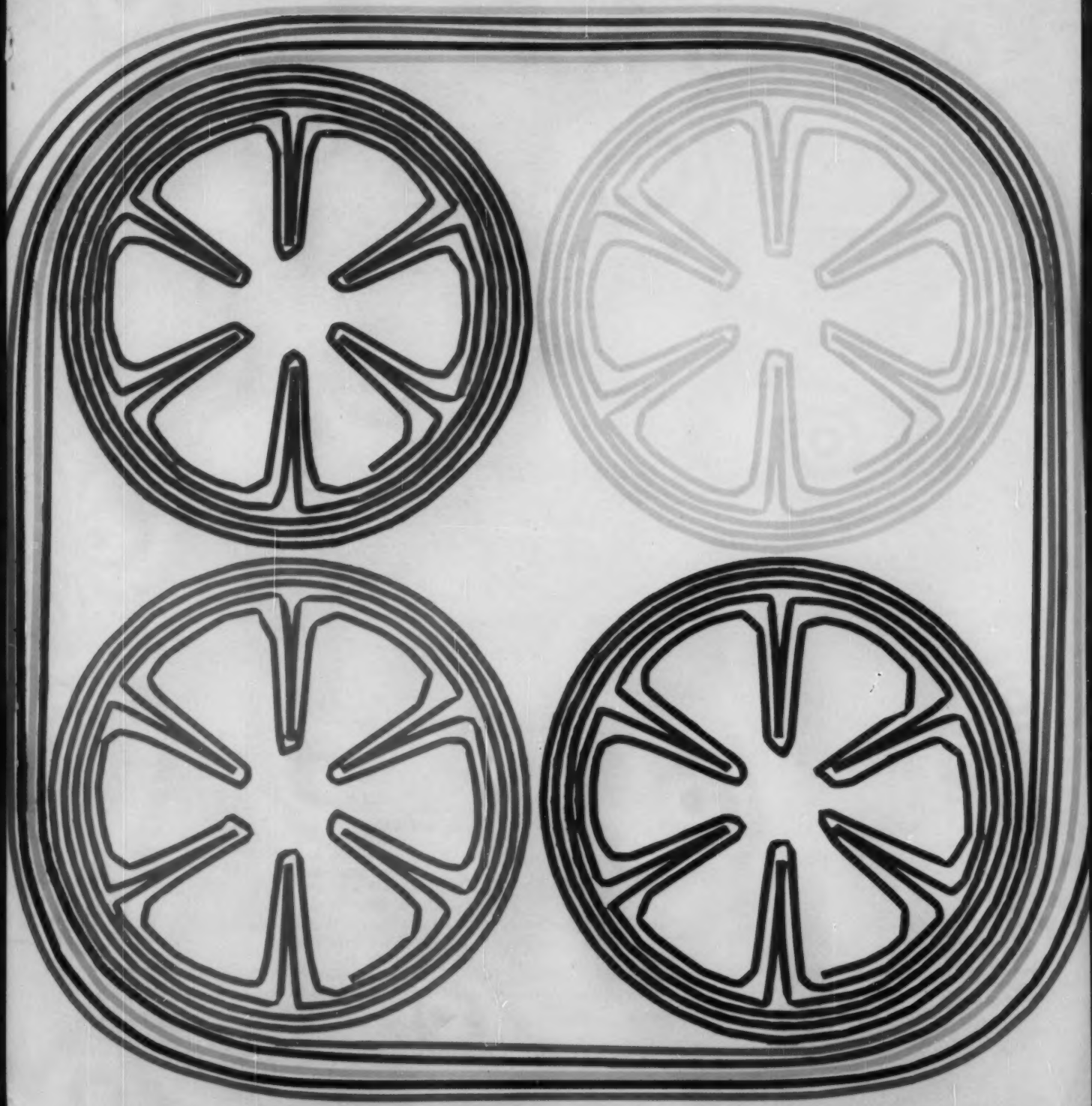
INDUSTRIAL DESIGN

8 *August 1960* *$1.50 per copy*



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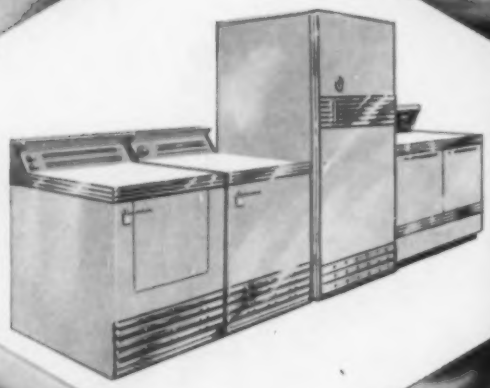

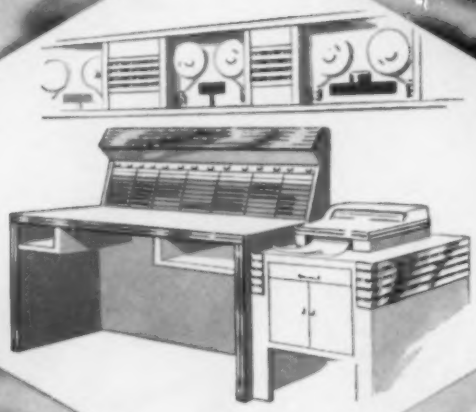

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ID

MEMO TO ADVERTISERS

INDUSTRIAL DESIGN

...the magazine for the men whose decisions today shape the products of tomorrow

The 7th Annual Design Review -- December 1960

Based on twelve full months of study and planning, INDUSTRIAL DESIGN's December issue, the 7th Annual Design Review, will single out the new, the trend-setting, the worthwhile, for presentation to the men whose designs today will sell the products of tomorrow. It will be read and referred to again and again through the year to come by a majority of America's independent and company designers.

Your advertising message in this long-lived issue will be noted repeatedly by the men whose business it is to specify methods and materials that will enable products of every description to succeed in the market place.

The advisability of your advertisement in the 7th Annual Design Review is further indicated in the following statement by Mr. Chester H. Brown, President, Allied Chemical Corporation. (Mr. Brown's company has been a substantial advertiser in INDUSTRIAL DESIGN since 1957.)

> "Industrial design has achieved a significant influence in a short span of years. The time is past when good engineering alone sold a product; good engineering and good design have become interdependent. We at Allied Chemical appreciate the contribution the industrial design profession makes in broadening the field of application for many of our products."

May we suggest that you contact this office for further information regarding this highly significant 7th Annual Design Review?

Cordially,

Paul R. Kane

Paul R. Kane, Vice-President
and Director of Advertising

AUGUST, 1960 VOLUME 7 NUMBER 8

INDUSTRIAL DESIGN

A monthly review of form and technique in designing for industry. Published for active industrial designers and the executives throughout industry who are concerned with product planning, design, development and marketing.

CONTENTS

Coming

IN SEPTEMBER—Report from Milan on the 12th Triennale; new developments in plastics.

IN OCTOBER—Special issue on New York as a design region.

COVER: Two companies featured in this month's Research and Development article are symbolized by their products on Peter Bradford's cover: Caloric burners drawn with Ampex tape.

FRONTISPIECE: Ezra Stoller's photograph of a section of the demonstration model of the human brain which Will Burtin has designed for Upjohn (see page 66). The aluminum dome represents the recently-discovered centrenchephalic system of the brain, which acts as a kind of nexus between incoming stimuli from the senses and outgoing motor impulses.

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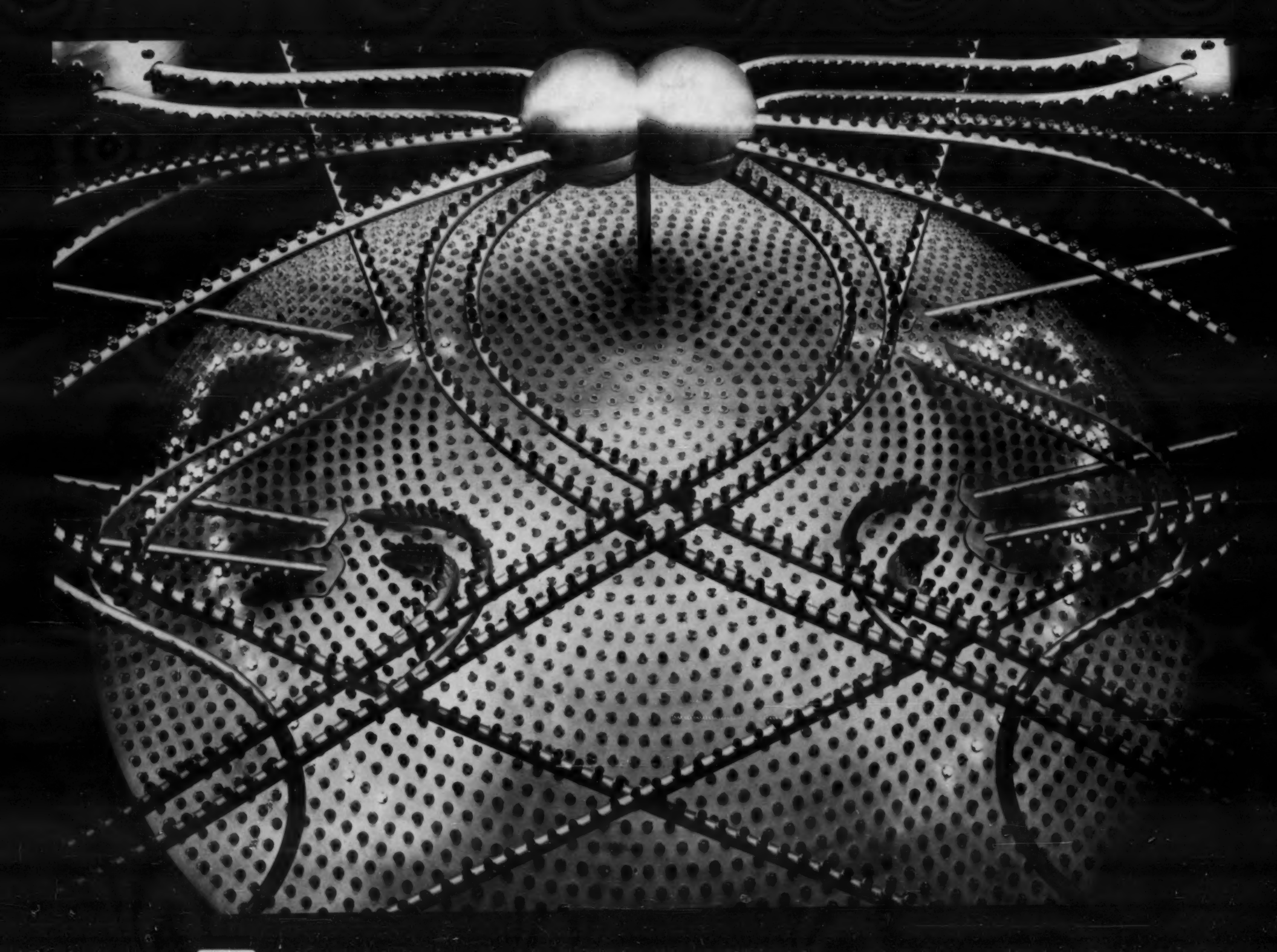

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RESISTANCE TO TEAR AND ABRASION

Enjay Butyl offers the highest aged tear strength of any rubber . . . even after long exposure to ozone and heat! Its inherent toughness resists abrasive wear, in such applications as tires, conveyer belts, hose and other mechanical goods.

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Enjay Butyl has proven its resistance to ultra-violet light, ozone, oxidation, moisture and mildew. Increases life of products such as weatherstrips, garden hose, wading pools and automotive parts.

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Enjay Butyl requires no additives for quality coloring over a wide range of hues. Famous for colorability and smooth finishes, Butyl has been successfully plastic coated for special applications.

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Enjay Butyl absorbs shock and vibrational energy more completely than any other rubber. Resiliency can be varied in compounding and processing. Butyl is ideal for axle and body bumpers, motor mounts and sound-deadening applications.

IMPERMEABILITY TO GASES AND MOISTURE

Enjay Butyl is tops in impermeability to gases and moisture . . . retains air pressure 8 times better than natural rubber. Outperforms other rubbers in such application as inner tubes, jar and bottle seals, hoses and inflatable goods.

ELECTRICAL RESISTANCE

Enjay Butyl tops all vulcanizable rubbers in electrical and dielectric properties . . . in resistance to corona and ozone breakdown and water absorption. Its high dielectric strength insures against electric breakdown under normal or surge voltage. Its heat resistance permits higher current flow for a given conductor size.

The outstanding properties of Butyl Rubber create new horizons for the designer, and offer to manufacturers an opportunity to utilize the qualities of rubber in applications never before possible. The unique properties of Butyl have led to vast improvement in many existing products. Technical skills will open the way to countless new uses.

Butyl is the "idea" rubber with uses stretching as far as the imagination can reach. We'll be glad to tell you all about it. Just contact the nearest Enjay office.

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ENJAY® BUTYL

IN THIS ISSUE

Schladermundt

Miller

Burtin

Kaufmann

D'Annessa

Judith Ransom Miller has made the annual pilgrimage to Aspen for the past five years, and for the past two has been ID's official reporter at the International Design Conference (page 80). This is her third appearance on our pages, the first being a provocative article on mail-order merchandising in June, 1958. At that time we scarcely knew who Mrs. Miller was. We now know she is a part-time instructor in art at UCLA, and that she is married to the chairman of the art department at Long Beach City College.

Peter Schladermundt has been grooming and currying Mobil's Flying Red Horse since 1956, when he re-designed the firm's corporate symbol. Although the assignment has covered a wide range of products and equipment, no project has been quite so extensive as the one most recently completed (page 48). Schladermundt, an architect by training, has been an industrial designer since 1929. He was one of Norman Bel Geddes' senior partners; formed Van Doren, Nowland & Schladermundt in 1943; and now, as the head of Peter Schladermundt Associates, works in the fields of product, packaging, and exhibit design, corporate identity programs, and interiors.

Will Burtin is probably the unofficial dean of medical exhibit designers. Several years ago his "Basic Cell" (ID, August 1958) drew commendations from medical scientists for the clarity of its representation of a complex life process. In his latest structure (page 66) Burtin has provided a demonstration of the functions of the human brain. Originally trained in Germany as a typographer and printer, he studied design at the Kolner Werkschulen, came to the U. S. in 1938, and now devotes most of his time to his own design studio, which specializes in exhibitions, motion pictures, displays, editorial design, and packaging for such firms as Upjohn, IBM, and Union Carbide.

Edgar Kaufmann, Jr., shown here as he looked when he wrote the precepts on page 50, now revises some of his own words on this subject, noting that the words were never intended as absolutes. Author, editor, critic, and director of the Museum of Modern Art's Good Design program (1950-1955), Kaufmann is currently devoting his energies to the preparation of a new book on design, and to administering the Kauffmann International Design Award, established earlier this year in honor of his father.

Henry D'Annessa, whose stock in trade appears on page 62, is proprieter and resident artist of Tony's Tattoo Studio, with clinically antiseptic office and showroom off New York's Eighth Avenue. Mr. D'Annessa prepared for his arcane craft by studying commercial art at the Art Students League, to which he plans to return in the fall for advanced study. The designs on pages 62 and 63 were done by Professor Milton Zeis, of Rockford, Illinois.

CYCOLAC®

THE BORG-WARNER PLASTIC THAT'S TOUGH, HARD, AND RIGID

A lighter, more economical traveling weight . . . the ability to take constant use and abuse . . . the soft, textured look of leather—these were the requirements specified by Seward† for the outer shell of their new line of luggage. CYCOLAC—the tough, hard, rigid plastic from Borg-Warner—met every test and then some!

Like Seward and the countless travelers who use this luggage, many important manufacturers are "going" CYCOLAC for longer mileage, lighter weight and lower fares. Why not discuss the advantages of this remarkable plastic with one of our representatives. Write today.

†Shell of CYCOLAC extruded and formed by O'Sullivan Rubber Corp., Plastics Div

MARBON CHEMICAL DIVISION **BORG-WARNER**
WASHINGTON WEST VIRGINIA

LETTERS

The ego and the image

Sirs:

To have an occasional drink, or try total immersion? Should a public relations practitioner dip himself in the language and lore of the industrial designer, or drown in it? When can a little knowledge of a particular craft be a dangerous thing, and a lot of it fatal?

These are questions answered in part in your excellent article "Public Relations for a Profession" in the May issue.

The ultimate question, we think is this: When, in his orientation in industrial design, does a PR person risk forfeiting his primary role? What is that role?

The PR practitioner—outside counsel or "company man"—has the main function of interpreting the industrial designer and his work.

But interpret to whom?

If the PR man becomes the alter ego of the industrial designer, speaking and understanding the profession flawlessly, he may do a great job of impressing—other industrial designers.

If he maintains objectivity, an aloofness from the esoterics of the profession, he stands a better chance of interpreting, in language understood by the "outsider," those who should be impressed: prospective clients.

In between the alter ego and the aloof image builder lies the ideal PR person.

He understands his client, admires his creativity, attempts always to broaden his perspective; dramatizes those parts of the designer's makeup that lend themselves to "outside" understanding, and shrouds the remainder (which may be of no consequence, or of interest only to other designers).

He is intensely loyal to his client, but more loyal to his client's prospective clients. To please only his client can often be a disservice to those "outside." They can understand the industrial designer, not in words and image portrayals that please the designer, but in strokes and words that are readily understood by those unwashed in the clinical vocabulary and paint of the expert.

Presuming there is no ideal PR man, but only aspirants, in which direction should the PR man lean? Where, if he errs, is he most likely to land softly . . . in the long run? Should he, at all costs, continue to please his client?

What is the overall objective of industrial designers as professionals? Is it not to have their "secret potion" distilled so as to be savored by the whole community—at least a segment of the commercial community who are likely to find a need for the drink after they have understood its ingredients?

So long as the PR practitioner mixes a cocktail to please his client alone, he won't sell much of the stuff in the bistro.

Brooks Stevens
Brooks Stevens Associates
Milwaukee, Wisconsin

A Distorted Image

Sirs:

"Objectivity at Work," your article on contract research, is interesting to us and will probably be completely fascinating to the untutored. But to the knowledgeable people in the field, the article carries all the overtones of satire.

Emphasis on the "genius-at-work" approach, "cute" on-the-spot analysis, and "inspired" solutions to problems, ignores the basic fact that the type of activity required is usually characterized by a lot of hard work, sweat and plain common horse-sense.

In attempting to glamorize the subject, you have, in our opinion produced a distorted image, which can result in substantial disservice to the industry.

Arthur F. Segreto
International Management Institute
Syosset, New York

"On the Subject"

Sirs:

It's encouraging—but perhaps not surprising—to find an outstanding publication, devoted to design and technological progress, taking an interest in human values as well.

I thought your June editorial (Off the Subject?) was exceptionally well designed and right on the beam.

A. E. Peters
Rockford, Illinois
Howard H. Monk & Associates, Inc.

Credit Claimed

Sirs:

When you included the Aluminized Fire Fighter's Suit in the Annual Design Review (Dec. 59, page 84) and didn't give credit to the original designer (myself) or his agency (U.S. Army Engineer Research and Development Laboratories, Fore Belvoir, Va.) I was willing to let it pass since the credit was still in the Army "family"—it being given to the U.S. Army Quartermaster Research and Engineering Command (not "Council," please), who had unfortunately been bypassed in the original publicity. (The design originated in our labs and was developed by the Quartermaster).

But then you did it again! In "Aluminum as a Design Material" (May '60, page 53) you use another photograph of the Fire Fighting Suits, and credit it to Reynolds Metals.

I think it is about time that we claim some credit. Both photographs were taken by the U.S. Army Engineer Research and Development Laboratories, of the prototype suits.

John F. Christian
U.S. Army Engineer Research and Development Laboratories
Fort Belvoir, Virginia

ID conscientiously tries to give full design credit wherever possible. It often is not possible when designers fail, as Mr. Christian did in these two cases, to get their clients or suppliers to give them proper credit.—Ed.

Golddust Twins?

Sirs:

ID is to be congratulated for highlighting the significant work being done by public relations practitioners in the industrial design field (May, 1960 issue). Public relations has made great strides in recent years in helping to develop a good image for the profession.

In the area of imagery, design and PR are almost like the "Golddust Twins." In the early days one sees the beginnings of the wedding process when Earl Newsom, PR man, and Norman Bel Geddes, designer, were partners.

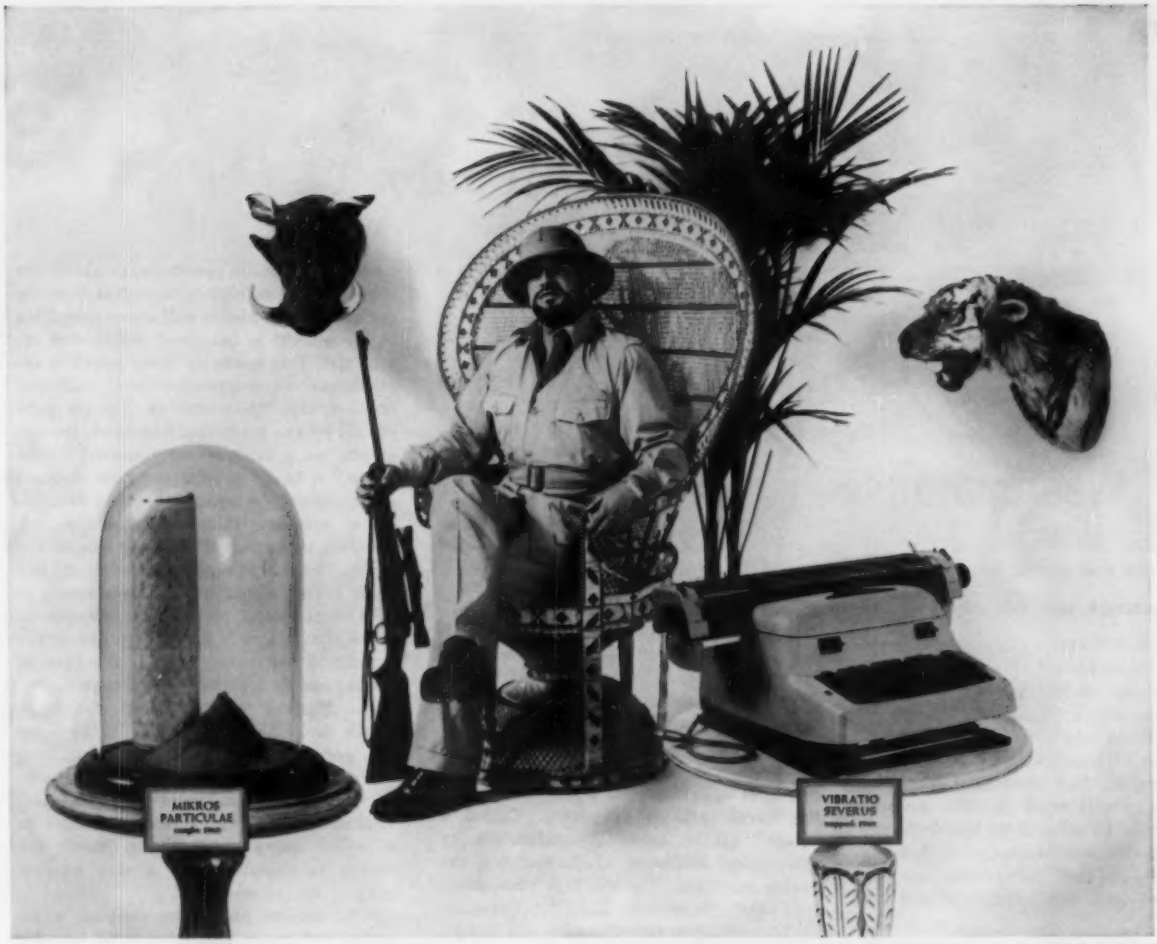
Donald G. Keen
Lippincott & Margulies
New York

Where credit is due

The newest Baker cocoa package (July, page 37) was designed by Eron & Eron, who are currently responsible for all Baker's packaging redesign.

Erratum

Dromedary Dates is one of Nabisco's lines, not one of General Foods' as stated on page 32 of the July issue.



To trap microparticles ... or vibration ... rely on A+ Felts

The versatility of A+ Felts makes them ideal for solving engineering and design problems as different as purifying liquids or gases with the AFCO FEUTRON® felt filter cartridge, and isolating machinery vibrations with VIBRA-MOUNT® absorber pads. These are but two of the end-results of the custom engineering with which A+ Felts are created to meet demanding sets of specifications.

The AFCO FEUTRON felt filter cartridge is precision engineered of chemically pure fibers . . . of uniform diameter . . . giving consistent cartridge density and filter performance throughout its micron range. VIBRA-MOUNT felt is used for insulating production equipment, business machines and sensitive instruments. It reduces transmitted vibration by as much as 85%.

Learn how A+ Felts can improve *your* application. Send us your materials problem. Our engineers will follow through promptly.

A+ FELT ABSORBS, SEALS, INSULATES, FILTERS, CUSHIONS, POLISHES, DECORATES

Send for this helpful **FREE** brochure showing the many uses of A+ Felt as a design and engineering material.

American Felt Company

Paul Rand's new logo-trademark

Noyes

New Westinghouse design program

Westinghouse Electric Corporation introduced a new corporate symbol, along with the candidates, on its telecast of the Democratic convention last month. Designed by Paul Rand, the new symbol (above, left) is the fifth such change in Westinghouse's graphic face since 1900. The previous change was made in 1953. According to Rand, "In spite of its new look, the trademark still retains enough of its basic appearance so that carry-over recognition is not lost, but reinforced and refined.

"This is made possible by altering substantially only one of its original components—the 'W'. This new 'W' is not only legible, but it also suggests some very pertinent ideas, such as a molecular structure, wires and plugs, a wiring diagram, tubes and light bulbs."

The "Westinghouse" logotype has been redesigned from a Caslon face to a type specially designed to give the name distinctiveness and swift legibility.

Redesign of trademark and logotype is Westinghouse's first effort in what it calls a "broader design program" instituted earlier this year. Architect-designer Eliot Noyes (above, right) was hired in April as consultant director of the new program. The company is vague about what the design program will entail, but the first step will be to establish graphic standards for all company literature and advertising copy to conform to Rand's new trademark-logo. As for the future, Corporate Design Coordinator R. E. Hupperts says that "eventually we hope to effect a change in all visual aspects of the Corporation."

Hughes scientist amplifies light

The first true amplification of light, constituting what is claimed to be the most important advance in the science of electro-magnetic radiation since the amplification of radio frequencies into the microwave region, has been achieved by a Hughes Aircraft Company scientist.

The feat was made possible by an experimental instrument, developed by Dr. Theodore H. Maiman and unveiled last month in New York, which increases the power of a light signal without changing its wavelength or frequency. Called a "laser" (from Light Amplification by Stimulated Emission of Radiation), the device generates, for the first time, what is called "coherent light." (Ordinary sources of light, like incandescent lamps, are "incoherent" since they simultaneously generate energy over a relatively large section of the electro-magnetic spectrum. Like radio transmitters, on the other hand, the laser generates light energy over a narrow band of frequencies—something never before accomplished.)

In practical terms, the new device pushes the upper limit of the radio spectrum (presently about 50,000 million cps) up into the visible spectrum, or about ten thousand times higher than has been so far attainable, and it will allow scientists to focus light in beams of unheard-of intensities. This opens up many possible applications—in communications, medicine, physics, and space studies. Signals generated by the laser could be used, for example, as a kind of inter-spatial "light radar." A beam of coherent light focused on the moon, for example, would illuminate an area less than ten miles wide. (A searchlight beam, if it could reach the moon, would spread out over 25,000 miles.) This would allow astronomers to take super-clear pictures of objects in space. Dr. Maiman foresees other applications in the study of the structure of matter and in technological research.

Maiman and laser

Dr. Maiman explains how the laser works thus: "A light source, in the form of a powerful flash tube lamp, irradiates a synthetic ruby crystal which absorbs energy over a broad band of frequencies. This optical energy excites the atoms to a higher energy state from which the energy is re-radiated in a very narrow band of frequencies.

"The excited atoms are coupled to an optical resonator and stimulated to emit the radiation together. This is in contrast to ordinary light sources where the atoms radiate individually at random and is responsible for the incoherence of these latter sources."

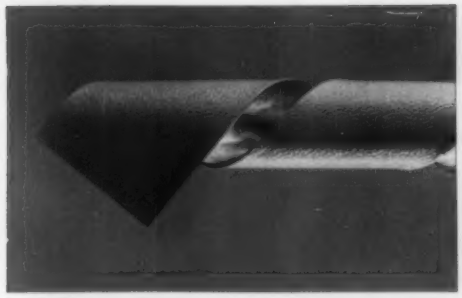
New Budd cars

Subway cars go stainless

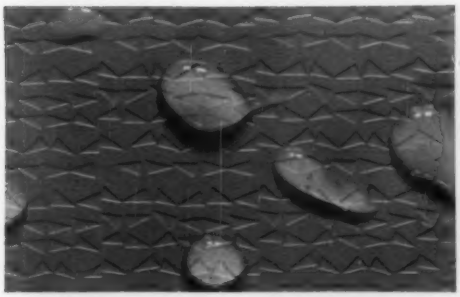
The first fleet of stainless steel and reinforced plastic rapid-transit cars went into service on Philadelphia's Market-Frankford subway - elevated line last month. Engineered and built by The Budd Company (with architects Harbeson, Hough, Livingston & Larson consulting on interior design), each of the 270 new cars (above) is designed as a girder, using the roof and floor as the chord members

Continued on page 24

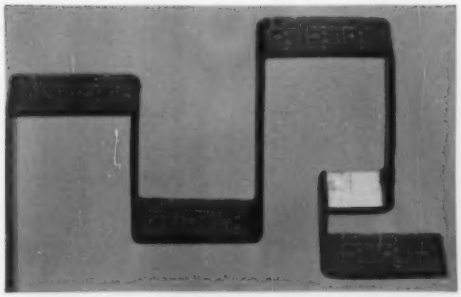
Twist it



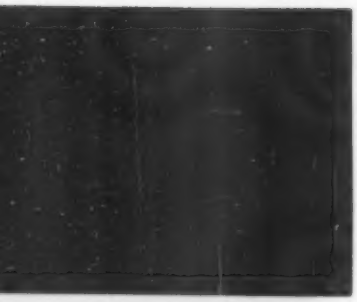
Wet it



Form it



Design with it



USS Vinyl Coated Steel Sheet ● Here is the look and feel of leather or fine cloth, or any other texture you want, bonded and cured directly and permanently to steel. Here is a complete spectrum of color, too, in a material that is inexpensive, versatile, tough enough to take the hard knocks and strong enough to be used in the most demanding applications. USS Vinyl Coated Steel Sheet is easy to clean, resists spotting and staining, can be fabricated easily and inexpensively. It opens up many design possibilities in both consumer and industrial markets. It offers these advantages:

Twist it The surfa
peel. Here is tough viny
duced in any texture, a
strength of steel.

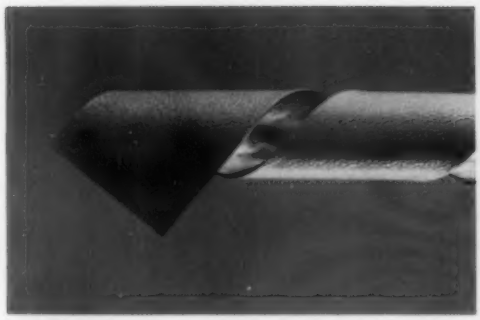
Wet it Try to spot it
Steel Sheet won't wat
stain it with die lubrica
ers, fountain pen ink, a
detergents, acid clean
fruit acids.

Form it You can sl
roll form it. USS Vinyl Co
lock seamed easily. Spe
been developed so yo
no damage or discolora

Design with it
doors, appliances, fu
and station wagon in
interiors, business ma
ing, switch panels, alm
is subjected to abuse.

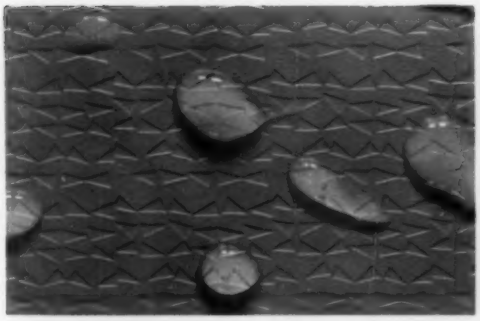
USS TRADEMARK Vinyl C

surface won't crack or
vinyl that can be pro-
re, any color, with the



Four examples of the many patterns

pot it. USS Vinyl Coated
water spot. You can't
ricants, alkaline clean-
nk, alcoholic beverages,
leaners, nail polish, or



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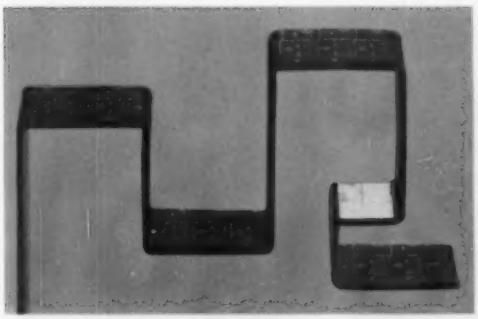

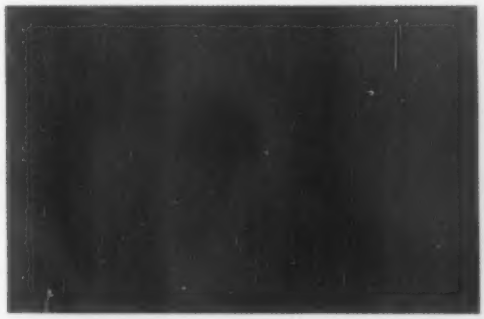

in vinyl coated steel.

n it Building interiors,
, furniture, automobile
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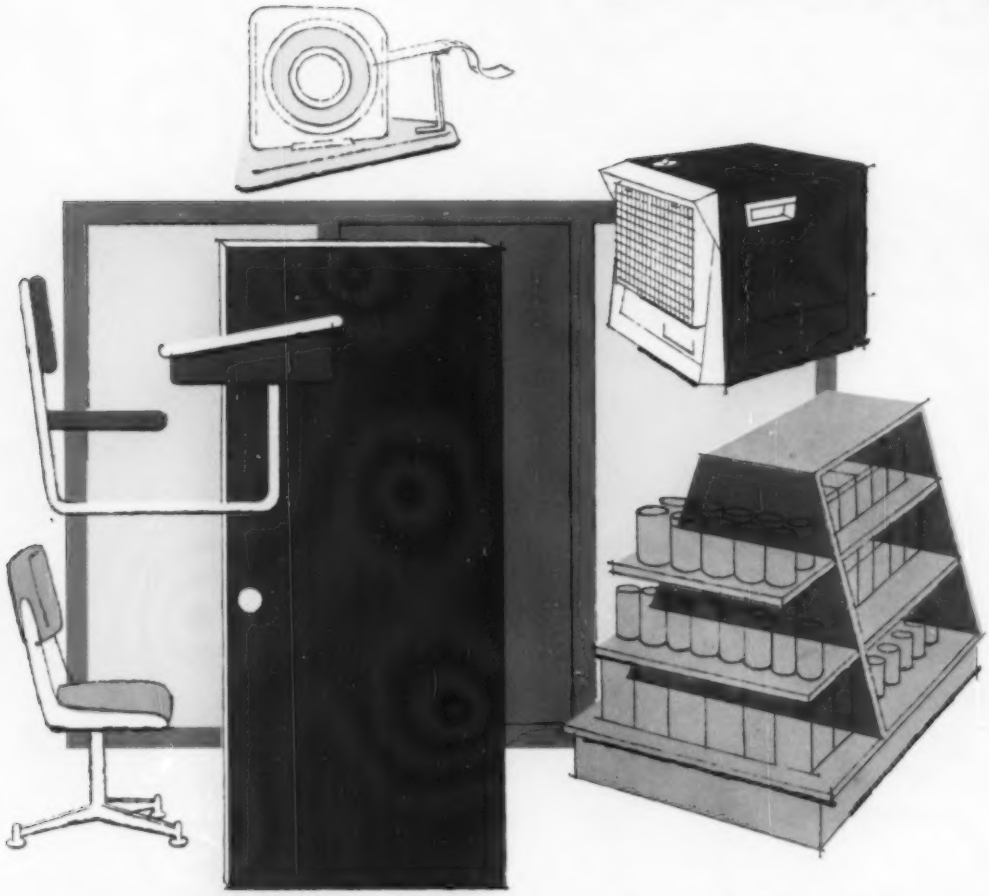
machines, store shelv-
almost any product that
use.

Coated Steel

This mark tells you a product is made of modern, dependable Steel.

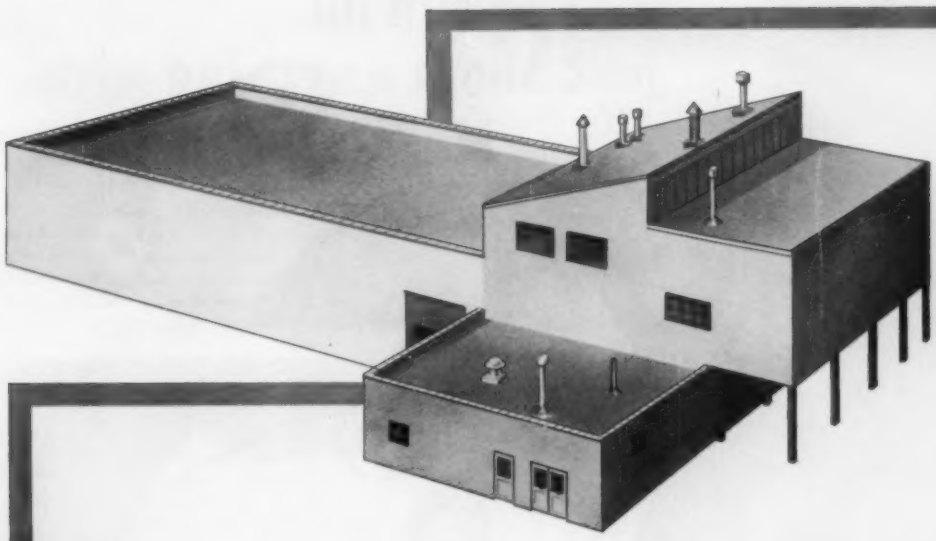


Here are just a few suggested applications for USS Vinyl Coated Sheets: A colorful room divider partition. Face panels are interchangeable; panels of different colors or textures can be easily inserte A portable space heater that is scuffproof, also available in any color or texture. A lobby do that defies scuffs and hand prints, is easily cleaned; color and texture can adapt to any interior deco tion. For long term service, smart appearance with practically no maintenance, vinyl steel store she ing meets the requirements of heavy use in any color. Contemporary office chairs covered with U Vinyl Coated Sheet that will last.They look and feel like leather; actually they're strong steel. A sch desk that will take years of hard knocks, yet look like it's going through its first term. For the hon a tape dispenser with extra sales appeal because it has the look and feel of fine leather.

USS Vinyl Coated Sheets can be adapted to these and thousands of other uses. It is competitive in pr with other materials. It will not support combustion and it has a dielectric strength of 750 volts per mi coating thickness. It is available in gages from 16 through 32, widths from 24 to 52 inches, in coils up 10,000 lb. Vinyl coatings are 0.008 to 0.020 in. thick.

Samples and technical assistance are readily available from U. S. Steel. Or send for our 20-page, full color technical book, "USS Vinyl Steel." Write United States Steel Corporation, Room 6121, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS TRADEMARK **United States Ste**



How does this new resin plant benefit designers?

It produces *better* resins at lower costs . . . and better resins produce *better* MOLDED FIBER GLASS . . . and better and lower cost MOLDED FIBER GLASS offers designers far greater opportunities for creating new designs, and using MOLDED FIBER GLASS for applications where high cost had previously prevented its use.

This is the new Molded Fiber Glass Resin Plant . . . built to produce resins for the affiliated Molded Fiber Glass Companies.

Resins produced in this plant are far more uniform . . . thus, products made by the Molded Fiber Glass Companies are exceptionally uniform.

Resins made in this plant cost 20% less . . . thus MOLDED FIBER GLASS products cost less.

In addition, certain special qualities have been greatly improved in these resins: strength, impact resistance, chemical resistance, resistance to weathering, etc. Thus, designers can now specify MOLDED FIBER GLASS for uses where previously it was not practical.

Next time *you* have a job requiring a strong, lightweight, low-cost material . . . specify MOLDED FIBER GLASS . . . as matched-metal-die-molded by the Molded Fiber Glass Companies. Write today for technical brochure and detailed information on custom molding your designs.

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for example Masonite offers you a complete choice of thicknesses, densities, textures and patterns; wonderful workability; a smooth surface that takes and holds any kind of applied finish, from chalkboard to silk screen. And Masonite makes available to you walnut and cherry wood-grained panels in a wide variety of sizes.

in fact Masonite provides three popular finishes: save-a-step Primecote, rich wood grains, and fabricator finishing...plus two exclusive new features for do-it-yourself customers: (1) the Nu-Seal process—a clear, nonglossy finish that makes for smooth, even, permanent finishing in your own plant; (2) drum sanding —exact calibration that means the precise board thickness you want. Edge-to-edge and top-to-bottom uniformity means quick receptiveness to your finishing operations.

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Coming in the September 1960 issue of

INDUSTRIAL DESIGN

The Triennale

ID's editor in Milan reports fully on the 12th Triennale di Milano (previewed on page 74 of this issue). The theme this year is home and school, and next month's coverage will include the products, the exhibition techniques, the designers (including statements by many of them) and the flavor of Milan itself during the fair.

Plastics Review

To bring designers up to date on the latest developments in the plastics industry, ID will publish:
1) an article by Montgomery Ferar on blow-molding for the industrial designer, showing the refinements that have caused a boom in an old method, and explaining how new techniques may be used.
2) a full treatment of the decorative uses of acrylic plastics from the designer's viewpoint.
3) a round-up of the latest plastic materials and fabrication techniques.

Wescon

The 1960 Western Electronic Show and Convention will be held from August 23rd to 26th this year in Los Angeles. Its second Annual Industrial Design Awards program is composed of 25 examples of outstanding electronic design, chosen from products and systems all over the country. ID shows a selection of these, accompanied by a statement by designer Henry Keck, one of the jurors, who discusses the reason's for the jury's choices, and its conclusions about the general state of electronic design.

Design review

A review of the most recent electric and non-electric housewares, including a selection of new products shown at the Atlantic City exhibit of the National Housewares Manufacturers Association.

Gallery III

The third in a series of profiles of industrial designers describes the factors, personal and professional, that have influenced a young man's successful and significant design career.

Each issue of **INDUSTRIAL DESIGN** *delivers to the desks of designers and executives a definitive review of contemporary design ideas and techniques.*

INDUSTRIAL DESIGN
is published monthly
Subscription rates: $10.00 *for one year*
$18.00 *for two years*
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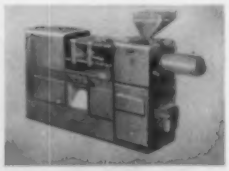
imagination
AND DU PONT PLASTICS

DELRIN®
acetal resin

Du Pont "Delrin" acetal resin is a completely new material that offers designers distinct performance and cost advantages in many applications once reserved for metals. Today, "Delrin" is being used in hundreds of products where die-cast zinc and aluminum, cast and machined brass, stainless steel and cast iron were once considered "standard". Imaginative and cost-conscious designers have taken advantage of the unique properties offered by "Delrin" to make such products better and at lower cost. Household items, sporting equipment, telephone components, gears, housings, plumbing fixtures, valve parts, clothing fitments are examples.

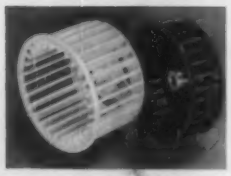
On these pages you will find some of the good reasons why "Delrin" opens the door to improved designs and examples of how industrial designers have profited from these new opportunities.

What DELRIN offers to designers



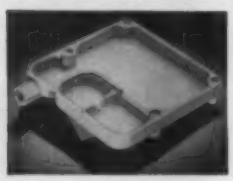
rapid, economical fabrication: Parts of "Delrin" are rapidly mass-produced via conventional injection molding or extrusion. There is usually no need for finishing operations. Assembly is simplified by a variety of fastening and joining methods. Complex parts can often be molded in integral units, thus making possible savings in costs and simplifications in design. Models and prototypes can be machined easily from stock shapes, which are readily available.

attractive appearance: "Delrin" is available in a variety of colors. In addition, varied surface effects can be achieved by texturing, vacuum metalizing or painting. "Delrin" offers designers new latitudes in décor, in such applications as the integrally colored instrument cluster (left), in bathroom fixtures, in automotive and appliance handles and in clothing fitments.



strength, toughness, dimensional stability: Outstandingly strong, rigid yet resilient, "Delrin" retains its desirable properties over a wide range of temperatures and under exposure to water, solvents, oils and greases and stress and strain. The "squirrel-cage" blower (left) is an example of many of these properties at work. A variety of gears and hardware fixtures takes advantage of the dimensional stability and toughness of "Delrin".

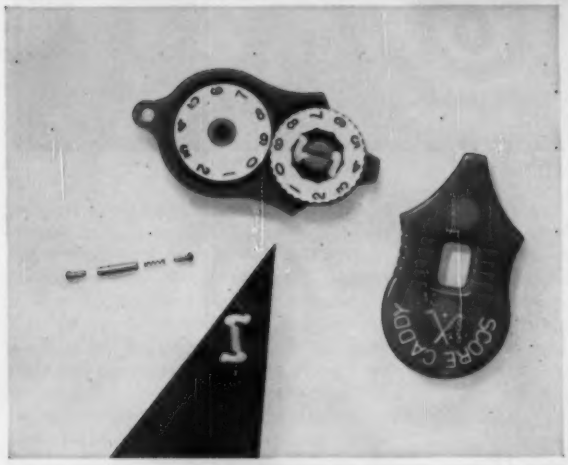
resistance to stains, rust: "Delrin" is unaffected by long exposure at room temperatures to a wide variety of common and usually troublesome substances—among them tea, catsup, vinegar, greases and oils and lemon juice. It cannot rust. The resistance of "Delrin" to body oils and perspiration, as well as its toughness and good frictional properties, makes it a logical choice for zippers (left) and other fitments.



cost savings: Because one part of "Delrin" can frequently replace several parts of another material, because costly finishing operations are usually eliminated, and because assembly is simplified, "Delrin" often permits dramatic cost savings. The textile solution pan (left) costs $25 in stainless steel; injection-molded of "Delrin", it requires no finishing, and costs approximately $3, with a weight saving of 75%.

New designs made possible by DELRIN

In the housing of this bilge pump, the use of "Delrin" permits 30 to 40% longer impeller life because of the low friction between the walls of "Delrin" and the moving part. There is also a weight saving of 1 lb. 4 oz. The manufacturer—Wilcox-Crittenden, Division of North & Judd Mfg. Co., Middletown, Conn.—reports that cost savings permit a lower competitive price.



In this golf-score counter, an indexing spring of "Delrin" replaces a metal spring, two pistons and a tube. This simplified design, made possible by the resilience and strength of "Delrin", solves a difficult assembly problem. Added advantages: the new "Score Caddy" lasts far longer and is completely corrosion-proof. (By CMS Enterprises Co., Flint, Mich.)

In a multi-stage submersible pump, precision-molded parts of "Delrin" replace brass components. Flint and Walling Mfg. Co., Kendallville, Ind., selected "Delrin" for this design because of its high strength and stiffness, dimensional stability, low moisture absorption and fatigue endurance. The company reports that "Delrin" has performed better than brass in abrasion and corrosion resistance, and permits a 75% cost saving in the parts involved.

What problems can DELRIN help you solve?

The applications shown on these pages are only a few of the hundreds of remarkable design improvements already made possible by "Delrin" acetal resin. We suggest that you investigate further the many ways in which this versatile new material may help you solve some of your design problems. Du Pont technical personnel are ready to assist you in your evaluation of "Delrin" as well as the other high-quality plastic materials offered by Du Pont, such as ALATHON® polyethylene resins, ZYTEL® nylon resins, LUCITE® acrylic resins. For more information on any of these materials, write us. Address: E. I. du Pont de Nemours & Co. (Inc.), Department T-8, Room 2507D, Nemours Building, Wilmington 98, Delaware.

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Du Pont's problem-solving plastics

connected by the sides, which join the entire car cross-section into a load-carrying beam.

In general, all primary structural members in the car framing are of stainless steel. The contoured front ends above the belt rail are of Fiberglas reinforced polyester plastic, moulded as a single unit. Flooring is ¾" plywood faced on both sides with .025" aluminum.

The car interiors are finished entirely in integrally-colored melamine plastics, stainless steel, and anodized aluminum. Interior colors are gray (ceiling), turquoise (bulkheads and wainscot), and bright coral (upper walls and side door pocket panels). Floor covering is a mottled black rubber.

French monotrack

New version of the El

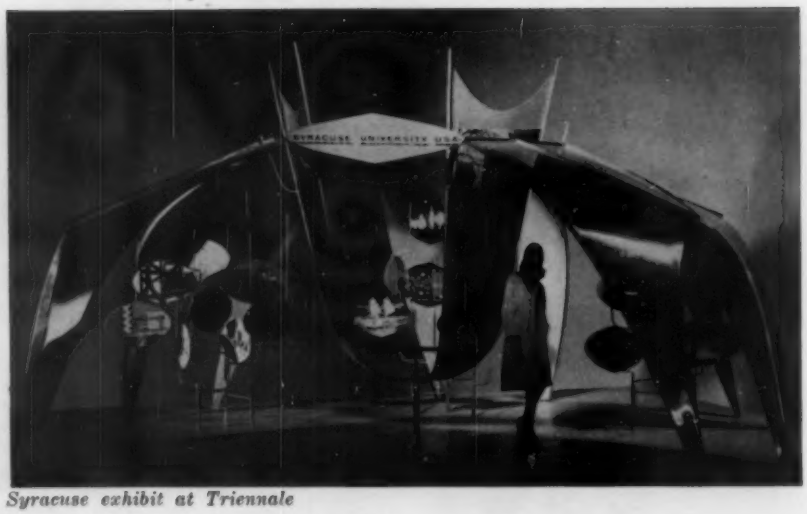
A rational French answer to the big problem of big-city mass transportation is an "elevated" monotrack unveiled in an experimental installation earlier this year outside of Orléans. Designed and built by a group of French companies (Renault, Michelin, and 16 others), the monotrack operates on a steel beam suspended on concrete-covered steel stanchions anchored at 100-foot intervals. Riding, like some of the present Paris subway lines, on rubber wheels, the aluminum monotrack car can carry 123 passengers at average speeds of over 60 mph, is expected to cost about $4 million a mile to build (or about one-fifth the price of subway construction), and is claimed to eliminate most of the disadvantages of conventional elevated systems.

The idea of a monorail suspended rapid-transit system is nothing new, however. It was experimented with in Houston, Texas in 1956, and such a line has been operating since before the war between two towns in the Ruhr district of Germany.

Syracuse at Triennale

The Industrial Design Department of Syracuse University is one of three design schools that are exhibiting at the Milan Triennale this summer. The other schools are: the Royal College of Art in London and the Hochschule für Gestaltung in Ulm.

The Syracuse exhibit (top, right), 24



Syracuse exhibit at Triennale

feet in diameter and eight feet high, consists of five aluminum members supported by a center "tree." The five units represent different stages of the five-year program at Syracuse. The three smaller aluminum-tubing "trees" inside the shelter are used to represent the three objectives of the school's program: "esthetics," "technology," and "man and society."

Design of the exhibit was by fifth-year students George Ervin and Eugene Joseph, fourth-year students Richard Suarez and David Ellis, and third-year students Ian Bruce and Charles Kellstedt. Porter-Cable Machine Company provided the necessary financial support.

Housewares show

At the NHMA's exhibition last month in Atlantic City, can openers (manual, electric, freestanding, and wall-hung) were the popular item, as at last year's show. Other products featured on many stands were knife-sharpeners, gas-mask-looking hair dryers, mops that supply their own water from a tank on the handle, and air purifiers. In general, styles had changed very little; as one manufacturer put it: "This year we have square toasters instead of round ones. Where do you think we can go from here?"

New service stations for Speedway

Speedway 79, a chain of 500 automobile service stations in Michigan and Ohio, has recently completed modernization of 17 of its roadside stations on a design by Sundberg-Ferar, Inc.

The design calls for a standardized installation featuring extensive architectural use of glass in the salesroom and service areas, as well as a new brand-name sign designed for speedy recognition at distances of over a mile. Made of angular convex Plexiglas panels installed as a kind of frieze around three sides of the salesroom, the brand-sign is illuminated from behind and emphasizes the numeral trademark "79" as a symbol more quickly noticed from a distance than the long name "Speedway." In both cases, lettering has been changed to a more fluid style, and the candlepower has been substantially increased.

Conversion of Speedway stations is reported to be immensely successful (one station has marked a jump in profits of 50 percent), and plans are underway for reconstruction of many other stations in

Above: before; Below: after

the chain during the rest of this year.

Sundberg-Ferar's design follows Speedway's previous, not-too-successful attempt, to improve the appearance of its original "igloo-type" buildings.

Continued on page 26

Tough Target

Fire globes of tough Tenite Butyrate plastic cut replacement costs for New York City

Here's a good example of how a switch to plastic can improve product performance.

In New York City, orange-colored light globes mounted on nearby poles are used to call attention to the location of fire alarm boxes. However, over the years, vandal breakage of the glass globes had become a growing problem. Four years ago, two of the boroughs found an answer—they switched to globes of Tenite Butyrate plastic. Since then, each broken globe has been replaced with one made of Butyrate. Result: the replacement rate has been cut by as much as 60%. And even this improvement will be bettered in another year when the whole system will have been converted to Butyrate globes.

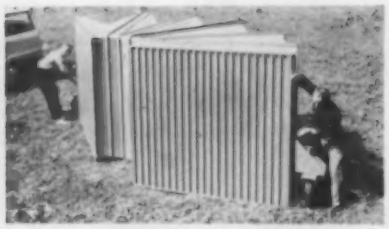
As in so many other applications, Tenite Butyrate supplied a superior combination of the properties needed...high resistance to impact, weather durability, good moldability and excellent light transmission. Of importance, too, the Tenite Color Laboratory developed a color formulation that duplicated the orange hue of the original glass globes.

Perhaps your company has an outdoor material problem that could be solved by a switch to Tenite Butyrate.

Why not investigate this tough, durable plastic? For information, write EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, KINGSPORT, TENN.

TENITE®
BUTYRATE
an Eastman plastic

Fire globes molded of Tenite Butyrate by A. L. Hyde Co., Grenloch, N. J., for The Welsbach Corporation, Philadelphia 2, Pa., which does street lighting maintenance for the City of New York. Commenting on the considerable reduction in replacements since switching to Butyrate, Welsbach's New York City manager says, *"Butyrate's resistance to shock is so great that no replacement is necessary when the globes are pierced by BB shot or even small bullets. They resist damage from small stones, and even large rocks will only tear the Butyrate, leaving the globe in serviceable condition."*



Glass's "Accordium"

Accordion house

If one of the ideals of contemporary architecture is "to bring the outdoors in," the trend in camping-equipment design is to take the conveniences of the indoors out. At any rate, this is the raison d'être of Henry Glass's new "Accordium," a prototype of which was unveiled last month in the Indiana Mobile Home Association's display at the Indiana State Fair.

Designed for Alcoa's "Forecast" collection, the Accordium travels as a trailer on its own wheels and opens up at the camping site, concertina-fashion, to sleep six and provide them with all the essential utensils of living.

Collapsed for trailing, the shelter measures roughly 6½' x 7½' x 4'; fanned open, it provides over 350 cubic feet of sleeping space featuring six wedge-shaped mattresses radiating out from the inner core. The two swing-around panels, which form the "front entrance" of the shelter when in use, contain living conveniences (staples, utensils, and other equipment), a fold-up roof for protection against sun and rain, and a fold-down assembly of table and benches for six persons.

Skeleton of the Accordium consists of seven rigid aluminum rectangular frames each 6½ feet high and 7½ feet wide, fabricated from six-inch extruded aluminum structural channels. The skin is a translucent laminated vinyl-and-nylon mesh membrane whose six sections, each about three feet wide at the periphery, join the seven ribs. At the inner core a waterproof connection joins the aluminum ribs to the plastic walls.

Major design contest

The City of Seattle is sponsoring an international competition for the design of a fountain to be constructed for the Century 21 Exposition of 1962. Under direction of the Seattle Municipal Art Commission, the contest is open to all designers, architects, landscape-architects, and sculptors, for a fountain which "will employ water, illumination, and sculpture form in ways that will represent a departure from traditional fountain design."

Registration for the contest must be made by September 16, 1960 with the Professional Advisor, Seattle Civic Center Fountain Competition, Civic Auditorium, Seattle 9. From the preliminary entries, which must be submitted by November 28, 1960, five final contestants will be selected, each to be awarded $2,000. Each finalist must then prepare working drawings and cost estimates in association with a registered architect. From the five finalists, a winning designer will be awarded a contract with the City of Seattle to complete and supervise the fountain, receiving ten percent of the cost.

The $250,000 project will be completed in time for the opening of the Exposition in April, 1962, and will thereafter become a permanent part of Seattle's Civic Center.

Ceramics-in-Architecture contest

The Everson Museum of Art in Syracuse, New York, announces the fifth competition for the Ceramic Arts as Applied to Architecture, in connection with the 21st Ceramic National to be held November 12, 1960 through January 8, 1961.

Two prizes are offered: the Federal Seaboard Terra Cotta Corporation award ($100) for sculpture, and the William M. Milliken award ($100) for enamels designed as an integral part of an architectural project. Work in progress or completed within the past three years is eligible.

Entries must consist of a photographic record, including 2 x 2 transparencies, of finished installations or commissioned work in progress. Scale should be indicated. Deadline is September 1st. Entry blanks are available from: Everson Museum of Art, Syracuse 3, New York.

Compact extension telephone

A new compact extension telephone was marketed to the independent telephone industry last month by the Stromberg-Carlson division of General Dynamics. Available in white, beige, pink, blue, and turquoise, the new "Petite" (top, right) gets compactness by eliminating the ringer (a separate wall-mounted ringer is available) and by reductions in size of about 30 percent in the hookswitch and network assemblies.

Stromberg "Petite"

Made of Marbon "Cycolac" (an ABS plastic), with bright parts in aluminum and chrome, the new phone is about half the weight of a standard set and features a smaller, illuminated dial with the numbers and letters inside the fingerwheel. The nightlight automatically glows brighter when the handset is lifted from the cradle. To help prevent slippage in use, the base is padded with waffle-rubber and the retractable cord is said to have a "softer pull."

Design of the base and hand-set is the same as Henry Dreyfuss's design for a similar extension unit which the Bell Telephone System will put on the market later this year.

Four trade shows

What is being advertised as the largest collection of new American and foreign high fidelity and stereophonic sound reproduction components ever assembled under one roof will be assembled under the roof of the New York Trade Show Building next month at the 1960 High Fidelity Show. Sponsored by the Institute of High Fidelity Manufacturers, the show will run September 7-11, and is expected to play $6 million worth of the latest home and professional equipment to an expected audience of over 40,000 visitors.

The quinquennial Machine Tool and Production Engineering shows will be held September 6-16 in Chicago (Amphitheatre and Navy Pier, respectively). All sorts of control equipment, machine components, auxiliary equipment and supplies, intra-plant communications gear, safety and materials handling equipment, and inspection, gaging, and testing equipment will be on view at the Production Engineering Show.

Consumers will be urged to "Try Before You Buy" at the first annual Electrical Living Show scheduled for the New York Coliseum September 10-18. All kinds of appliances will be shown.

An international exhibition of ceramics will be held in Vicenza, Italy, from September 8-18. Featured at the exhibition will be an international display of ceramic products "whose technical and esthetic qualities are the result of effective cooperation between manufacturers and industrial designers."

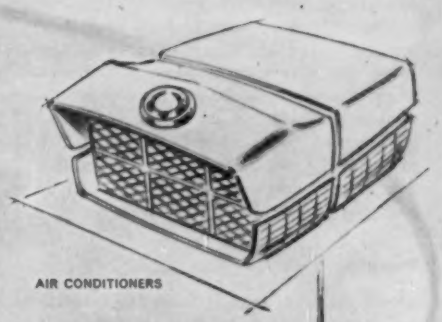
Continued on page 28

Idea!

. . . a world of inspiration

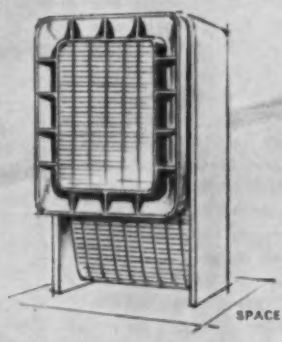
with H&K perforated metals

TAPE RECORDERS



AIR CONDITIONERS

LIGHTING FIXTURES



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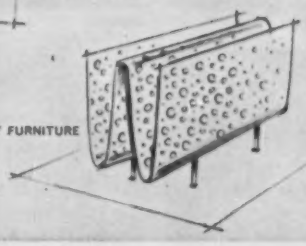
Metallic materials include steel, aluminum, stainless steel, brass, copper, monel, zinc, bronze, etc.

Non-Metallic materials include plastic, wood, composition, paper, cloth, etc.

TELEVISION, HI-FI AND RADIO SETS

OFFICE FURNITURE AND EQUIPMENT



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For more than 75 years, Harrington & King has helped to broaden the horizons of industrial design through the imaginative creation of exciting perforated patterns in both metallic and non-metallic materials.

Whether for functional or decorative use—or both! — the appropriate motif for almost every application is available from our vast selection of existing dies . . . at no charge for tooling. Or, if necessary, tools for special designs will be made to order.

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☐ GENERAL CATALOG No. 75

☐ STOCK LIST of Perforated Steel Sheets

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Just a few of the many H&K patterns are illustrated—in reduced size.

Package design workshop

Pratt Institute's third annual package design workshop will begin September 20th and continue for 15 consecutive Tuesday evenings. Director of the course will be package designer Robert I. Goldberg, a director of Associated Industrial Designers, New York.

The workshop, open to both beginning and advanced artists, will combine lectures and demonstrations on the design of sales-winning packages. Several prominent manufacturers of drug, food, and housewares products will present case histories for students to analyze, and a complete package design project will be required to complete the course.

People

APPOINTMENTS: **John D. Ross** as executive secretary of the Committee on Design of the New York World's Fair. The Committee already includes: designer Henry Dreyfuss, engineer Emil Praeger, and architects Wallace K. Harrison, Gordon Bunshaft, and Edward D. Stone. . . . New York attorney **J. Anthony Panuch** as overseer of industrial exhibits for the New York World's Fair. . . . **Joseph A. Maxwell** (below) and **Alex Martin** (below, as associates at Sundberg-Ferar, Inc. . . . **David R. Campbell**, president of the American Craftsmen's Council, as Director of the Museum of Contemporary Crafts. . . . **Peter Tasi** as staff designer in the Design and Construction Division of the U. S. Office of International Trade Fairs. . . . **J. R. Bradley** (below) as design consultant for General Electric Textolite. . . . **Dr. Edward W. Cundiff** (below) as consulting associate in marketing and research at Warren Furlonge Associates. . . . **Joseph M. Murtha** as vice-president in charge of account supervision, and **Henry C. L. Johnson** as assistant to the president of Lippincott & Margulies. . . . **Henry N. Rowley, Jr.** as sales manager of Richard Arbib Company. . . . **John Aapner** as vice president in charge of marketing at Jens Risom Design, Inc. . . .**Henry Dreyfuss** as Chairman of the Board of Design of the projected Los Angeles Music Center. . . . **John Dymock Entenza**, publisher of *Arts and Architecture* since 1938, as director of the Graham Foundation for Advanced Studies in the Fine Arts in Chicago.

RETIRED: **Julian Everett** on July 1st, after 26 years with Henry Dreyfuss, to pursue his own outside interests.

RESIGNED: **A. Baker Barnhart** from his partnership in Raymond Loewy Associates.

ASSIGNED: **Saul Nesbitt**, director of Nesbitt Associates, to conduct a formal program of package design education for Olin Mathieson Chemical Corporation salesmen. The program has been set up to give Olin's Packaging Division customers "more effective assistance in developing packages adapted to specific marketing objectives." Nesbitt, who is Olin's own packaging consultant, plans to give a series of lectures to district salesmen and to issue brief monthly papers which at the end of a year will constitute a salesman's "primer" in the essentials of package design.

HONORED: Color consultant **Howard Ketcham** (below) by his alma mater Amherst College, with an honorary Master of Science degree. . . . **Ladislav Sutnar** by the International Institute of Arts and Sciences, with election as Fellow of the Institute. . . . American Craftsmen's Council board chairlady **Mrs. Vanderbilt Webb** by the California College of Arts and Crafts, with an honorary degree of Doctor of Fine Arts. . . . Art Institute of Chicago industrial design student **George Weir** (below) by Joseph Palma, Jr. and J. Gordon Knapp, with the annual Palma-Knapp scholarship.

Company News

ESTABLISHED: **Van Christo Associates**, industrial design, at 330 Stuart St., Boston. . . . **Irene Pasinski**, industrial design, at 709 Bellefonte St., Pittsburgh. . . . **Philip J. deCarolis**, exhibition and industrial design, at Sukon, Inc., 917 Third Ave., N. Y. . . . **Leonard Albrecht** (below) **Associates**, industrial design, at 1100 Sansome St., San Francisco.

EXPANDING: **Latham-Tyler-Jensen**, with a West Coast office opened July 5th under the direction of **Donald L. McFarland** (below) . . . **Jens Risom Design, Inc.**, with a new showroom at 144 N. Robertson Blvd., Los Angeles. . . . **William M. Schmidt Associates**, at the old Detroit address, with additions that double the size of their former facilities.

RETAINED: **Harper Landell & Associates**, by Bendix Home Appliances (Paris) and American Machine and Foundry Co. . . . **William M. Schmidt Associates** by Michigan Brass Co., Holland Die Casting Co., and Lux Clock Manufacturing Co. . . . **Van Christo Associates** by Stepless Controls Corp. . . . **Leon Wirch Associates** by Trans-World Displays. . . . **Fred M. Gore** by Mooney Aircraft. . . . **Charles Butler Associates** by Canadair Ltd., a division of General Dynamics; Canadian Pacific Airlines (for a corporate identity program); Chance & Associates (for a line of fiberglass cruisers); and British Aircraft Corp. (a recent merger of Vickers, Bristol, and English Electric). . . . **Associated Designers Incorporated** by Great Eastern Mills, Inc., for a 24,000-square-foot supermarket in Elmont, N. Y. . . . **Goertz Industrial Design** by Polaroid Corp. . . . **Monte L. Levin** by Kaz, Inc., Pittsburgh-Corning Corp., Raytheon Co., Singer Manufacturing Co., Welbilt Corp.

Events

The design workshop, "Designing with New Materials, Methods, and Processes," to be held by the **Design Division** of Boston's Institute of Contemporary Arts, September 7-17, will be directed by Richard Reinhardt, Assistant Director of the Industrial Design Department of the Philadelphia Museum College of Art. Lectures and demonstrations will be offered by the following companies: Aluminium Ltd., Alcoa, Armco Steel, Corning Glass Works, Fine Hardwoods Assn., Hercules Powder Co., Monsanto Chemical Co., Owens-Corning Fiberglas Corp., Park Nameplate Co., Rohm & Haas Co., and U.S. Gypsum Corp.

Robert H. Asken, Director of Packaging and Graphics for Raymond Loewy Associates, Chicago, was killed in a helicopter crash in Chicago on July 27th.


Maxwell


Martin


Bradley


Cundiff

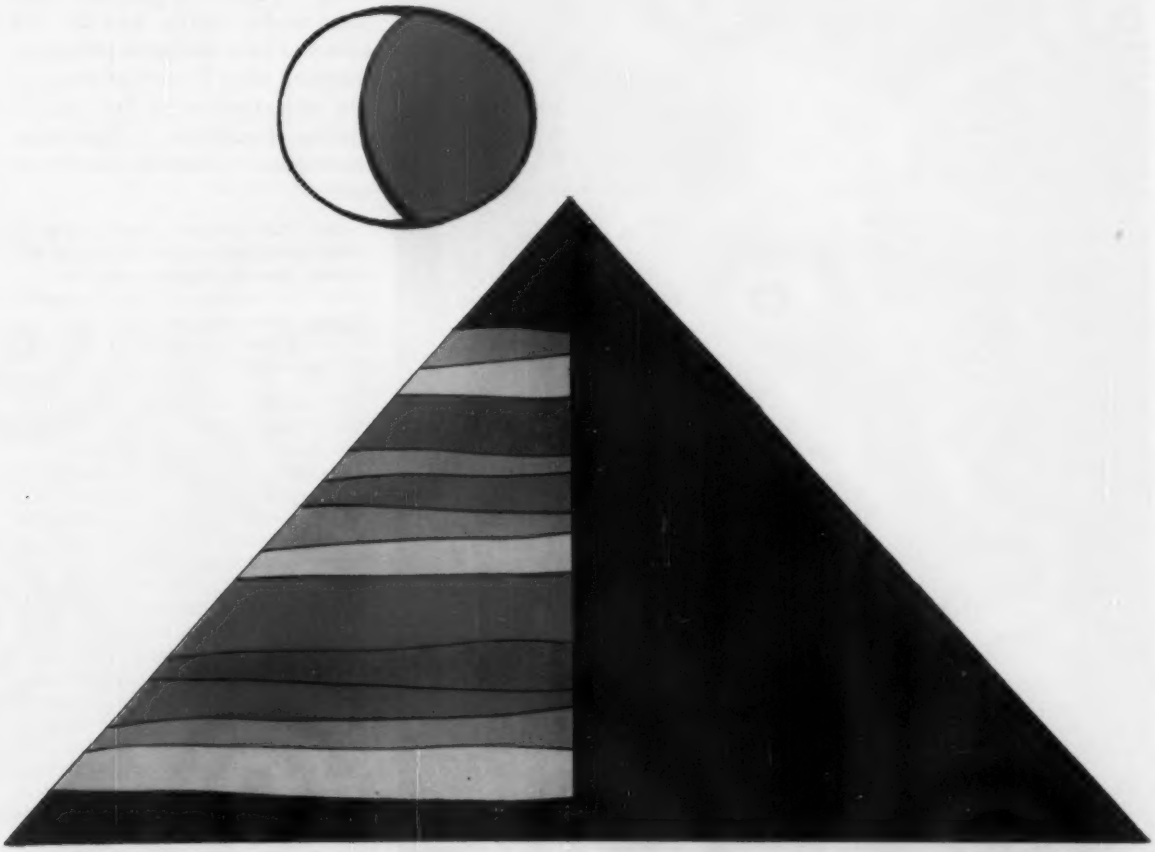

Ketcham


Albrecht


McFarland


Weir

You'll put permanence into products with Western Brass because brass is tough to start with... because time, use and environmental attack only mellow it. But whether you use brass for strength or appeal, your product calls for an individual alloy, temper, gauge and finish. Count on Western Brass to recommend and produce exactly the right one. (It will even arrive in boxes specially adapted to your handling methods.) You'll make it better with durable brass. You'll make it best with "tailor-made" Western Brass.



OLIN MATHIESON • METALS DIVISION • EAST ALTON, ILL., NEW HAVEN, CONN.

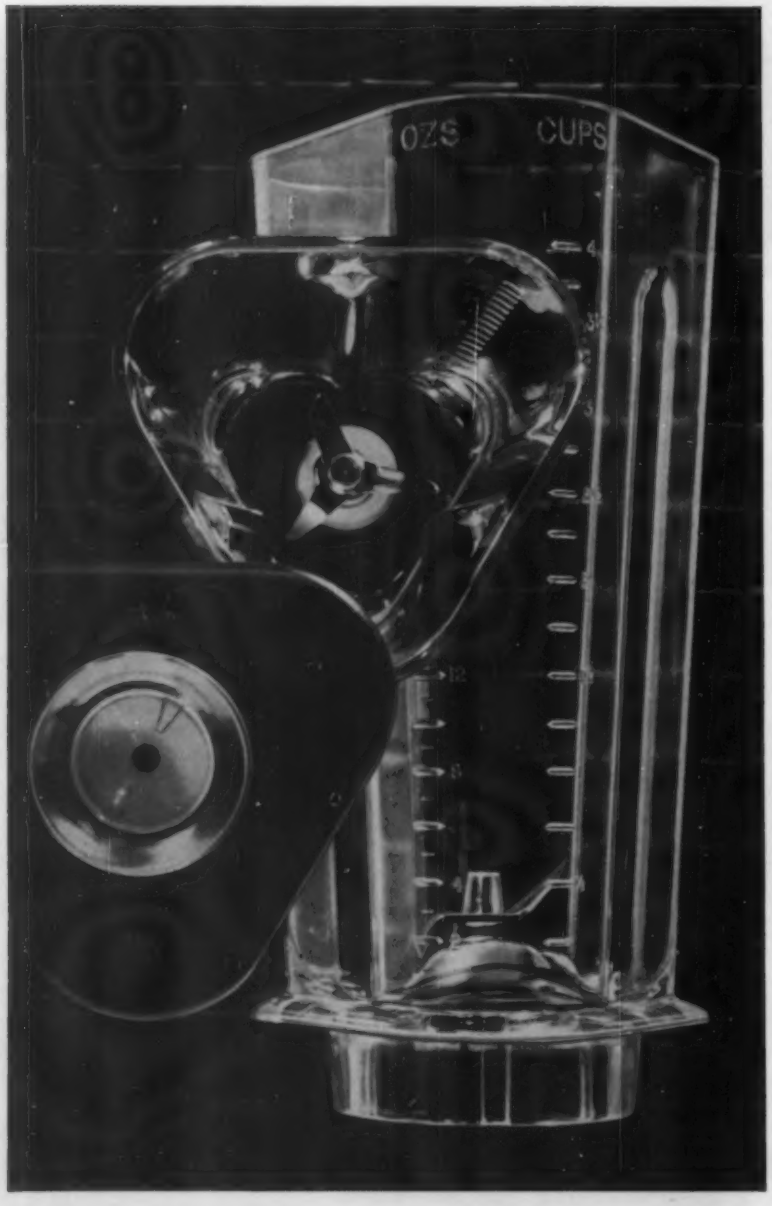
Western BRASS

DOW

NEWS ABOUT PRODUCT DESIGN AND MATERIALS

From the technical development laboratories at Dow comes a steady stream of new applications for those versatile materials—the thermoplastics . . . new applications that accent beauty, function, production economy . . . new applications that stimulate ideas for your own designs and processes. The products described on these pages contain just a few of the Dow thermoplastics that are serving today's designers . . .

ON DISPLAY OR UNDER COVER . . . PLASTICS DRAMATIZE MODERN DESIGN



Some plastics are meant to be seen . . . others to perform their jobs under cover. But all are selected by a designer primarily because they fit one or more of his requirements for moldability, durability . . . lightness, inertness . . . beauty, clarity, or color.

One Dow thermoplastic—Tyril®—adds materially to the design of this modern built-in blender – the latest in handy time-savers for the housewife. Mixing, chopping, or liquefying in a matter of seconds, are just a few of its accomplishments.

To combine a rugged performance with pleasing design, the designer specified clear Tyril for the blending jar. Tyril—a Dow copolymer of styrene and acrylonitrile—gives this appliance part the toughness, chemical and temperature resistance to take all kinds of kitchen punishment.

For this molded piece the designer needed a plastic material that would faithfully reproduce the complex, functional shape, and the finely detailed cup and ounce measuring marks on the sides. Tyril did the job, accurately, economically and with a minimum of finishing operations afterward.

An undercover thermoplastic that nevertheless makes its presence felt in design circles is Pelaspan® – Dow expandable polystyrene in bead or pellet form. At one time, to insulate a product, designers were forced to adapt the shape of the product to include the added bulk and weight of the insulation. Today, designers have solved this problem with Pelaspan. Foamed in place by the manufacturer, Pelaspan provides thermal insulation with minimal bulk and weight for an attractive beverage cooler, opposite.

For sales appeal to the recreation market, here is a trio of Dow thermoplastics that lend their specific talents to

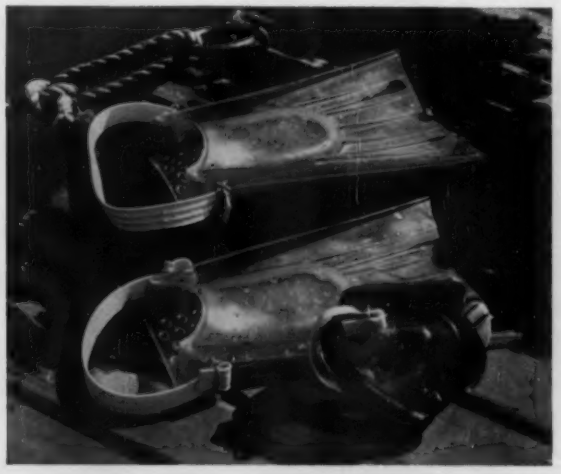
a fishing tackle box, a fishing reel, and an underwater mask and swim fin outfit . . .

Boasting an attractive design – both physically and functionally–the tackle box is molded of economical Styron® 480, a Dow super-high-impact plastic formulation with a green and white marbleized color effect. In addition to its inherent toughness and heat resistance, the excellent molding characteristics of Styron 480 – with special emphasis on flow characteristics–allow the molder to produce a unique tongue and groove design along the edge. This makes the box watertight when closed – even allows it to float!

A colorful, economical solution to a design problem, this casting reel includes tough Styron 475 in the end caps and knobs. This polystyrene formulation gives high impact strength, and good chemical resistance. Its excellent molding characteristics enable the molder to reproduce fine details in a variety of colors.

Molded of an easy-to-process resin, an underwater face mask and swim fins of Dow PVC will last far longer than conventional materials. PVC permits the mask to fit snugly and comfortably across the face of the swimmer, with a sealing lip around the edges to prevent water seepage.

The PVC swim fins are lighter and stronger than the ordinary fins. What's more, the sun will not fade or rot PVC. Dow PVC is available in a wide selection of formulations, permitting designers and manufacturers to meet almost any design, color, process, or use requirements.



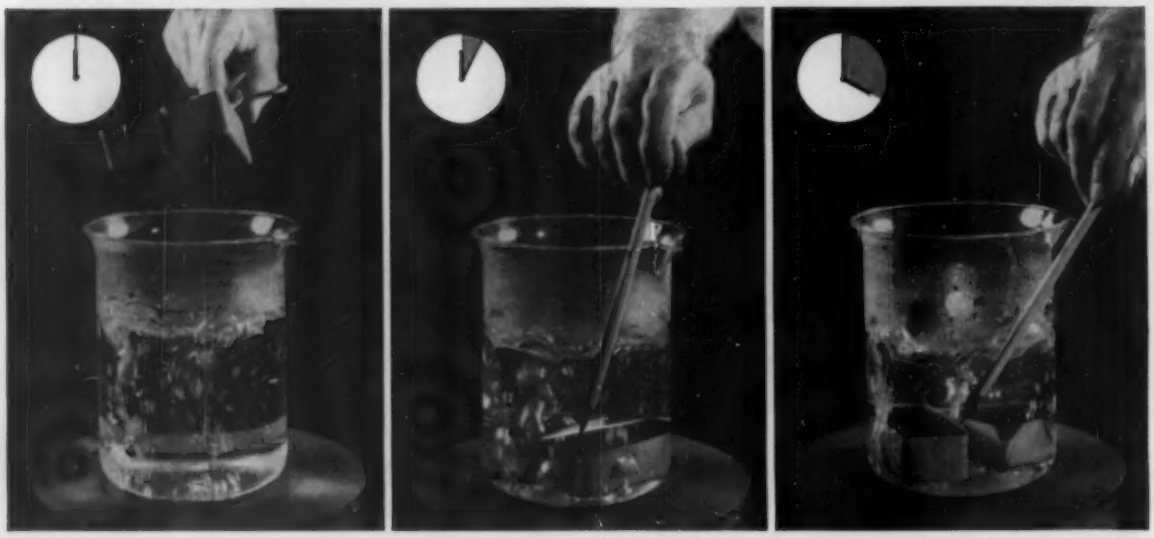
PROBLEMS, ANYONE? If a design or processing problem is puzzling you, chances are there's a formulation within the Dow Family of Thermoplastics that will solve it. If we can be of any assistance in helping you select the right formulation to fit your design, or in color styling, etc., please write us. THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Merchandising Department 1717BR8.

THE DOW CHEMICAL COMPANY

Midland, Michigan

DOW

A DRAMATIC DEMONSTRATION OF THE NEW CLAD-REX 102 LAMINATE



Boiling water provides a positive test for two deep drawn* vinyl-clad parts. Neither special care in forming, nor post curing has been used to prepare either part.

Almost within a matter of seconds, the part formed of conventional vinyl-clad metal (at right) begins delaminating at the corners.

Even after as long as four hours of boiling, the part formed of new Clad-Rex 102 laminate (at left) still shows no delamination whatsoever.

New Clad-Rex vinyl-clad metal sharply reduces limitations in deep drawing and heat exposure

Has your interest in vinyl-clad metals been cooled because your product is deep drawn? . . . or because your product is exposed to elevated temperatures? . . .

Now, you can solve the problem with new Clad-Rex 102. It's a new vinyl-metal laminate that is, in effect, a single element of material. Clad-Rex 102 combines *for the first time* the ultimate properties of sheet metal with the optimum characteristics of vinyl.

Call or write for facts of this major technological breakthrough by the extensive research laboratories of Simoniz Company.

*Depth of draw equal to six times radius of corner

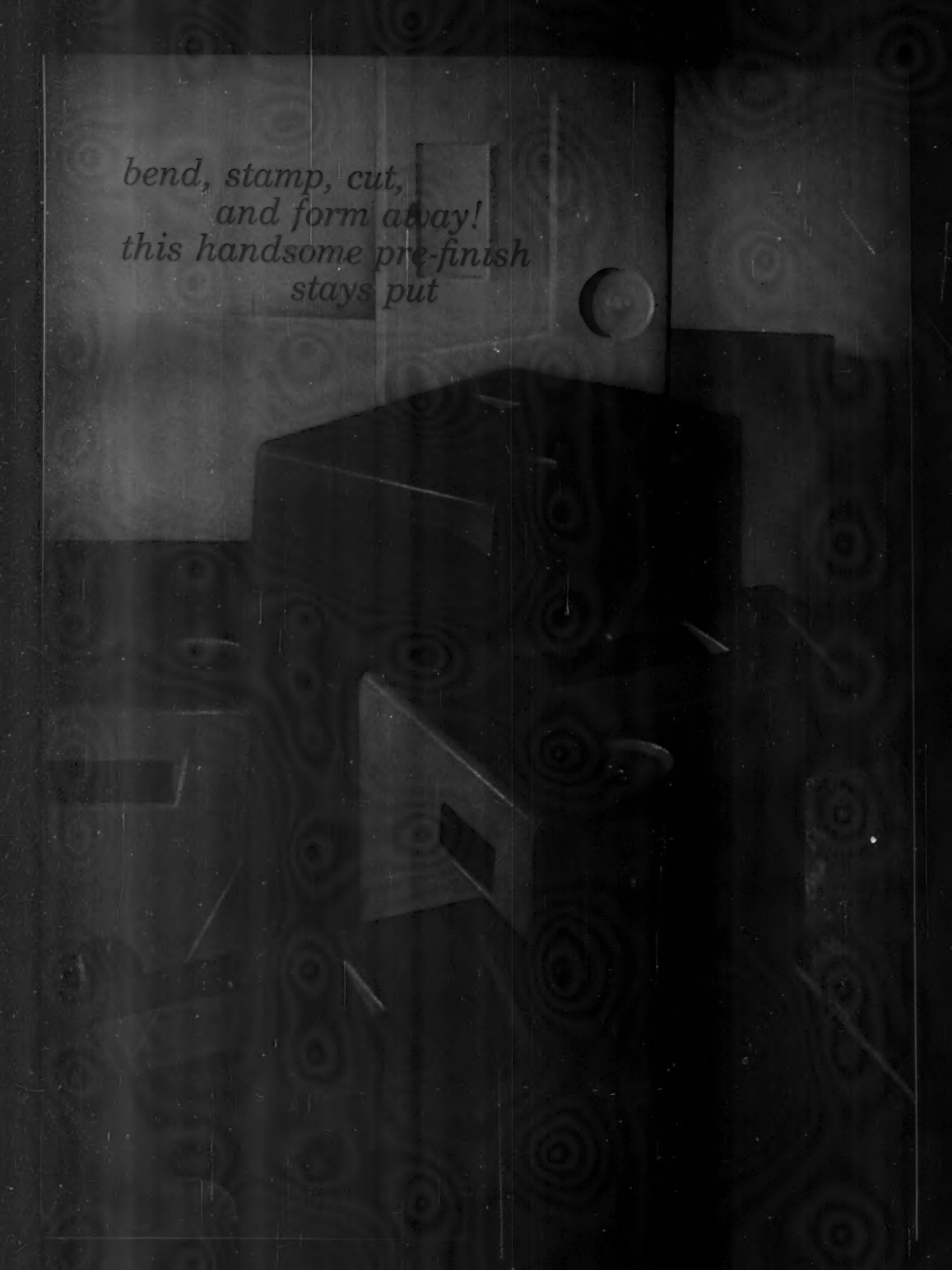
VINYL-METAL LAMINATES BY **CLAD-REX**® DIVISION OF SIMONIZ COMPANY

11510 W. King Street • Franklin Park, Illinois

Telephone: GLadstone 1-2323

Herman Miller's Steelframe Case Series: frames of steel in black or white with hard plastic tops, drawers and sliding doors in a choice of four color combinations. These pieces are sturdily constructed yet light in scale... they are well suited to a variety of storage applications.

HARPER


bend, stamp, cut,
and form away!
this handsome pre-finish
stays put

VINYL-ON-METAL is cooperative. Stamp it out. Punch it out. Even weld it! Form it the same ways you form unfinished sheets. The unique colors, textures and patterns of Vinyl-on-Metal sheeting or coils remain unaffected. The tough resilient surface stays—won't chip or peel in use. It protects against tearing or wrinkling—minimizes surface damage during fabrication and assembly. Vinyl-on-Metal is already widely and successfully used for furniture appliances, transportation interiors, building construction, and in many other fields. For a highly informative booklet, "Vinyl-on-Metal," write to Monsanto Chemical Company, Plastics Division, Room 753, Springfield 2, Mass.

Monsanto developed and today supplies Opalon® and Ultron® vinyls for superior finishes on steel, aluminum, and other metals, and on wood, paper and glass.

MONSANTO DEVELOPER IN **PLASTICS**

Monsanto

Coming in December

INDUSTRIAL DESIGN'S

7th ANNUAL DESIGN REVIEW

Designers and manufacturers are invited to submit entries now for INDUSTRIAL DESIGN'S seventh Annual Design Review, a portfolio of the year's major innovations in product design, packaging, materials, professional and industrial equipment, architectural components, designs for selling and corporate identity. Coming in December, this comprehensive review of the most noteworthy design achievements of 1960 *will be, as previous ADR issues have been, a valuable permanent reference for everyone concerned with design for industry. It will feature*

1. *inventive designs: solutions based on new functional improvements*
2. *notable solutions to familiar problems*
3. *designs without prototypes: solutions to new and unique problems*
4. *engineering developments*
5. *apt and unusual use of materials, components, finishes*
6. *new design ideas for merchandising*
7. *innovations in product form*

and many more categories of selection.

Here's how you can participate:

From designs placed on the market since September, 1959, choose those which you believe represent the most significant work of your firm or design office. Send us one or more unretouched photos of each product, labeling each photograph clearly with the names of the product, the designer, staff member, or department in charge, and the manufacturer and suppliers. **On the same label please include a brief note stating where we can see the product you selected, what you consider is unique and distinguished about it, and in what respects you regard the use of materials, components and manufacturing techniques as unusual.**

Closing date is September 15, 1960.

All ADR material should be addressed to: Deborah Allen, Consultant Editor, Annual Design Review

INDUSTRIAL DESIGN *18 E. 50th Street, New York 22, N. Y.*

Double-Layer Nickel Plating... bright, new way to give a product lasting sales appeal

Long will her trim stay bright and shiny! For under that mirror-like top coat of chrome on the 1960 Dodge there's a double layer of Nickel Plating.

The first is a heavy layer of semi-bright Nickel – to provide a leveling base, a smooth metal foundation. The second is a fully bright layer to provide the lustrous base needed for a gleaming chrome finish.

It's the double layer of Nickel that actually makes possible the lasting brilliance of the finish. You see, double-layer Nickel Plating works two ways: It acts as a *cushion* against nicks, scratches and abrasions. What's more, it *shields* the basis metal against rust and corrosion.

It's truly "The Finish of Lasting Beauty." So rich and lustrous, it's bound to earn an appreciative nod from the prospective buyer . . . so durable and practical, it keeps untarnished a manufacturer's reputation for quality.

With Nickel in ample supply, now is the time for you to look into the advantages of double-layer Nickel Plating. Plan to recommend and use this quality finish whenever a durable and attractive finish is needed.

For information on corrosion testing of plated coatings and how it can help assure the quality of Nickel-Chrome finishes, write for our booklet, "Corrosion Testing of Electrodeposited Coatings." It's yours for the asking.

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.

INCO **Inco Nickel**... *makes plating perform better longer*

No miracle in Milan

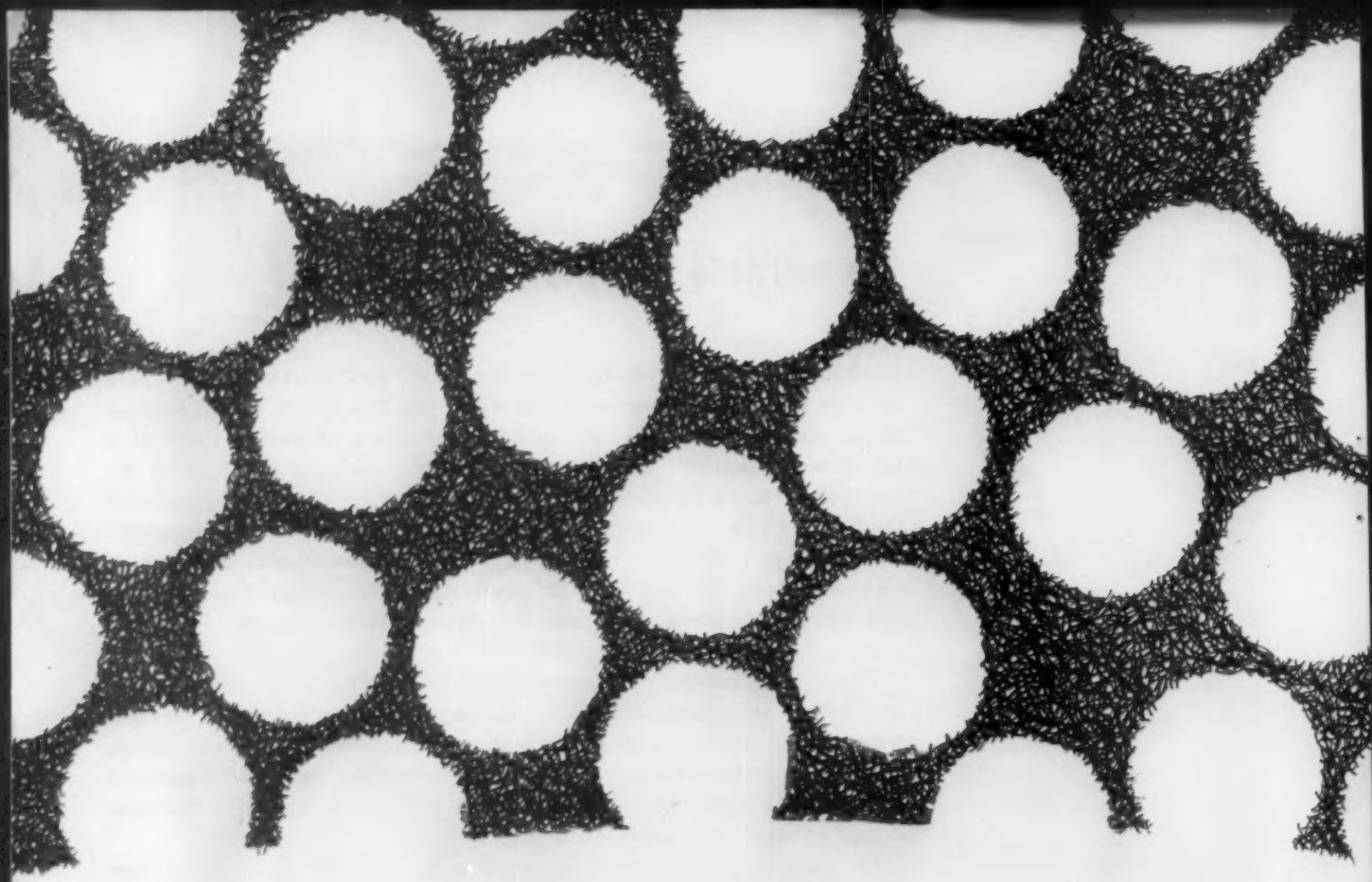
Recently a man named Daniel Lewis flew from San Francisco to New York in order to place a full-page ad in the *New York Times*. The ad, in the form of an open memorandum to Vice-President Nixon, described itself as a "proposal for *action*." The italics belong to Mr. Lewis, who argues for the establishment of a Federal agency, of cabinet status, "to come to grips with the Soviet Union on its own field of battle — and with its own weapons." What Mr. Lewis means by "*action*" can be seen in his insistence that such an agency be staffed by "men who think in terms of slogans, men who can write, and men who understand the basic principles of propaganda and mass persuasion."

We have nothing against men who can write, but we have always distrusted men who think in terms of slogans. We suspect them of being well on their way towards losing the ability to distinguish between phrase and action, between platform and policy. As a matter of plain fact, our Federal agencies have never been without men who think in terms of slogans. The challenge is to show what the slogans mean.

Our national distaste for accepting this challenge is obvious: once again the United States has officially failed to rise to the occasion of the Triennale at Milan (see page 74). In 1957, the time of the last Triennale, there was at least a reluctant gesture of good intentions. At the very last minute, the United States Information Agency promised, and the Department of Commerce actually gave, enough money to make possible a hastily prepared (but astonishingly effective) exhibit. But the design profession in America was unable to make a unified effort to persuade its government that American representation at the present Triennale, which opened in July, was an investment worth making. Such representation as we have is the result of charity, generous if not wholly altruistic. Alcoa provided, and shipped at its own expense, a prefabricated house furnished, under Walter Dorwin Teague's direction, with items donated by American manufacturers. This is something, but not enough.

Why *should* the State Department, or any Government agency, spend the nation's money at the Triennale? Because this major international design show is competitive, and our outstanding participation would have immense propaganda value — the propaganda value that comes from displaying excellence rather than from claiming perfection. That is not the best reason, or even a very good one, but it is the most pointed; and every designer has had the experience of persuading a client to do the right thing for the wrong reasons.

Of course we are prone to consider design events much more important than they really are. The Triennale is, after all, only a fair. In our most secret hearts we know that U. S. participation in Milan would not in itself preserve the free world, or win the cold war, or capture the loyalty of uncommitted nations. But it might make the point that we are a nation that does a lot of things well, and that we have a government that knows this and takes pride in it. It is a point no sloganeer could make as convincingly. — *R.S.C.*

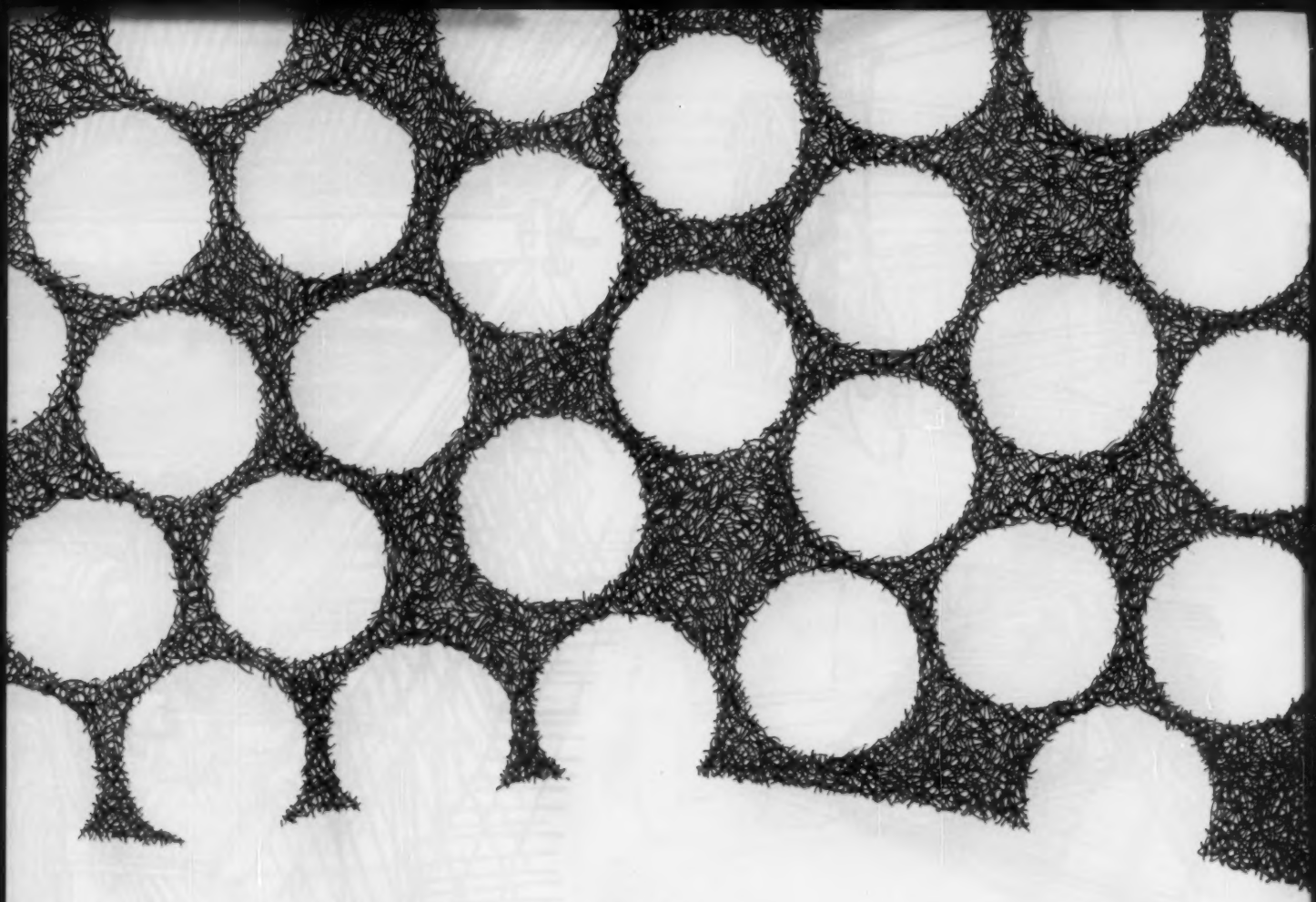


Wool Felt

The eighth installment in ID's

One of the oldest man-made materials is one of the most pervasive —if inconspicuous — ingredients in thousands of modern industrial products. Wool felt is essential to pianos, is superior to "miracle" materials for sound reproduction in hi-fi receivers, is an important element in gas masks, and forms the entirety of such disparate products as ukulele picks and artificial limbs (some grades of felt have a firmness comparable to that of human muscle). In the automobile alone, felt is used in scores of ways — as a seal against oil, dust, and weather, as a filter for oil, and as a wick for lubricating the generator. Responsible for the variety of these industrial applications is a unique assortment of properties that includes resiliency, durability, and a gradation of densities from soft to rock-hard. And since it does not ravel when cut, regardless of the angle, it can be easily fabricated into a variety of permanent shapes without the necessity for internal or external support.

The art of making felt was developed thousands of years ago. Felt caps that date back to the early Bronze Age have been discovered in northern Europe. One of Caesar's armies was equipped with felt breastplates. And workshops that specialized in the production of felt hats and gloves have been unearthed in the ruins of Pompeii.



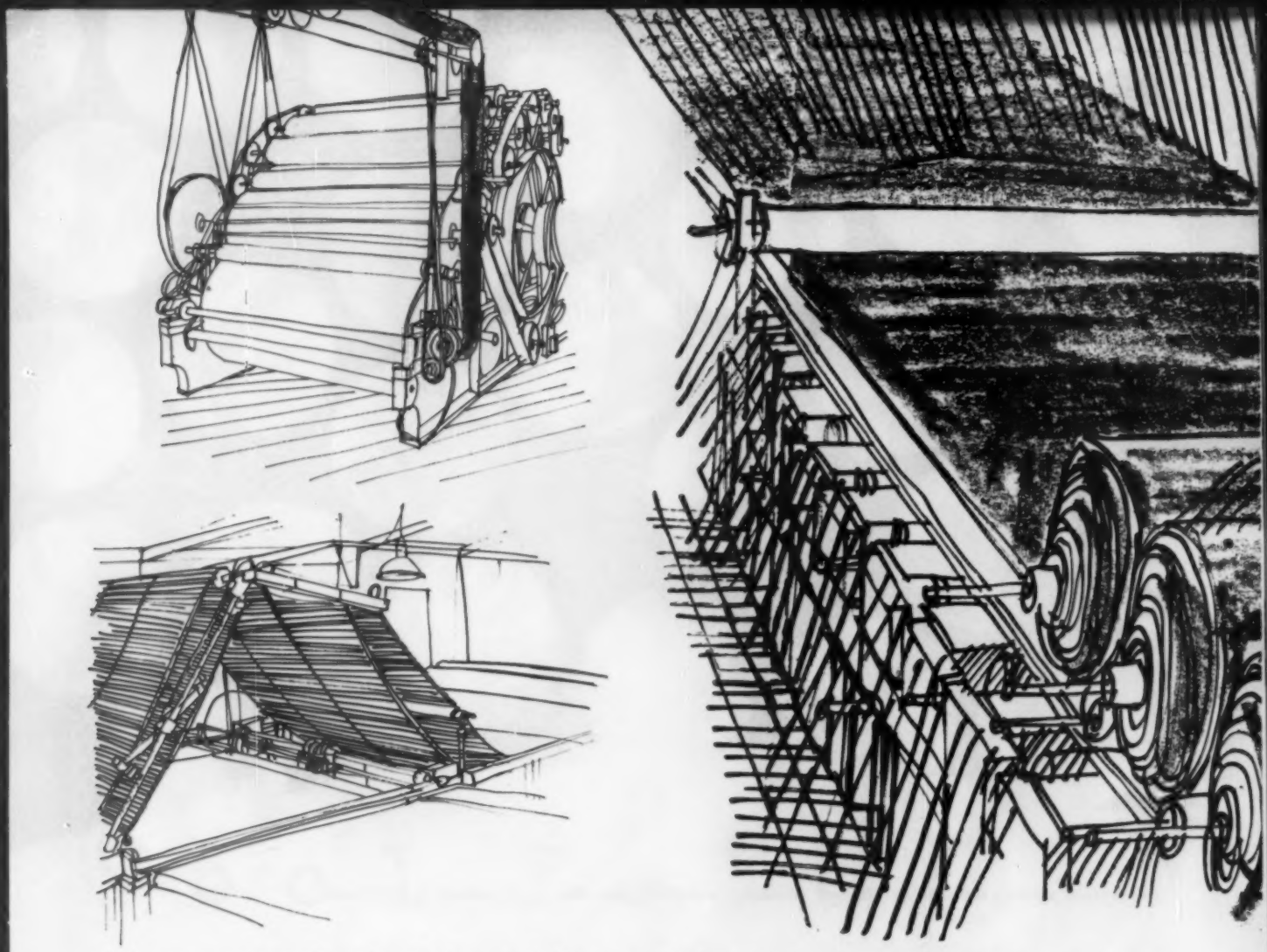
fabrication series examines an old and versatile industrial material. by LESLIE D. GOTTLIEB

The East, too, has furnished evidence of early felt-making. Chinese historical records note that warriors used felt shields, clothes, and hats. The Mongols still use mound-shaped, portable felt tents known as "yurts."

Today's felt-making industry consists of approximately ten manufacturers that together consume about 30 million pounds of fiber annually. In 1959, the largest of them had slightly more than 13½ million dollars in sales.

Reflecting the highly technical nature of our culture, the present day applications of the material are, for the most part, mechanical. They may be grouped under seven distinct functions (although in many cases the same product performs more than one task): friction, insulation, spacing, sealing, cushioning, filtration, and wicking. Behind each function lies an extensive laboratory investigation and analysis. As a result, wool felt's applications have been expanded, its properties have been improved by blending of selected fibers and supplementary finishing treatments, and special production techniques have been established to permit it to meet exact engineering standards and specifications..

However, in contrast to its behind-the-scenes role in engineered products, one



of the newest applications of wool felt is one of its least mechanical and most obvious — wall coverings made from the material are being used more and more frequently in private residences, restaurants, hotels, and office buildings. Yet for all its diversity, wool felt is rarely given much attention as a design material.

What is felt?

Felt is a fabric built up through the interlocking of fibers by a combination of heat, moisture, and pressure, without spinning, weaving, or knitting. Of all fibers, only sheep's wool possesses the natural characteristics that permit it to "felt" well without the addition of foreign substances. Other fibers, such as hair or fur, require special chemical processing before they can be felted.

In the virgin wool fiber, the inner cortex is supported in a stretched condition by a rigid outer shell; it might be compared to a stretched rubber band coated with a stiffener. To convert the fibers into a felt, they are pounded and worked in the presence of heat, moisture, and certain chemical agents. This softens the outer shell and releases the inner cortex which contracts lengthwise. But instead of contracting in a straight line, the fiber grimps, curls, and shrinks.

Another reaction is caused by the presence of scales situated one above the other along the longitudinal axis of the fiber. As the fibers are hammered in the felting process, each of them is propelled root first because the scales offer less resistance to movement in this direction. Consequently, groups of fibers migrate in a multitude of directions. The shrinking and entanglement of these fibers produces a very tight, dense, nonwoven material—felt—which is held together by the friction resulting from the way they are hooked and curled around each other.

The properties of wool felt are the properties of its constituent fibers. Since wool fibers are natural springs, wool felt is a very resilient material. When placed under a load, it does not crumble or flow, and when the load is removed, it exhibits a rapid and high degree of recovery. And, since it is unaffected by normal atmospheric conditions, it is likely to have a long life. Temperatures up to 212 degrees F. do not change it, and its properties are the same at minus 60 degrees F. as at a normal 74 degrees F. It does not deteriorate in the presence of oils, greases, or organic solvents, does not conduct electricity, and does not support combustion. Its fibrous construc-

Some of the basic processes in the manufacture of wool felt are illustrated here. The carding operation, left page top, draws the fibers into parallel. Alternate fiber webs, left page bottom, are crossed diagonally to impart transverse strength. The hardening operation, center, consolidates the webs. Fulling, below, controls shrinkage.

tion makes it a good wicking, thermal insulating, sound absorbing, and filtering medium. Many of its other properties—hardness, wear resistance, and splitting resistance—are directly proportional to its density, and can be controlled in the manufacturing process.

Treatments and blends

In order to extend wool felt's operational capabilities, particularly under high temperature and high strength conditions, the industry's engineers have developed special treatments such as impregnation, lamination, and bonded coating. For various other applications, new blends utilize other vegetable, animal, or synthetic fibers.

Many materials are used for impregnations: starch imparts stiffness to thin-walled parts like coat fronts and hat brims; natural and synthetic rubbers improve flexibility and increase strength in the presence of moisture; powdered graphite offers low frictional characteristics for certain seals; various resins hold it in the proper shape for molding; and other materials provide resistance to fire, water, fungi, vermin, and moths.

Hycar and Neoprene are laminated onto felt for applications such as oil and water seals, and in situations where it is necessary to increase tensile strength. When using laminated seals, there are a number of lubrication possibilities: the laminate can be applied to one side, or both sides, or between layers of felt. Different types of felt can be used on opposite sides of a laminate; for example, certain types of seals employ an absorptive felt for an oil reservoir and a hard felt for a protective shield. Felt can be joined with adhesives to all sorts of materials—plastics, metals, cork, wood, leather, and paper. Coatings include latex rubber and starch sizing which are often used on typewriter pads and chair pads to provide non-skid reinforcement.

A substantial number of applications require a composition that includes other types of fibers besides wool. Cotton is used in wool felt to decrease density and to impart a soft, smooth texture. To obtain a lightweight thermal and acoustical insulation material, kapok is added. For industrial polishing and cold pipe insulation, goat and cattle hair are used. The wool itself is also blended by combining different grades and varieties. All these combinations are made possible by wool's great felting ability —a composition with only 20 per cent wool content will still felt.

Synthetic felts

In recent years, a great deal of research has gone into the development of felts made entirely from synthetic fibers such as Orlon, Dacron, Nylon, Acrilan, Dynel, and Arnel. The high resistance of these materials to chemical action, and the fact that they may be used at higher temperatures (up to 300 degrees F.) than wool felts has made them more and more important. Their properties include all

Both the automobile and the piano use numerous felt parts, a sampling of which are shown below. In the automobile, felt is used for everything from lubrication to weather-stripping. In the piano, it hammers the strings, checks parasite vibrations, damps the sound, and supports, guides, and cushions many parts of the action.

those of the synthetic fibers from which they are made: high abrasive wear resistance, excellent electrical characteristics, and resistance to biological damage or attack. Rather than replacing wool felt, however, the synthetics are opening up new fields, especially where high temperature and high abrasive wear is a factor. They are being used as bearing seals and lubrication wicks in high-energy electric motors, reinforcements for plastic laminates in radome housings, filtration units in air conditioners and vacuum cleaners, and instrument and vibration isolation in missiles.

One of the most promising of the synthetic group is a Dacron felt impregnated with Teflon that is used for gaskets, strips, and washers in electrical equipment. Highly stable under corrosive conditions, this synthetic operates at 420 degrees F., and has a tensile strength of 1000 psi at that temperature.

Besides differing from the wool felts in composition, the synthetic fibers differ in their manufacture because synthetic fibers have no felting abilities of their own. They must be either felted mechanically by driving a needle through a mat of fibers to interlace them, or by bonding under heat and pressure.

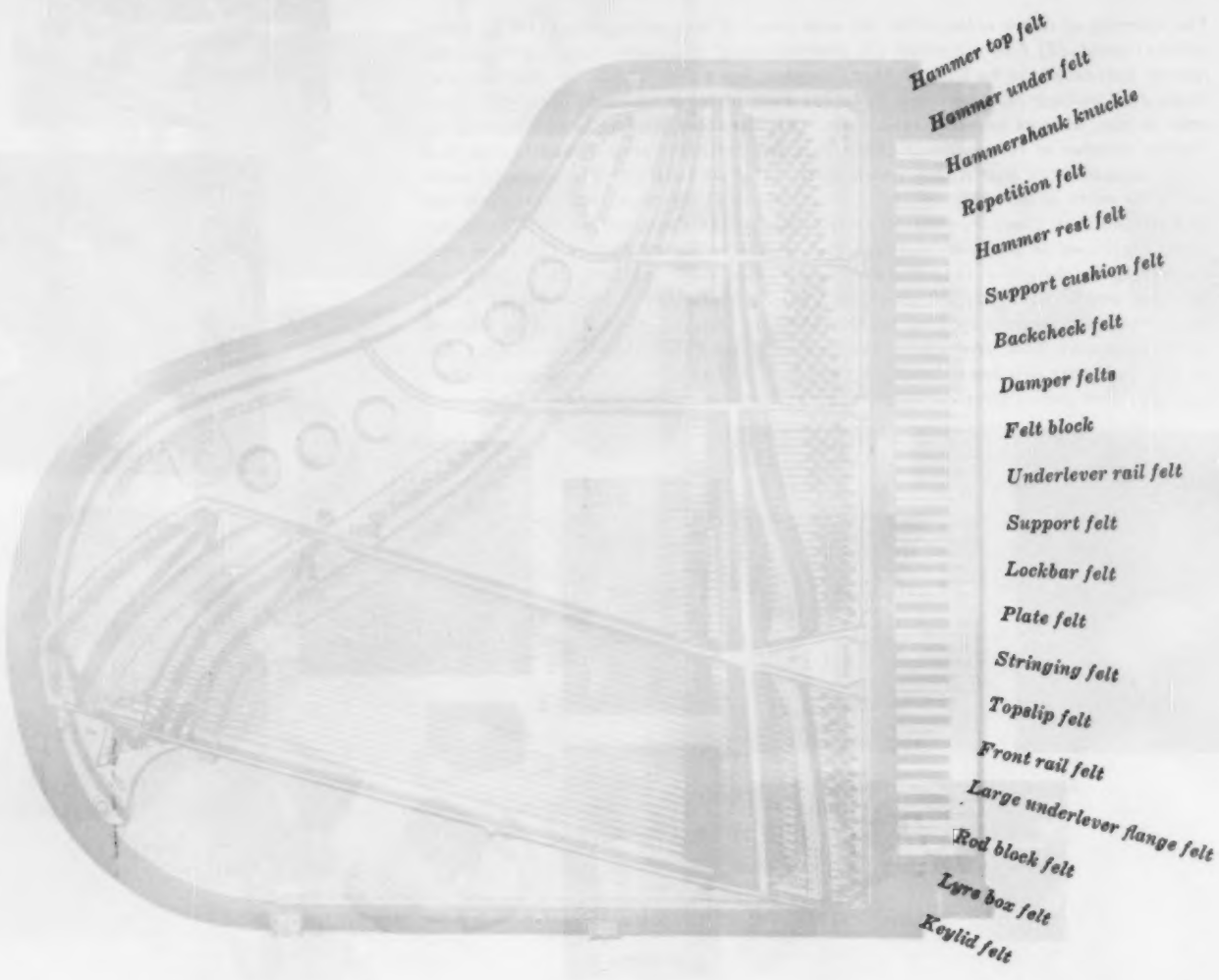
How felt is manufactured

The manufacture of wool felt takes from five to 10 days depending on the hardness required (tensile strengths of 500 psi and higher are standard in certain grades). By the end of the process, roll felt is reduced in thickness from a maximum of six inches to one inch, and sheet felt (a harder grade which is usually supplied in square yard sheets) from three feet to four inches.

In preparation for felting, the wool is first degreased and foreign matter removed. Then, it is blended and carded into a fine web of parallel fibers. Alternate webs are crossed to impart a transverse strength to the pile which is known as a "batt."

A process known as "hardening" consolidates the batt into a fabric having interfacial strength; it is this operation that distinguishes felt manufacture from other wool textile processing. Hardening consists of agitating the entire batt between a vibrating plate and a stationary bedplate under controlled conditions of moisture, heat, and pressure. This induces movement *within* the individual fiber, which seeks to regain the natural crimp it has lost during carding, and among the fibers themselves (which travel in the direction of their root ends). In this way, they penetrate from one web to the next, bonding them together.

The next major operation—"fulling"—controls the shrinkage of the fibers, and thus the thickness, texture, and size of the felt. It does this by replacing the vibration of the hardening process with kneading and turning under the impact of heavy wooden hammers. This causes the laminar structure of the webs to



diminish and gradually disappear, to be replaced by a solid fibrous mass. The hardness (density) of the felt is determined by the length of time of the fulling process.

Washing and neutralizing the felt to remove traces of chemicals and acids, dying, drying, and finishing are the final manufacturing processes.

Turning felt into products

Like many other aspects of this versatile textile material, its fabrication techniques are unexpected and unusual. The hard grades resemble wood more than they do wool, and felt of these grades is formed by processes similar to those used for wood or metal — felt parts are commonly sheared, punched, die cut, skived, ground, chiseled, turned in a special lathe, and surfaced with sandpaper. Certain other grades are extruded to form continuous lubrication wicks from 1/16 inch diameter for electric razors, up to one-inch diameter for farm tractors. The bondage between the fibers and surfaces of a piece of felt is so uniform, despite the laminar formation of the material from which it was manufactured, that cut sections will not separate into layers —it can be used for such intricate machine parts as gaskets with cross sections 1/8-inch square, cut and pierced with holes for screws or locating dowels 1/32 inch from an edge. Different shaped pieces of felt are often united by stitching, or by the application of adhesives.

When felt is subjected to wear, it wears through without any change of frictional resistance or any other specific property because it is not surrounded by any foreign material or reinforced with warp or filler strands.

Applications

Wool felt is used in practically every industry and often in ways that make it look unlike the textile that it is. Below is a summary of the industrial functions of the material.

Friction: Felt is used as a friction material because it is abrasive (in certain grades), tough, uniform, has an absorptive surface for wiping, polishing, and correcting flaws, and can be given a surface texture that provides traction (hair felts). Applications: polishing wheels for optical glass, airplane propellers, strip steel, silver and silver plate, tile, plastics, marble, and pottery; clutch facings; in rolling mills, to pull strip brass through a cleaning bath; grease-impregnated washer to provide tension for the adjustment of an automobile spotlight control; bottom covers on various objects to prevent slipping and scratching.

Insulation: Felt is used as a surface material for both acoustical and thermal insulation because of the millions of tiny air pockets that are locked into its fibers. Acoustically, it can reduce resonance, adjust reverberation, and quiet sound. Thermally, it can reduce heat loss or transmission. Applications: wall surfacing for television studios and restaurants; pi-

The diversity of felt is indicated by the wide range of its applications. (1) Felt wheel polishes metal. (2) Felt ink roller. (3) Fabrication of felt wicks. (4, 4a) Freight car journal box, developed by U. S. Rubber Company, has a felt "saddle," shown back and front, with wicking ends for lubrication. (5) Felt, installed under tie plates that hold rails to ties, absorbs vibration and noise. (6) Earphone headset, manufactured by Playtex division of International Latex, uses felt for cushioning, strengthening, and sound damping. (7) Felt wheels polish glass. (8) Felt bobs. (9) Felt seals on inner and outer races of ball bearings. (10) Sheet felt. (11) Synthetic felt filter cartridge by American Felt Company. (12) Hair felt wheel. (13) Extruded felt with precision-cut channel used in piano action. (14) Felt wall covering by Felters Company with a design by Ignez Franco. (15) Felt used as a friction clutch in lever puller. (16) Close tolerance die cut felt. (17) Oil filter felt. (18) Synthetic felt filter for engine intake air cleaner; felt supplied by Troy Blanket Mills, air cleaner manufactured by Donaldson Company, St. Paul, Minn. (19) Felt gaskets. (20) Felt polishing wheel. (21) Reverse jet air filter unit has a felt filter. (22) Felt used as a cushion for heavy machinery. (23) Felt for oil filter cartridge. (24) Felt nibs in marking pens.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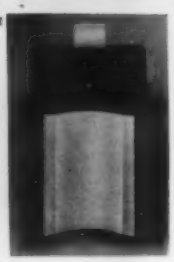
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anos; hi-fi receivers; in airplanes, to isolate vibrating parts, and in airplane cabins to dampen resonance and prevent escape of heat at high altitudes; gaskets for ducts and linings in air conditioning and refrigeration systems; weather stripping; clothing.

Spacing: In the form of gaskets, washers, and spacers, felt is used as a spacing material in every kind of appliance, machine, and machine tool.

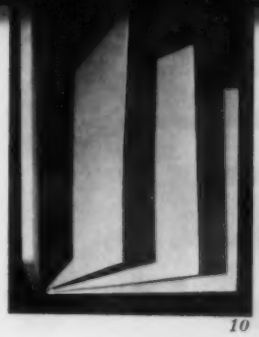
Sealing: Felt, alone and in combination with other materials, is employed as a seal to prevent lubrication loss from within, and entrance of dirt, dust, and grit from without. Its resilience provides constant sealing pressure regardless of wear, end-play, or misalignments. Its low surface friction minimizes wear and heat build-up. It cannot chip or break its edges, is easily formed, is inexpensive, and has good moisture and oil absorption characteristics. Applications: ball bearings; grease gun pistons; weather stripping for car windows; driveshaft housings; photographic equipment.

Cushioning; felt has applications as a cushioning material because wool fibers are natural springs and provide natural cushioning against shocks and vibration. When heavy machinery is mounted on felt, the amount of transmitted vibration is said to be reduced by as much as 85 per cent. Applications: percussion hammers, dampers, and pads in pianos; medical (corn plasters) and orthopedic pads and casts where it has cushioning, supporting, and anti-chafing functions; mounts to isolate precision instruments and tools from floor vibration; laundry press pads; padding for lining of storage and shipping containers; bumpers on message cylinders in tube conveyor systems.

Filtration: Because felt has a uniformly controlled texture, it is extremely efficient in filtering impurities or recovering solids from fluids and gases. In addition, it is non-reactive to acids in low concentrations, has low clogging rates, high particle retention efficiency, and can be sterilized for medical purposes. Applications: removal of radioactive dust; gravity and pressure filters for electroplating solutions, solvents, paints, drugs, oils, etc.; gas masks and respirators; air conditioners; swimming pools; medically, it is used in intravenous feeding to dispense saline solution at a measured rate.

Wicking: Felt is used as a wicking medium because of its wide range of capillarity, long life, non-fray construction, high-absorption capacity, and resiliency. It can store, filter, circulate, and deliver a specified amount of liquid such as oil, water, or ink. Applications: lubrication of motor armature shafts and journal bearings; automatic printing equipment, numbering machines and postage meters; distributing liquid pigment in the manufacture of carbon paper; blotters to remove excess pigment in silk screen printing; wicks in marking pens, applicators, etc.

Wall Covering: One of the latest uses of felt is as a wall covering ma-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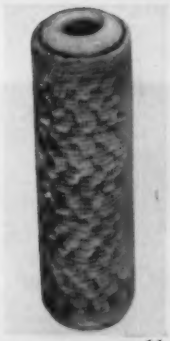
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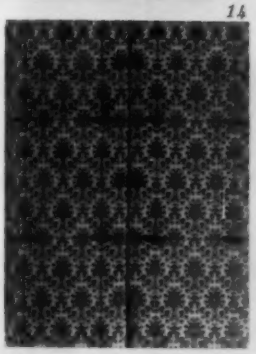
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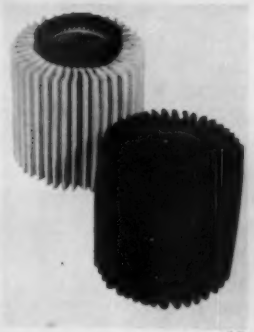
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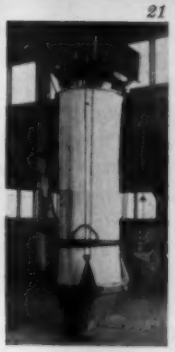
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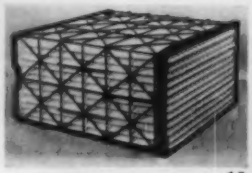
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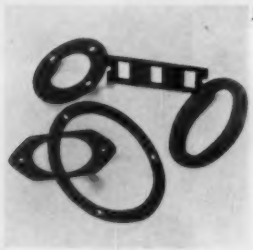
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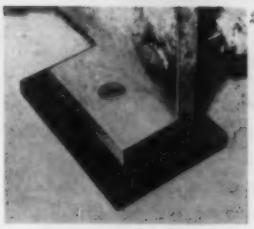
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terial. It can be dyed and printed in a rich range of colors; it will not shrink or stretch. It repels water and oil borne stains, and can be made moth and flame resistant. In addition, wool felt wall coverings have good sound absorptive qualities. They are supplied with a reinforced backing which permits them to be applied with a regular wall adhesive. Recent installations include the Playbill Restaurant in the Manhattan Hotel designed by Melanie Kahane; Stouffer's Restaurant designed by Raymond Loewy Associates; the dining hall in the American University designed by Ken White Associates; and the dining room in the Denver-Hilton Hotel designed by I. M. Pei Associates.

The same felt product application often combines several functions: in ball bearings, the same piece of felt is used for sealing and lubrication; in vacuum cleaners, for filtration and sound absorption; and in ink rollers, for filtration and wicking.

The material's versatility is further demonstrated by the fact that different grades can be used in opposite ways: felt used for polishing metallic mirrors for instruments is soft and silky, while felt for polishing gems is hard and coarse; felt used in bearings to retain lubricants and exclude grit is impermeable, but felt used to filter out bacteria during the manufacture of flavoring syrups has a very fine and uniform degree of porosity.

Recent developments

The functions of felt are such that, as new machines and new products are developed, it will most likely still be specified for the unchanging requirements of lubrication, sealing, cushioning, etc. In addition, however, new felt products are continually being developed. The American Felt Company, which maintains a complete research and engineering laboratory, recently introduced several new all-synthetic felt products. These included a nylon press pad for power laundries, and a washable drapery fabric—Feutron 63—that is said to be color fast, stretch-, sag-, and shrinkproof.

A recent independently made report (published in Audio Magazine in August, 1959) has demonstrated that wool felt used in hi-fi speaker cabinets is a superior sound damping medium to cellulose and fibrous glass, furnishing a good balance between the high and low sounds. It functions especially well in the low frequency range where unwelcome cabinet resonances occur and where most of the power is transmitted.

Important felt products now in the research stage include a rubber-impregnated expansion joint for concrete highways, and a weather stripping for all glass and metal buildings.

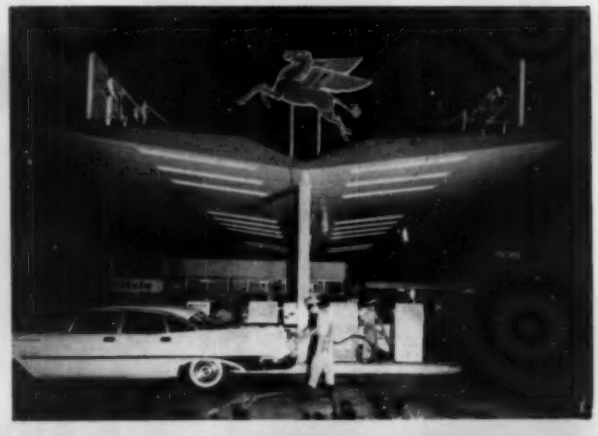
Acknowledgements: The American Felt Company, The Bacon Felt Company, The Central Felt and Fabrics Corporation, The Continental Felt Company, The Felt Association, and The Felters Company.

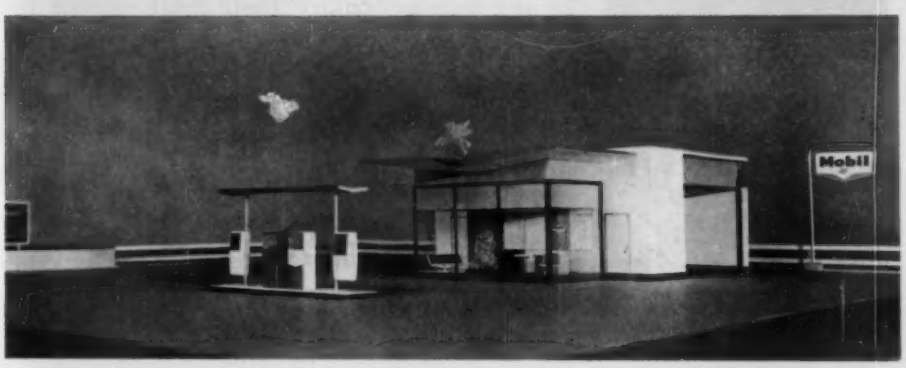
Global gas stations

A master plan for Mobil's overseas service stations makes them adaptable to Bombay, Marseilles, Ghana or Caracas

A little over a year ago the Socony Mobil Oil Company asked designer Peter Schladermundt to solve a small but delicate problem in commercial diplomacy. The firm wanted to expand its market in Venezuela, and proposed to do so by building service stations like those it had in the States. But Mobil's Venezuelan dealers would have none of them. Esthetically the stations didn't come up to the country's architectural standards (which are high) and practically they didn't make sense (Mobil's stateside pumps are out in the open, and Venezuela's climate makes some sort of shelter mandatory). Schladermundt complied by designing a series of stations which hid lubricating bays behind pierced concrete screens, ventilated salesrooms with a frieze of openwork spandrels, and sheltered pumps under a winged canopy that was a three-dimensional projection of the winged form at the base of the Mobil symbol (designed by Schladermundt in 1956). The new stations were received so well and worked so well (for one thing, attendants took their siestas under the canopy where customers could find them) that Mobil decided to use the designs further afield—for its expanding operations in West Africa. Certain modifications had to be made—wood had to be substituted for steel in the canopy frame in some locales because of humidity, and the canopy had to be made higher to accommodate a common conveyance called a "mammy wagon", a high-sided stake truck whose passengers stood upright in the back. But the reception to the stations was the same as in Venezuela. On the strength of this the oil company determined to convert its small venture in Latin American diplomacy into a full-scale foreign policy. And to implement this it sent Schladermundt on a round-the-world mission, gathering data on building materials and methods, and cultural matters, in all the areas where Mobil operated, or planned to operate.

The result is a master plan for a series of design-related service stations in variable sizes ranging from two-pump islands for rural roads to elaborate emporia for major arteries. Each station's dominant architectural device is the winged canopy or roof, and although their dimensions are not modular (in the purest sense), their proportions are—i.e., a small operator with two pumps and a salesroom who wanted to add a lubricating bay, and later, perhaps, a second bay, would have to make some structural alterations, but the resulting building would be homogeneous architecture. But almost more important than their design integrity is their allowance for design individuality. In order to make them feasible anywhere, Schladermundt has designed them to be adaptable to tropical or temperate climates, to materials of various kinds (wood, concrete, enameled steel), and to building techniques and skills from primitive to sophisticated. The heart of this master-planning is a 70-page manual of specifications, control drawings for dimensions of display elements, plans and blueprints for various kinds of construction, color guides, and renderings of arrangements for salesrooms.—*B. D.*





Mobil symbol *(top left) is converted into architecture in (top to bottom at left) Venezuela, Mexico, Accra. Master plan for all the company's overseas service stations developed from these localized projects. Variable in size, and adaptable to the building methods and materials — and climate — of many geographical areas, they maintain family resemblance through use of wingform canopy and repetitive structural elements. Top to bottom, right: two-pump island; island with salesroom; island with salesroom and one lubricating bay; island, salesroom, and two lubricating bays under raised canopy; and the same facilities with canopy-roof and side-entrance bays shielded by screen.*

The Design Shift 1950-1960

BY EDGAR KAUFMANN, JR.

Ten years ago, at the request of the Museum of Modern Art, I wrote a text published under the title *What is Modern Design?* Because this was one of an introductory series issued for people inexperienced in the modern arts, it was reviewed before publication by some New York teachers. To my dismay, one of their most urgent recommendations was that I include a series of definite rules — a recipe for modern design!

After some unsuccessful balking, I added to the text a section headed *Twelve Precepts of Modern Design.* Since I firmly held a belief that no rules are valid forever, and that it is poor practice to pretend they are, I took refuge under the mantle of history. The precepts were stated to be those that, according to a consensus, had remained acceptable to the best minds that wrote or spoke on behalf of design, from William Morris to 1950. Of course, these tenets had not always been followed in actuality, but they did represent an acknowledged ideal. Hundreds, if not thousands, of working designers, design teachers, and critics had used ideas close to the twelve precepts listed, however much words might vary over the course of 80 or 90 years.

Recently, speaking at Pratt Institute as a guest of the New York Chapter of ASID, I looked back at the twelve precepts set down in 1950, to see how valid they appeared in 1960. Some significant shifts had taken place it seemed to me, and here is what I observed of those shifts. I have grouped the 1950 precepts here more conveniently than in their original dodecalogical form.

Design should express the needs and spirit of the times.

We still believe in this to a large degree, surely. But in fact the unacknowledged bias has always been toward the more constructive aspects of our needs, of our spirit. Furthermore, the uniqueness of our times seems less important to us than ten years ago, and resemblances to the past or portions of it seem more important. We are willing to dwell on the parallelisms between our needs and feelings and those of other times and places. Our need to be different has become weaker than our need to be ourselves, I'd say.

Design should reflect the leading intellectual concepts and artistic insights of its day.

This is a gloss on the above, arising from the speed and spread of communications. But the message to be communicated is changing in character, as noted in part above, and further below.

Structure and materials should express as directly as possible the human requirements that give rise to a design; novel materials and structures should be favored.

Technological novelties continue apace but, with reduced pressure "to be different," the value of their novelty per se is diminished. Inversely there is a wider, more profound effort to understand human requirements and to express them more adequately and more aptly.

A modern design should not dissimulate its functions, structures or materials.

"Honesty of expression" is one of the oldest precepts of modern design, one of the most frequently uttered, and yet less often observed in fact. When Louis Kahn exposes the utilities in his splendid new medical research laboratory building for the University of Pennsylvania, this is no indication that he (or anyone) would do the same in a residence or a concert hall. Who today would shield the motors of a car or a refrigerator with plexiglass? Once, similar ideas were tried. Who would prefer to expose the metal surface of a cast-iron tub? By now it has become clear, though I don't know where it's been said in print, that we expect certain rather effective token elements of practicality to be expressed, serving as a firm basis for more psychological expressions that modulate the design to fit our sense of the appropriate. If this is correctly stated, it means that the road to ornament is once again wide open; and, in fact, ornament is increasingly accepted in modern design today.

A modern design should be integrated as a visually direct and unembellished whole.

Part of this is rather like Palladio's *uno intero e ben finito corpo;* the unity of a design is in all ages its passport to existence. A lone kitchen cabinet would reveal to the future something of our sense of style, but rather little of our abilities to organize forms. Yet style, if clearly developed, can imply a whole, as classical remains, for example, testify. So far as "unembellished" is concerned, it is a dwindling ideal. Much modern ornament is bad, but, after all, subject to improvement. If history is a guide, a tidal ebb and flow is not uncommon between the admiration of simplicity and that of complexity; today the tempo of alternation is a good deal faster than ever before, and that is in fact the mark of our modernity.

Human values should be emphasized in design over technological ones; democratic values, over the desire for elegance or exclusivity.

On the whole it seems that these ideas are more powerful than ten years ago. We expect more service and less durability. The special, the rare, retain their status ever more briefly. But it would be an error to suppose this trend irreversible. Technology is evolving made-to-order procedures that, if they catch on and take hold there, will probably affect design in general over the next few decades, as Reyner Banham's "1960" section in the March *Architectural Review* indicates.

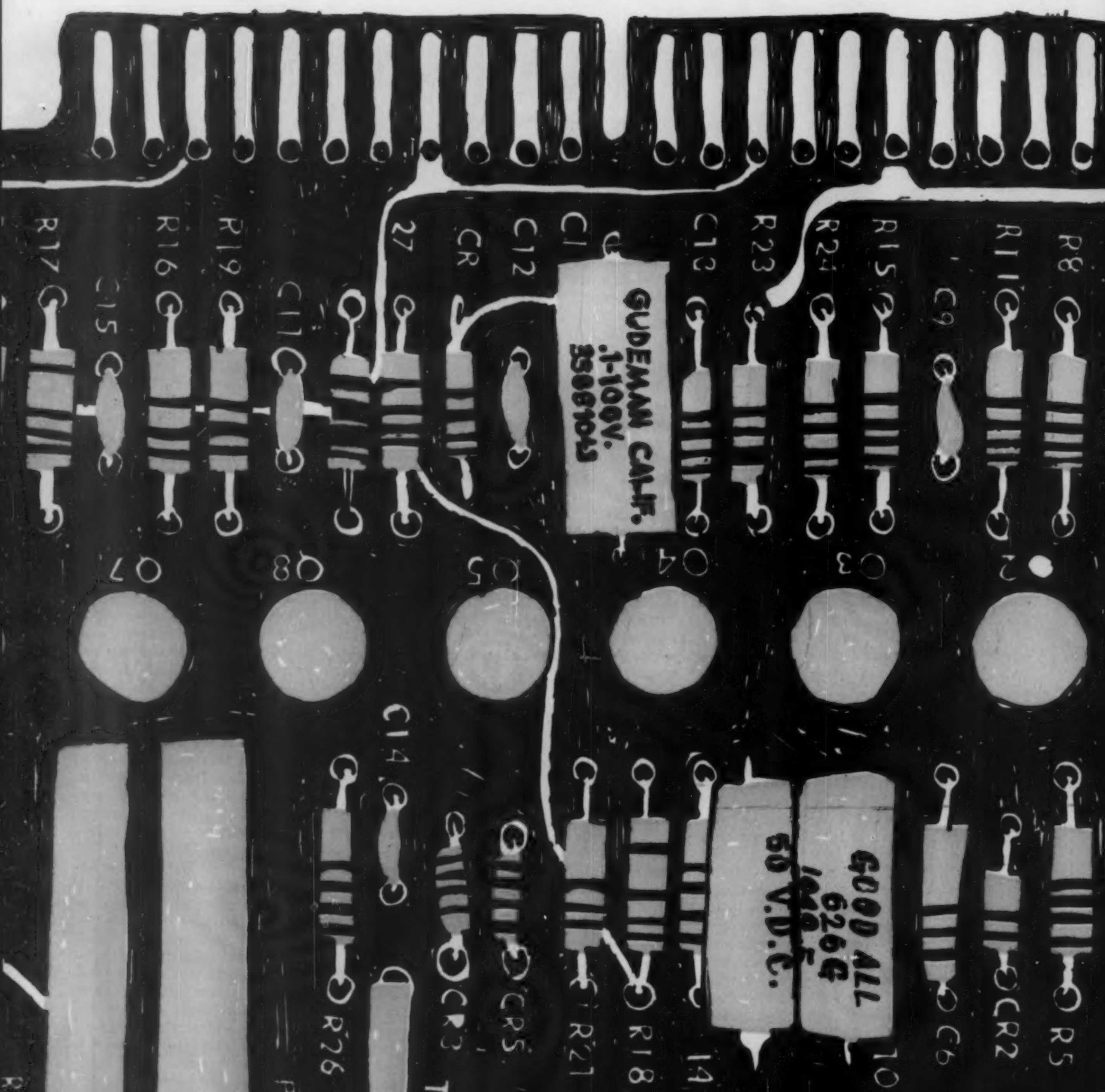
One design characteristic not even mentioned in 1950 seems to have resumed a role in 1960 —formality. This is expressed in symmetry, poise, and height that now challenge long established preferences for occult balance, dynamism, and horizontal thrust. As with simplicity, this seems to be an instance of the tides of taste. Simplicity, to be sure, has another and more profound meaning (Frank Lloyd Wright was eloquent on this insight) but one that closely parallels the concepts of unity and integrity, already mentioned. Formality seems to me incapable of such development in depth —it is a surface effect referring to a passing mood, as society is now constituted.

It is possible to draw some tentative conclusions from these shifts concerning the future of design and, in particular, of design education. The conclusions will be no better than the accuracy with which the shifts have been noted, and those who disagree with what has been said so far will be, therefore, even less happy with the rest. First, I believe it's fair to say that design is actively engaged in transforming itself and its relationship to the community. Secondly, these changes, combined with others purely social and technological, make the two leading ideas in design education seem almost equally inadequate. In capsule form, these two ideas are:

(a) a designer should be taught to be competent in his trade, skilled in the technologies (at least the principal ones) of production, presentation and persuasion, and familiar with the design successes and the design ideals of his day.

(b) a designer should be taught to be a scholar and a gentleman, functioning as a professional form-giver who thinks of the community, and its path out of the past into the future, as well as of his own well-groomed satisfactions.

I submit that both these formulations (as well as the post-educational one that says a designer is first and foremost a business man) are rooted in a past that is daily slipping away from us. The shift in design ideals—and the shifts of meaning that are evident even in those precepts that need not be either re-phrased or abandoned —is one piece of evidence to support the claim. The acceptable ideals of design today, and for the closer future, need stating; flexibility and adaptability will be essential, and that means the ideals need to be considered in depth, below the tides of taste and removed from the discolorations of tact. Otherwise there is the prospect that doing will become increasingly thoughtless, and thought increasingly futile, in the field of design.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The roots of the product

By ARTHUR GREGOR

One research director's comment about the status of research in his company might well apply to in-company Research and Development in general. He said: "When a research division was first set up here, research was fashionable, like walnut panelling; today it has become crucial." The place R&D has in the product design and development of two companies selected for their very different, though equally design-oriented, products — Ampex Corporation, manufacturers of magnetic tape products, and Caloric Appliance Corporation, producers of gas ranges and other domestic gas products—is the subject of this third installment in ID's series on Research, Development and Testing.

Data storage, like other functions which are giving modern industry its new character, is a field whose theoretical background is still being defined. Product performance therefore depends—more than in most fields—on how much the producing company knows about it. Consequently research and development hold a vital place at Ampex, a leader in the field of products for data storage on magnetic tape. A look at these activities, and at the company attitude toward them, indicates how important they are to the very life of the company.

For all its emphasis on R & D, however, Ampex accidentally hit upon the product that put it into its present business. This was the tape recorder—once thought of as a handy communications device but today acknowledged as a vital factor in the rapidly multiplying activities of data acquisition, storage and transfer. Started shortly after World War II by a Russian émigré scientist, Alexander M. Poniatoff, Ampex first made electrical motors. It began pursuing its present product course when one of its engineers was present at the first demonstration in this country of the captured German magnetic tape recorder, the Magnetophone. Using this as their example, Ampex engineers came up with a prototype model of their own. Bing Crosby became interested (he had long wanted to stop his daily "live" shows), ordered 20 models at $4000 each, sold them to the American Broadcasting Co., and Ampex was in business with a very promising post-war product. Magnetic tape, of course, proved a medium which could retain data far different from a crooner's voice.

From crooner to the stars

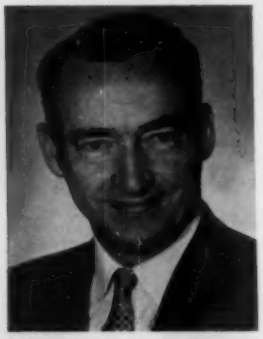
About the time when Ampex first presented its tape recorders to the world, another breed of post-war products—the electronic computer—rumbled portentously in the laboratories. Early computer manufacturers, IBM and Remington Rand, made their own tape recorder equipment for their data-processing systems. But when National Cash Register decided to enter the electronic computer field in 1957, they gave Ampex a contract for the development and manufacture of computer tape mechanisms. (For a detailed study of the action principles behind magnetic tape, see ID May, 1958) Following the N.C.R. contract, Ampex signed similar agreements with Philco for its Transac units and with General Electric for the ERMA system, and Ampex's place as a leading supplier of tape transports to the sophisticated computer-consumers was assured. Ampex research also rose to the needs of missile and space technology for rapid data absorption and today the company supplies instrumentation recorders for guided missile and rocket research programs, satellite tracking and various laboratory applications. Ampex annual sales have risen within the last five years from ten million to over 68 million.

The famed Videotape recorder

If Ampex's first major product came to them from the outside, its second product shocker came solely from advanced development work carried on within its own ranks. The concept of video tape recording as a desirable method for storing *visual* data originated when it became possible to embed *audio* signals in magnetic patterns. But video taping presented engineering problems not encountered with audio signals. (The main problem was storing the abundance of pulses that make up the video image transformed into electric energy). In 1951 Ampex engaged a young mathematician-engineer unusually keen on the subject of video recording, and put him in charge of a small crew of engineers who saw visions of taped pictures in the engineering darkness into which they plunged. The man in charge was 31-year-old Charles Ginsburg, whose brilliance and zeal were amply rewarded. Working with half a dozen assistants, Ginsburg was able to report the needed breakthrough four years after the project commenced, and in 1956 the company's first Videotape (Ampex trademark) recorder was unveiled at a dramatic presentation to the National Association of Television Broadcasters. To date, Ampex has sold over 650 of the video recorders and it expects this figure will rise as more individual tv stations and educational tv setups start putting their programs on tape. A recent application of video taping to record audio and video signals in missile tracking may also extend the video recorder market considerably.

Who deserves the credit?

Ampex is outspoken in crediting the new products to the brilliance of its engineers. Its engineers—partly due



***Ampex** is headed by officers and by division managers. Some of them are from left to right, top: Alexander Poniatoff, founder and Chairman of the Board; George Long, President; below: Robert Sackman, Executive Vice-President; Charles A. Black, Mgr., Financial Relations; John Jipp, Vice-President, Mgr. Ampex Data Products Co., and J. D. Bowles, Mgr. of Computer Products Div.*

to loyalty, but largely because it is so —return the compliment and salute the company for providing a climate of creativity, and for recognizing the achievement of its engineers. Ampex demonstrably appreciates its engineers. (Although he is a relatively new member, Charles Ginsburg recently was made a vice president, primarily as a result of his contribution to the company's product research and development.) The background of Ampex's founder and chairman of the board, Alexander M. Poniatoff, is unquestionably a contributing factor in the company's enlightened attitude toward engineering and engineers. As an engineer who graduated from the University of Kazan in pre-revolutionary Russia, he represents an era when engineering was primarily a pioneering activity, and a pioneering spirit is perhaps the most noticeable force at work within the company's buildings in Redwood City and Sunnyvale, California. If Ampex *has* a formula, it is R. Sackman's (Executive Vice President) equation, "Knowledge plus research plus ingenuity plus hard work equals products."

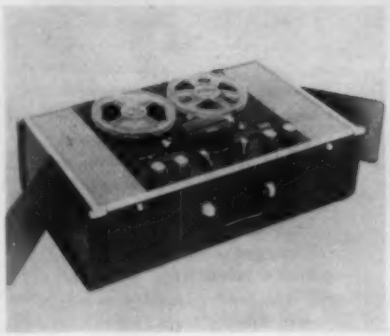
In-company and contract research

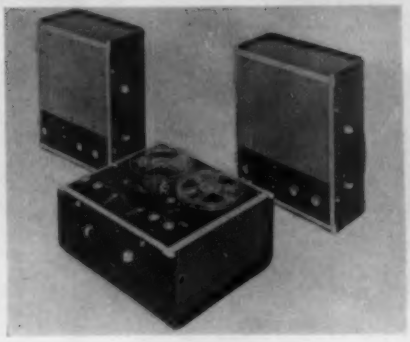
The work carried out by in-company research groups differs considerably from that done by research teams affilated with an independent research service (see ID June, 1960). The basic difference is this: Contract research groups perform on what might be called a "research repertory" basis—they work in many scientific areas, and these are often unrelated. In-company groups, however, work within one broad area. This difference accounts for the overall research attitude among the more-or-less-pure scientists in companies: they are more "blue-sky" than the contract researcher who is called in by a client to solve a specific problem as soon as possible.

Company research groups keep astir the company's "inner flame of knowledge." Although of course they rarely explore scientific areas unrelated to the company's product interests, they do concern themselves with gaining a deeper awareness in those fields of science to which the company product-line belongs. They aid in putting the company on a more secure scientific footing—a process that often results in better products. From them flows much of a company's intellectual vitality and stability; to them all the company's scientific problems may be referred for clarification. Development groups perform a different function. Their objectives are always clearly defined, and the area within which they work on a given project is limited by the problem at hand. They are definitely not "blue-sky," but are the practical interpreters who apply the appropriate research findings and translate product needs into a workable technology.

Research and engineering at Ampex

About 800, or 20 per cent, of Ampex's nearly 4500 employees make up its technical personnel. Thirty of these constitute the staff for the research section, which is divided into two groups: the research laboratory and research's advanced development group. The research laboratory's main task is to explore the principles of magnetic tape recording. Its director, Dr. Skipwith Athey, defines the function of his group of 23 scientists and engineers thus: "It is our job to build the fundamental underpinning, to understand the next layer of abstraction as to just what magnetic recording is, how it works, and what makes it work." This objective may appear to be after the fact, considering the high-caliber products put out by Ampex. But there are many aspects of magnetic tape recording which are not yet understood, at Ampex or anywhere else. "Tape recording," says Dr. Athey, "works well, but there is a lot left to learn to have a complete picture." Very crude magnetic tape can be made by the simplest of methods, but a good deal of advanced technology is required to manufacture sophisticated controllable tape with optimum properties for maximum data-packing density, best signal-to-





Ampex first achieved fame in 1956 when it introduced its Videotape Ampex (trademark) recorder capable of taping video shows. The recorder (top picture) represented an important breakthrough in magnetic tape recording technology; it was developed by Ampex's special R & D group, headed by Charles Ginsburg. In addition to professional video and audio products, Ampex also manufactures various types of deluxe home audio recorders; some are consoles which include recorder, radio and phono, all in stereo; others are portable stereo recorders. The Ampex 970 (at right) contains speakers for stereo playback, can play 4-track, 2-track, and single-track tapes. The Ampex 2560 (far right) is a portable stereo system consisting of the 960 recorder/reproducer and speakers. Ampex audio home equipment is produced by Ampex Audio Co.

noise ratio and maximum uniformity from defect. To arrive at this highly developed know-how, Dr. Athey's group is carrying on investigations in all phases of tape recording: the tape medium, surface finish, recording heads. "You have to be fussy," says Dr. Athey, "when you make magnetic tape which, with 16 channels spread across one inch of width, cannot have one 'dropout' on a 2400-foot roll."

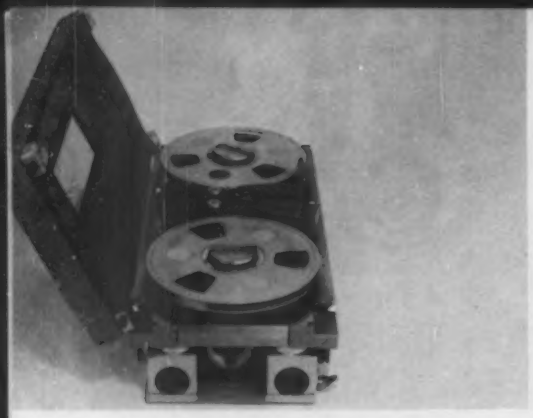
While the efforts of the research laboratory group are not directed toward product innovation as such, that is the goal of the advanced development group. As with most companies, the exact nature of the work carried on in research divisions is not divulged. But it is no secret that techniques like electron beam recording (ID February, 1960) are constantly under development in laboratories concerned with that phase of technology, and the development group of Ampex's research department has not been idle in that pursuit.

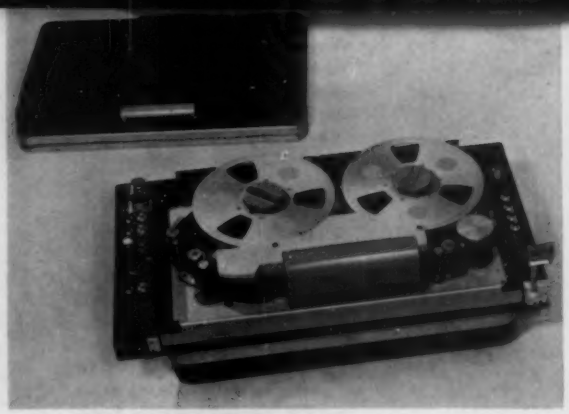
But development or innovation may still be at least "semi-blue-sky" and it is the company's engineering groups which incorporate client needs within existing product lines, and develop the clearly defined product objectives. Development at Ampex means engineering, and all of the company's engineers—except those who concern themselves solely with production problems—are in one way or another involved in product development. The objectives for these developments are generally to meet market needs described by sales people to the product planning groups in charge of the various Ampex product types. At Ampex product planning functions as the instigator, coordinator and overseer of a product development in its full pre-production phase.

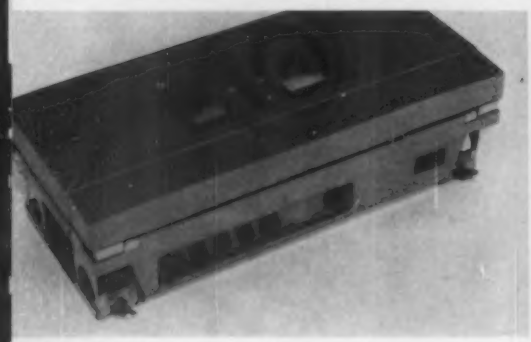
Ampex's organizational structure

Last November Ampex went through a reorganization which resulted in the formation of five product-oriented companies and an international organization to handle foreign sales. All five integrated companies are producers. They are, in order of the highest sales output: Ampex Data Products Company (digital transports for computer systems, products for machine and process control, flight test products and telemetering recorders); Ampex Professional Products Company (Videotape recorders, audio products for radio stations and recording studios); Ampex Audio Company (consumer stereophonic tape recorders, and four-track stereo tapes for consumer use through its United Stereo Tapes division); and Orr Industries Company (producers of instrumentation and computer tapes). In addition there is the Ampex Military Products Company, formed for the purpose of doing R & D work for the government. Each of these is headed by a general manager who reports directly to corporate management. And each producing company has its own product planning group.

Here is an example of how product planning works at Ampex. To keep abreast of the computer market, the company assigns an account manager to a client in his area. He serves as the eyes and ears for Ampex and, if required, will have the company send out a group of engineers to work closely with the customer. A power group made up of the division manager, marketing manager, engineering manager and product planning manager influences the policies of this important organizational body within the Ampex companies. Once product planning has defined a product, it is scheduled in the engineering program, a project engineer is named and a project team is built up. The project is fully defined in an E.P. (engineering project) report which lists the market, performance specifications, physical requirements, the environment in which the product is going to work, and defines the new product as completely as can be done in the planning stage. During the first phase of the team's work—the system planning phase—various methods of solving the problems are analyzed (for example the tape speed for a tape transport and how to achieve the speed would be







Ampex's ***original product has found wide industrial and military application. To cut down on weight and permit rapid data acquisition during missile and other flight tests, Ampex has put on the market miniaturized instrumentation recorders which use only solid-state electronic components for high reliability, power and space reduction. The AR-200 (at left) was designed primarily for airborne data acquisition but can also be used in undersea research, for surface vehicle analysis, and for other applications calling for exposure to severe shock and enviromental requirements. A similar unit, the AR-300 (right, uses a rotating head assembly, permitting recording frequencies up to four megacycles. To test its ruggedness, each unit is given a vibrational test (far right); head assembly is adjusted during tests (right).***

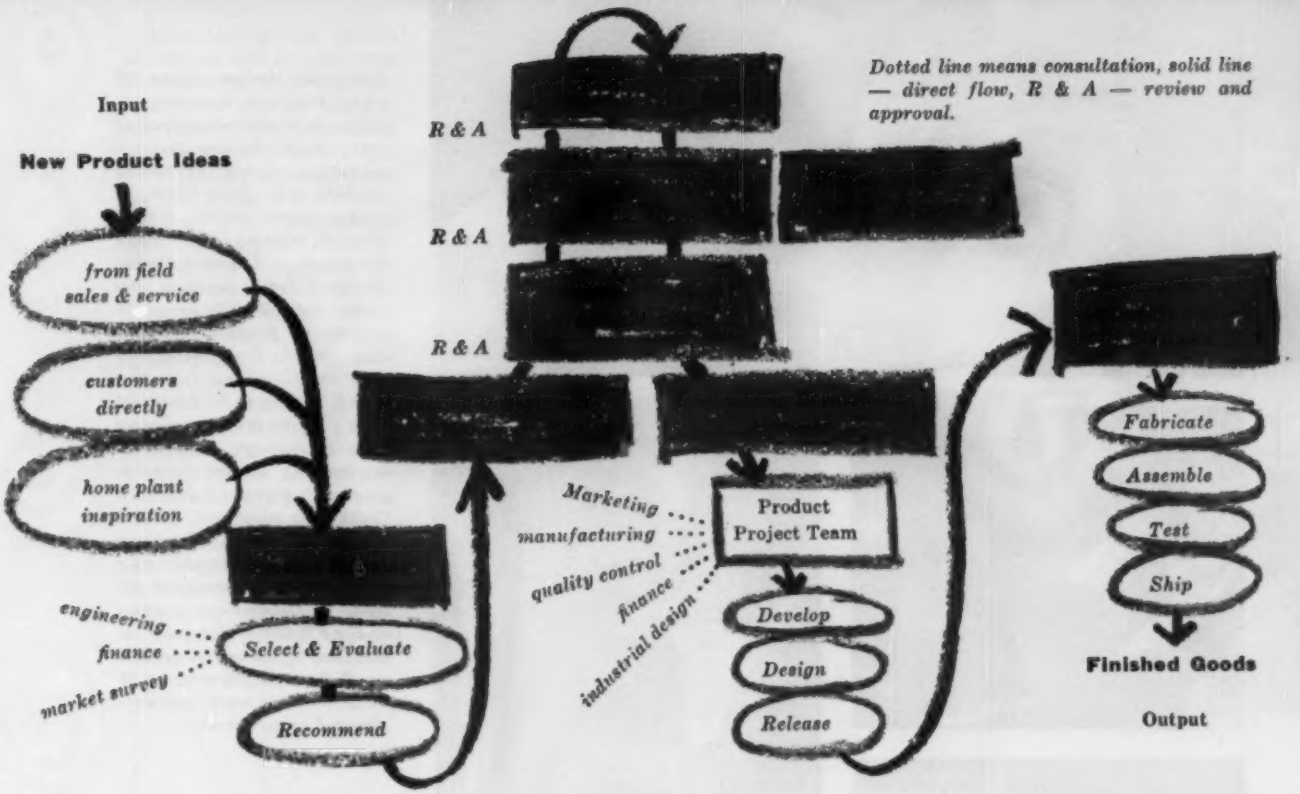
determined in this phase of the project). The next important step is making up the design plan which details such actual production estimates as the extent of manpower and type of machinery needed.

But these established methods are flexible in a company striving to retain the atmosphere of experimentation that characterizes its young and expanding market. In an attempt to arrive at a new product idea, the product planning group in the Data Products Company recently concluded a three-week behind-closed-doors session whose main purpose was creative thinking. What the team wanted was only dimly defined in their minds at the beginning of the session. All they knew was that they wanted a replacement for a certain type of product which the company is making now. A product concept had to be arrived at before formulating the data which is usually available to product planning at the start of a new project. The results of the three-week-long group idea exchange proved satisfactory beyond anticipation, and it is likely that this "brainstorming" method will be used again. One member of the secret-session team was Frank Walsh, manager of industrial design for the Data Products Company (the other attending members were from research, product development and engineering, and product planning). Walsh not only contributed to the early phases of the session, when new methods and products were discussed rather abstractly, but he helped in shaping the evolving product concept into an image and was able to supply the team with renderings and, as the idea became more concrete and the project had progressed sufficiently, scale models.

Industrial design at Ampex

Almost all Ampex products require some human operation, and the young company was quick to establish an industrial design activity that plays a critical part in all its product developments. For the past four years the Data Products Company has had its own industrial design department headed by Walsh and including three designers (Arden Farey, Glenn Smith, Marvin Southcott). Engineers and executives at Ampex acknowledge with enthusiasm and pride the work of their industrial designers. They regard industrial design as essential to the success of their products, and have done so from the start. In the early days—and that was only a few years ago—industrial design was part of engineering. And this close relationship still exists, although design is now set up as a separate department. The human engineering aspects of the tape transports and other computer accessories are vital dimensions of these products, which are among the few in a computer setup that need a good deal of human attention. And the newness of the products has challenged the designers to give them an exterior that suggests the clarity of their logical operation as well as the newness of their purpose. These considerations are expressed in all the products of that division, and the Data Products Company's outputs do show a family resemblance.

Industrial design has a place on every project team. Depending on the problems surrounding a new project, industrial design may be brought into product development at a very early phase. In some cases industrial design is part of the engineering team that goes out into the field to survey the needs for a new product. At other times designers are brought in when the product requirements are clearly defined and need to be executed. In all cases, there is a lot of continued idea exchange among design, engineering, and product planning. Industrial design supplies these, as well as the managing groups, with sketches of new products in the development's initial stages and, later on, sets up mock-ups and finally full-scale models. The industrial design group at the Data Products Company has its own well equipped model shop and designers see the model developments of their projects through to the end as far as this is possible; the more dif-



ficult parts of the modelwork are carried out by model-makers.

Industrial design in the other Ampex divisions is given equal consideration, but as a department in itself it is not as clearly defined. Before Walsh was brought in to set up the in-company department, design for data products was done by the independent design firm of Melvin Best Associates, and the Audio Products division still depends on outside contracts for the cabinet designs of its deluxe home audio products (much of it is done by designer Hugh Craft on a contract basis). Industrial design for the Professional Products Company (Videotape recorders, professional audio products) was until recently handled by one of Ampex's old-time members, Harold Lindsay, who did all of Ampex's design work in its very young days. Lindsay has recently been made Assistant to the Founder and Chairman of the Board, and the industrial design situation in that division is somewhat up in the air at the moment; professional audio products are handled by industrial designers Jim Hackney and Ron Loosen. Chances are, an integrated department will be set up similar to the Data Products Company, which has proven itself as a resourceful adjunct on the home premises. Ampex is still in a state of formation, and the establishment of a design activity which would coordinate design in the various divisions to control and further intensify the family product resemblance is under consideration.

The history of a product

An account of one of Ampex's newest products, the FR-600 high performance tape recorder, may help to show the department relationships set up to coordinate and carry through the development of a new product. About two years ago, Ampex had to face the fact that its basic instrumentation recorder used in testing missiles and other space vehicles was being threatened by competition, and that a new Ampex recorder had to appear on the market in order to maintain the product leadership the company had had before. Two considerations were critical: a new product idea, and time. Normal product development procedure for the product type under consideration would take about three years. This was far too long, and it was clear from the start that normal procedure would have to be by-passed. To cut corners, the Ampex project group worked in parallel rather than sequence, which meant that production plans were made while the design was still being completed. Not to be hampered by normal company activity, the project group—consisting of men from engineering, industrial design, tooling, marketing, manufacturing, quality control and purchasing, and headed by a single project manager—met originally at Carmel, and during the rest of the development were housed in a separate, special building. At Carmel, the design objectives were established, and three activities—engineering development, personnel recruiting, market research—were immediately set under way. At the very start industrial design worked with market research and engineering and supplied the general design concepts, and space and package specifications to engineers. As a result of the field studies, it seemed important that graphic information relating to panel operation should be clear and highly communicable. Consequently, the designers used strong symbols, bright colors and strong color contrasts. Another important aspect of the new recorders was improved accessibility for ease of maintenance. Industrial designers worked closely with the service engineering groups to arrive at the best possible modular arrangements for localizing circuit sections. While the designs were being worked out, the production engineers worked closely with the industrial design and development (engineering) groups to set up for a tooling with practicable tolerances and assembly without selection of parts. In fact all divisions vital in manufacturing collaborated with the

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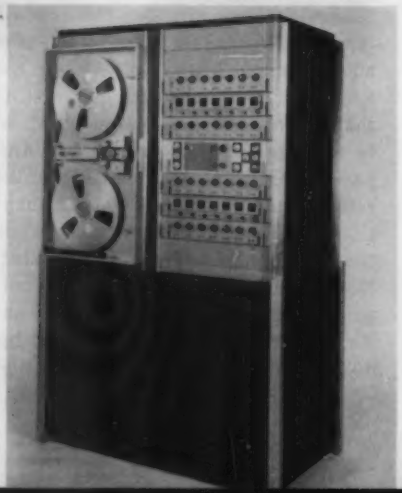
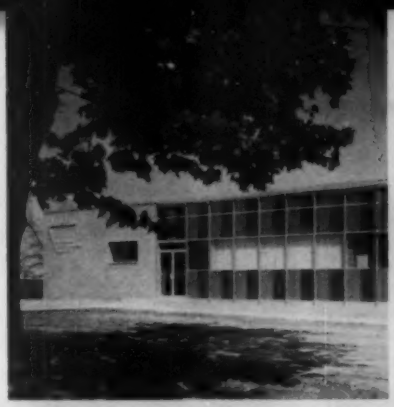


Industrial design group *of Data Products Company is active in product development from image-shaping through prototype models.* 1) *Group consists of, from left to right: Glenn Smith; Frank Walsh, manager; Marvin Southcott and Arden Farey.* 2) *Glenn Smith contours clay model for AR-300's cover.* 3) *Smith and Southcott remove clay model from mold.* 4) *Smith applies resin in lay-up of AR-300 cover.* 5) *Southcott uses a Delta lathe in group's own modelshop.* 6) *Human engineering studies were important part of FR-600 "rush" development. Walsh assists "Elmer Average" in demonstrating strong and weak points of proposed design.* 7) *Oscilloscope portion of the FR-600 design model is installed by industrial designer Richard L. Ketcham.* 8) *This full-scale model was constructed in modelshop.*

project team so that when the design was finally approved, hardly any time was lost in beginning production. Although the FR-600 was an accelerated program (and therefore atypical), the project does indicate the coordinated effort which starts with a product need and ends with an added item on the company's product list.

R&D at Caloric Appliance Corp.

Naturally the character of most in-company research reflects the nature of the company's products—the more complex the theory upon which a product is built, the more science-oriented the research behind it. But with some consumer products — for example, those kitchen appliances whose operation is not based upon a complicated scientific principle—the research that takes place before they are manufactured is often merely an elaborate process of experimentation and testing. At Caloric Appliance Corporation, Topton, Pennsylvania, manufacturers of gas ranges and other domestic gas appliances, R & D means product development. What the company refers to as "research" is in fact developmental activity directed toward specific objectives, arrived at largely by experimentation and testing. Caloric recently opened a new Research and Development Center located away from the manufacturing facilities to give its designers and engineers the



***Caloric** has recently opened this brand new Research and Development Center, which houses its product development staff of 28. Although in the vicinity of manufacturing facilities and general offices, the new center is sufficiently removed from the plant to give designers and engineers the maximum isolation for freedom and creativity. The center (top) houses all facilities needed by the development group. A very well equipped modelshop (bottom), in which mock-ups, appearance and prototype models are made, is on the permises. Testing of gas controls, surface heat, oven performance, etc. is important part of project team's work, and elaborate test equipment is also part of the center's testing laboratory (top, far right). Baking is part of try-outs when new oven is developed, and is a regular laboratory procedure.*

maximum opportunity for freedom and creativity. The facility houses a development staff of 28 who make up the four basic development groups: engineering, styling, drafting, and modelmaking.

The emergence of design awareness

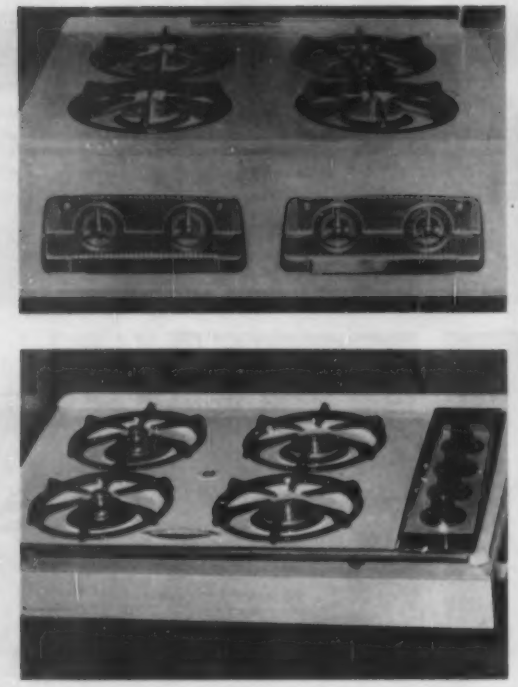
The kind of departmental status which product development now enjoys—a well-defined integrated activity recognized for its critical contribution—is relatively recent. To some extent Caloric was aware of the importance of design soon after the war, but did not act in accordance with this awareness until 1955 when the firm engaged Peter Muller-Munk Associates to establish a new design concept for its basic product—the domestic gas range and oven. In fulfilling their one-year contract, the design team gave Caloric a new free-standing range (the completely boxed-in floor type) whose skeleton structure, backguard, and doors, are still the basis for the company's product line. By the time the Muller-Munk contract expired, Caloric had set up a small design staff which was able to convert the total product line to conform with the changes set down by the consultant designers.

Caloric is a family-owned and managed firm which began manufacturing cast-iron stoves around the turn of the century. Along with the general trend in the market, the company began producing porcelain-enamel stoves in the 1930's and by the end of that decade had a boxed-in free-standing floor model on the market. In 1952, Caloric developed the concept for a gas clothes dryer and turned the design of it over to the Philadelphia Museum School of Art as a student project. As a result of this, Caloric hired one of the participants who was then graduating in industrial design, George W. Myler, and he, along with another designer, one engineer, and one draftsmen, made up the company's product development group. Since then the picture has changed radically. The group used to work in a small room within the company's manufacturing facility. Today they have their own product development center, a bright, modern building well equipped with testing facilities, model shop (above) and a design department staffed by two industrial designers (Robert A. Clark, manager of product styling, and Peter L. Helgeson—both graduates of the Philadelphia Museum School of Art). The entire development center's staff is being headed by George W. Myler, who now has the title of director of product planning.

The R & D behind gas products

The aim of the exploratory work carried on by engineers and designers in the product development facility is twofold: to develop new features for the company's product line, and to incorporate these into the products in a way that will meet the rigorous test requirements set up by the American Gas Association. All products operating on gas must receive the approval of this association and a new product feature, however ingenious, is of no value unless it meets the test.

The engineering crew generally works on improving both the operation and the controls of domestic ranges. Some improvements which Caloric (as well as other gas appliance manufacturers) has incorporated in its products within the last few years are: the "burner with a brain" (a thermostatically controlled top burner), improved lifespan for automatic ignition, and a low-temperature keep-warm system that makes it possible to maintain oven temperature at a level almost as low as room temperature. The principles for these systems were formulated by Caloric's supplier of valves and other oven and burner controls, Robertshaw-Fulton Company, and incorporated into the appropriate control arrangements by engineers from both Robertshaw-Fulton and Caloric. Once established, the systems are tested out by Caloric engineers in their own facilities to see whether or not they will meet the A.G.A.'s test requirements. If they



A recent product development *points up the sort of problem encountered by engineers and design group. To simplify installation of drop-in range, Caloric decided to design a new model in which front cut-outs would be eliminated. The drop-in range before it was redesigned is seen at far left, top; new model appears below. To keep to a specified depth of 2½ inches, new top burners had to be developed, and to eliminate the front cut-outs, a new location for knobs had to be found. The group worked with controls suppliers and project team took 18 months of testing and design trials to reach final design solutions. Knobs were placed alongside the range (at left) and a slotted aluminum extrusion was added to permit making the range-structure of a one-piece shallow stamping. The burners and controls of new drop-in are seen at right.*

do not, further engineering research is required. The industrial design group is brought in for consultation at this early development phase. For a system of controls, however efficient and test-proof, would not be of much use if it could not be incorporated within the design concept of an existing or proposed product.

From market needs to product

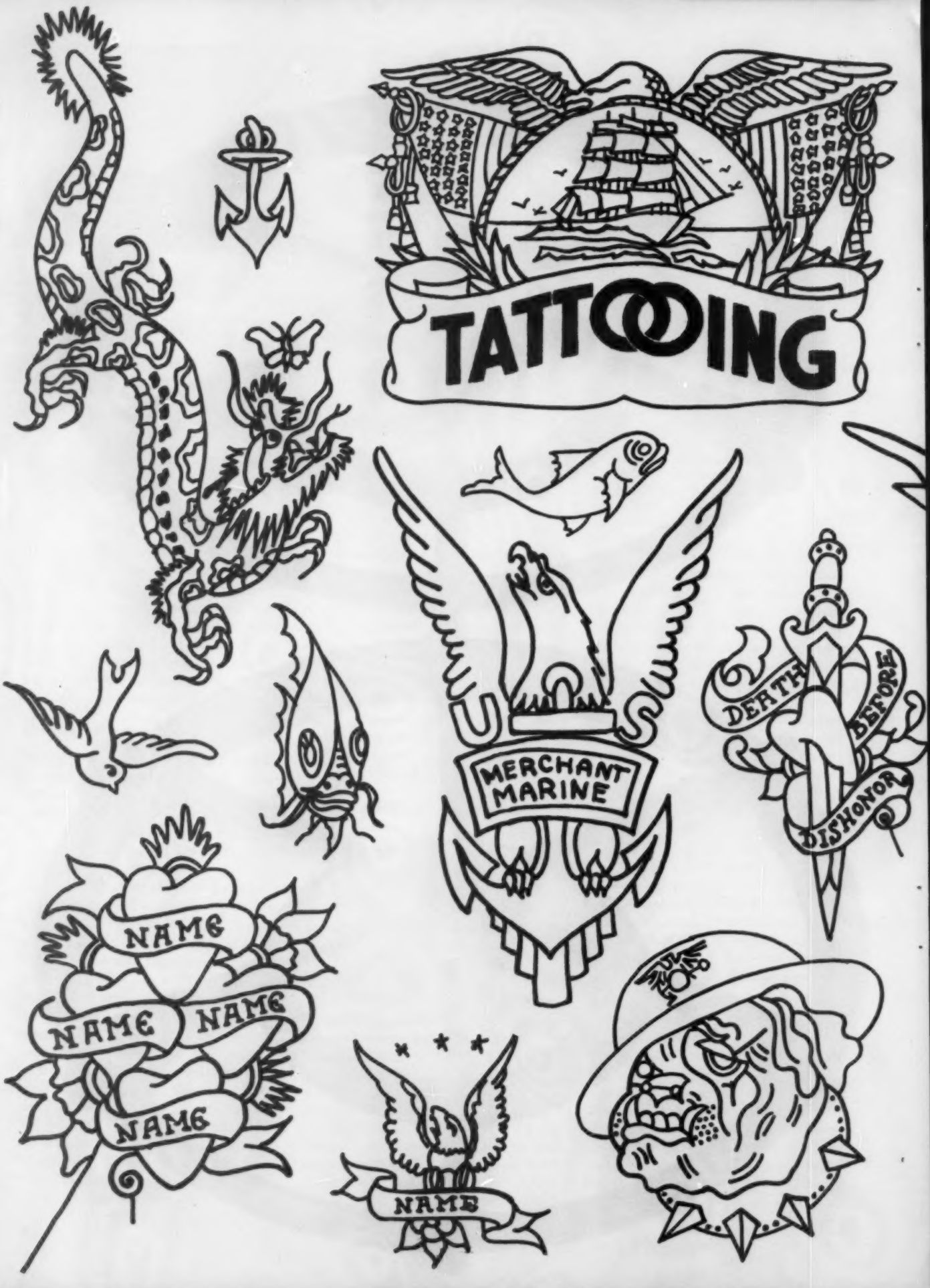
Caloric's controlling group in charge of product review and product-development instigation is its Coordinating Committee, made up of Caloric's president, vice-president in charge of manufacturing, vice-president of sales, plant manager, production manager, and advertising manager. Directives to the product development groups originate within this top policy group, which determines the range size, model types, and also suggests changes to be incorporated in a projected line. A product committee, headed by Myler and made up of designers, engineers, quality control director, and service manager, then reviews the requirements and sets up specific design goals and a plan schedule. Once the basic engineering and design concepts are established, the design group makes sketches of the new product, many of them "wild." Between ten and 20 of these sketches are then shown to the board of directors who will solicit suggestions from a cross-section of internal people—sales, advertising, and others. The selected design is turned into a full-scale appearance mock-up and the presentation to management is repeated. By this time, the design group has worked closely with production and they are dead certain that manufacturing will be able to produce what management sees. Once approved, the design is frozen and a prototype model is made in the facility's own modelshop.

The "drop-in" development

A typical example of product development procedure at Caloric is its recently marketed drop-in range. A good slice of Caloric's sales come from builders to whom they sell ranges as well as color-coordinated "complete" (except for refrigerators and dishwashers) kitchens—range, oven, ventilating hood, and sink. To facilitate the builder's installation of the range unit in the kitchen cabinet, Caloric wanted to develop a product that could simply be dropped into a hole cut in the top of the cabinet—eliminating additional cutouts for controls in the front of the cabinet.

The major problems confronting the project team were in engineering and manufacturing. A drop-in range must obviously be neither heavy nor clumsy for cleaning, and the specified depth of the new design was 2½ inches. This meant that new top burners had to be developed to fit the shallow unit. The drop-in also needed air-openings for combustion and this presented construction problems since an easy-to-install, easy-to-lift-up range must be as solid, as one-piece as possible, and no openings were to be visible. The shallowness of the new design also limited the space for heat expansion, creating a problem in keeping the surface temperature below the allowable maximum. Also since the knobs could not be placed in front, they had to be located in such a way that cooking utensils would not blast heat on them. The trials in which all types of newly developed controls and burners were tested and combustion versus minimum air-openings were checked—and during which it was decided to place the knobs parallel to the burners in the vertical plane — took 18 months.

The manufacturing problem was this: it is impossible to enamel a shallow stamping—the range structure—which has slots in it. To get around this, the design group decided on an aluminum extrusion as part of the range construction; the necessary air-slots were incorporated into the extrusion, and the manufacturing problem that stood in the way of the drop-ins was licked.


TATTOOING
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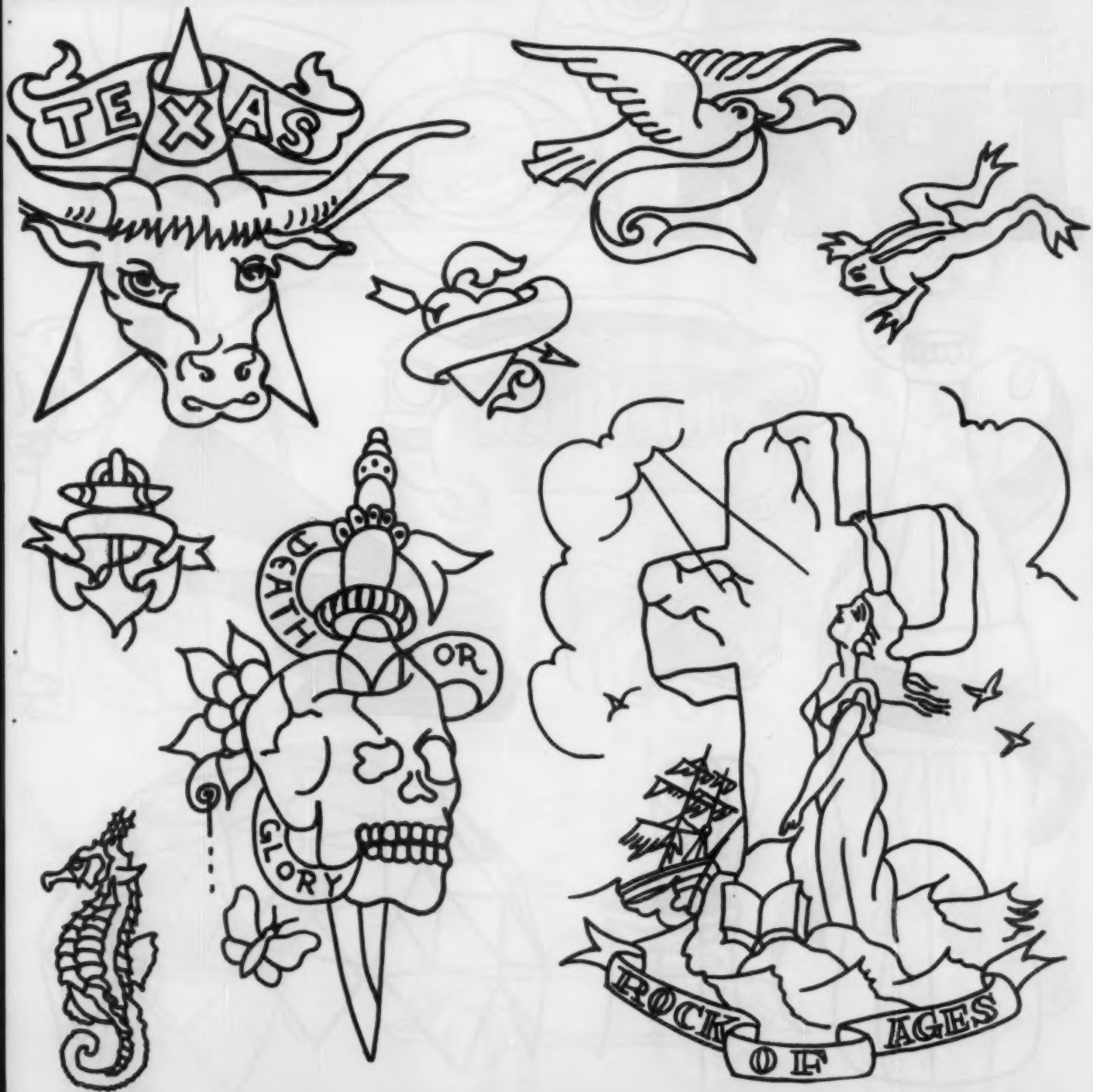
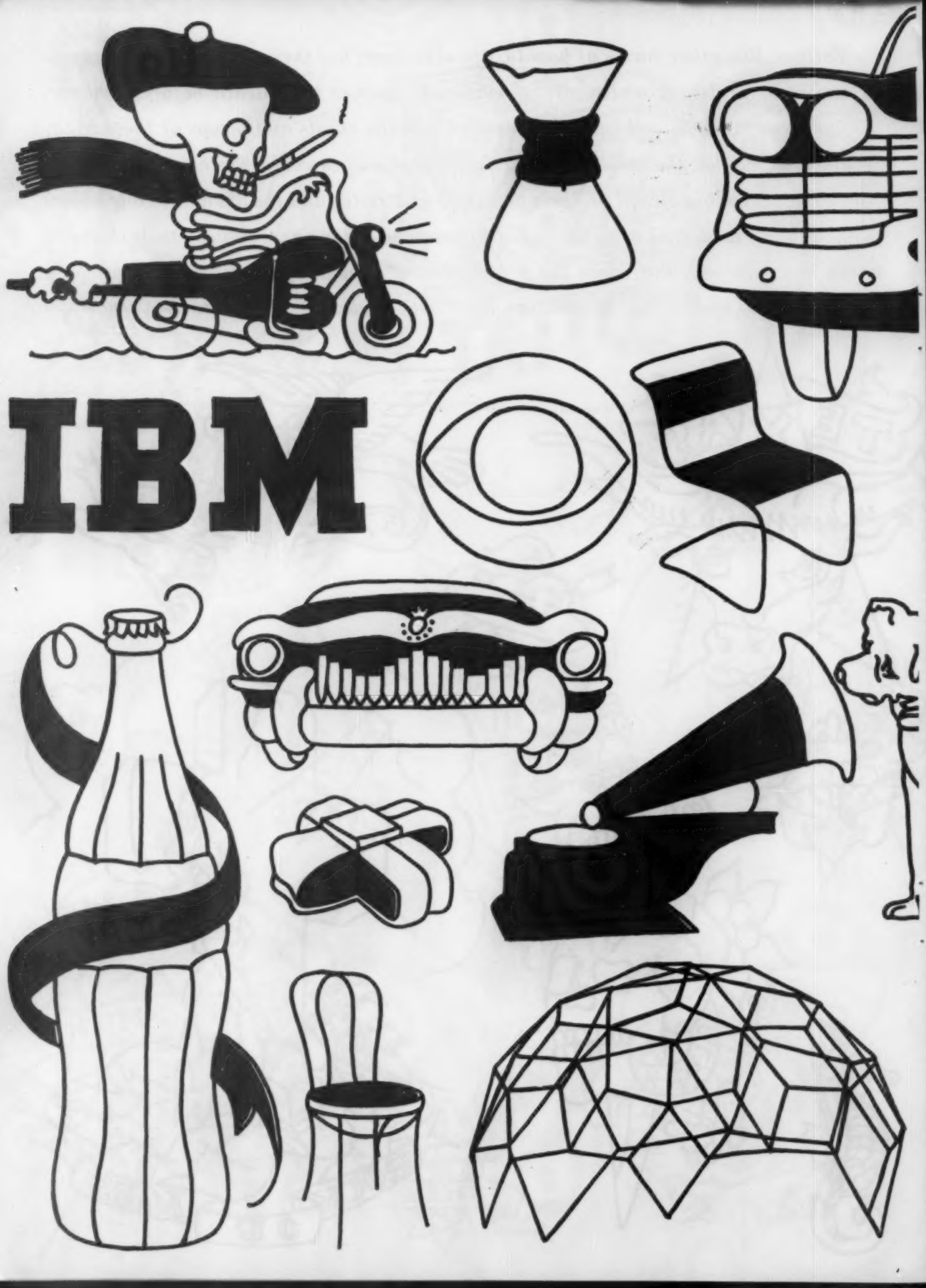
Tattoos, like other forms of beauty, are skin deep; but their design often expresses the most profound sentiments of mankind: mother love, death before dishonor, Slats loves Ursula—all have been needled into the chests and biceps of the daring, the sentimental, the vain, the forgetful (whose names would slip their minds if they weren't indelibly etched on their arms), the patriotic, and the drunk. No one knows how many industrial designers wear tattoos, and as long as they keep their shirts on no one ever will. But, since the art is gaining popularity, ID presents overleaf a selection of motifs that anyone can wear with pride. *Tattoo designs by Professor Zeis*




IBM


NAME

"The Brain"

by WILL BURTIN

Two years ago, Will Burtin designed a model of the cell which showed the basic unit of life in its three-dimensional structure — something that had not been seen before (ID August, 1958). Designed for The Upjohn Company as an educational demonstration, and as part of its unusual program for promoting its products, the cell model aroused world-wide scientific and art interest and is now on exhibit in Chicago's Museum of Science and Industry. Last June, at the AMA's convention in Miami, Upjohn unveiled another Burtin design — this one of the human brain. What is unique about this model is that, abandoning the usual anatomical approach, it demonstrates how the brain works in receiving, articulating and commanding responses to experience; and it incorporates some major discoveries made by brain scientists in the past five years. Burtin describes the design project below.

As everyone knows, scientific research and technology in all fields have moved ahead so rapidly that a wide gap has opened up between new knowledge and general understanding of it. In medical research alone, more basic new thoughts have been introduced during the last 25 years than in the previous two centuries.

A side effect of this stormy development is a somewhat uneasy awareness of complexities of which we were ignorant before and which can no longer be harmonized with traditional models. It appears, in fact, that much of the utilization of new knowledge, as well as further progress itself, may be impeded until new models of the newly-revealed reality are designed.

"The Brain" illustrates one approach to solving this problem. While there has been a rapid accumulation of data and subsequent expansion of our knowledge about the other organs of the human body, the study of the brain has often been hampered by the inability of both scientists and the public to free themselves from Victorian images and ideas.

Some years ago, while I was working with Dr. A. G. Macleod of the Upjohn Company on an article on the brain for *Scope*, the almost frivolous thought occurred to me that trying to understand the functioning of the brain by what one sees of its anatomy is as inadequate as trying to evaluate sculpture by looking at a sculptor's tools. Many months later—after reviewing the current scientific literature on the brain—I gradually developed an initial design which was not based on the anatomy of the brain but was organized around its functioning principles instead. The reasoning behind this concept was, and still is, that the anatomy and the fantastically complex chemical processes and interactions involved in the evolution of a conscious thought can be better understood and memorized if the functioning order is shown step-by-step. But this could not be done in the form of a text-book or two-dimensional graphs. This demonstration needed real space, and motion, and color. And it needed neutral forms serving merely to set a visual limit to what was happening inside them. Those stylized forms became, in the final model, the hemispheres studded with lightbulbs arranged in concentric patterns.

We decided to limit the demonstration of the functioning of the brain to the sensory mechanisms of sight and hearing, partly to allow for clearer organization and also because the findings in these two fields are more complete. The model's eyes and ears are placed as starting-points of the action. They are connected by light-carrying tubes, representing nerve pathways, to the various aluminum shapes which represent the essential functional parts of the brain.

The "consciousness screen" added in the upper center of the model does not represent a functioning part of the brain, but contains circular solar transparencies flashing at specific intervals which relate representational images to the step-by-step structure of an evolving thought, which we identified as "becoming conscious of a sensation." The aspect of time in the evolution of a thought is brought out in the order of the coded light impulses traveling over the nerve pathways. This temporal aspect of the brain, which is one of the chief features of the demonstration, was stressed as the basic principle by Dr. Herbert Jasper and Dr. H. W. Magoun, two scientists whom Dr. Macleod and I consulted throughout the development of the design. Dr. Wilder Penfield contributed decisively by his ideas and demonstrations on the significance of the centrencephalic system. The discovery of this system, less than five years ago, is probably the most important recent development in understanding the mechanism of brain action.

The audience, seated in front of the model, listens over earphones to a running commentary which describes four sequences of the brain's functioning. First, the model demonstrates the normal activity of the living brain, awake or asleep: outline patterns of past *visual* experiences (in red lights) and symbolic shapes denoting past *auditory* experiences (in green lights) keep continuously flashing over the memory cortices, to be available instantly once a specific thought needs them for definition. Their representational equivalents also flash in the consciousness screen (in color transparencies) and their sound equivalents over the earphones. The second sequence (in red lights only) shows how a visual sensation becomes a coded impulse moving via the nerve pathways between midbrain and cortices and back again, which is what

View of "The Brain" showing network of tubes and aluminum forms which represent functional areas of the brain.

happens from the moment one sees a singer perform to the moment one becomes conscious of her as a visual experience.

The third sequence (in green lights only) deals with the *auditory* part of the singer's performance. Coded impulses travel over the auditory nerve pathways to the mid-brain, the auditory cortices, and back to the mid-brain. This again parallels the real experience from the moment one is conscious of the special character of her voice and of what she is singing.

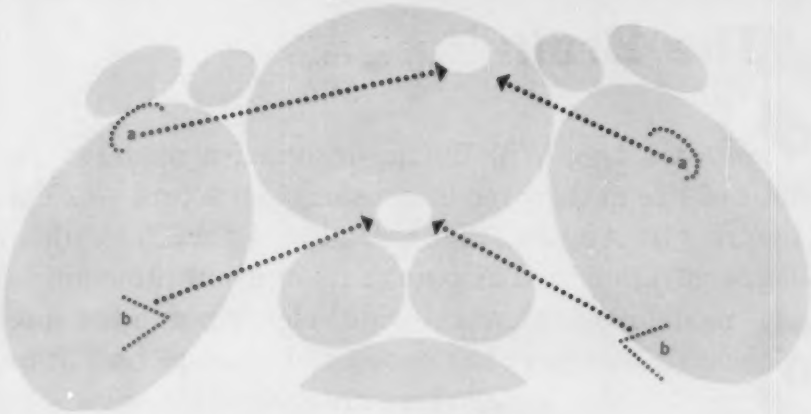
In the fourth sequence the full *visual and auditory* experience is coordinated in all its movements; but now impulses are sent from the mid-brain to the association cortices for comparison with similar experiences and affirmation of the individual character of the new experience. With the singularity of the singer's performance now firmly established, an emotional response occurs as a value judgment, indicated by the sudden emergence of white lights in the centrencephalic system. This sets off a specific action impulse to applaud, in the motor cortices of the brain, where white lights appear at the instant the audience hears applause over the earphone.

Technically, the 45,000 lights of the exhibit sculpture, with their 40 miles of wiring, can be organized to demonstrate a number of brain phenomena not possible in any previous model. We hope to demonstrate also the mechanics of certain brain malfunctions.

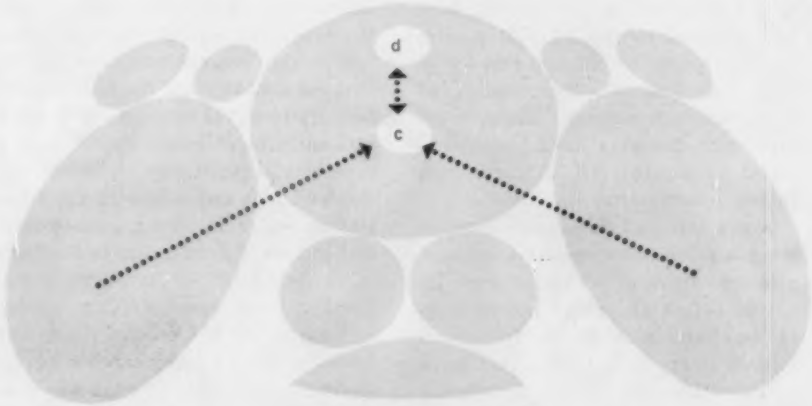
The differences between brain memory and the mechanized memory of computers, between the creative-emotional mind and machine efficiency, can also be shown, with benefit to our ideas about both. These possibilities are being studied at the present time.

In retrospect, the most profound experience in working on "The Brain" was the idea that the problem of how we think about thinking had become a design problem as well. In tracing the logic by which awareness of reality and dream is established, I felt often as if I were looking into the reasoning of creation itself.

The strong public and professional response to this two-year project proved the correctness of the original design concept. But without the devotion and confidence of my associates it would not have been possible to bring this assignment to its conclusion—a conclusion that already outlines new challenges.

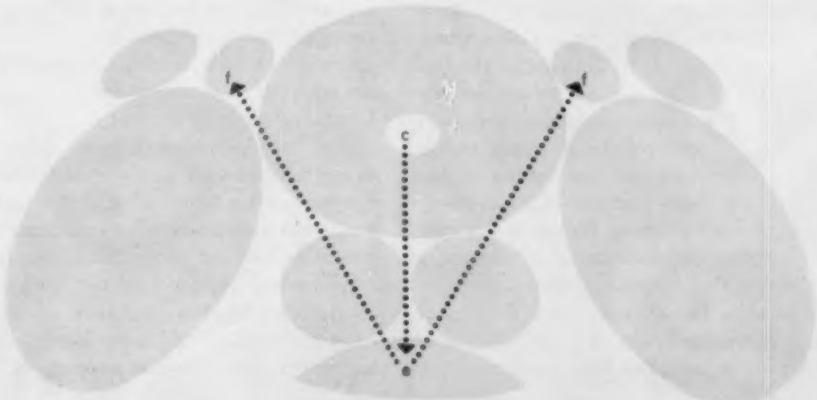


Non-representational patterns on large discs indicate random thoughts passing through brain's cortical and association areas. Brain is conscious of some of these (a and b), as indicated by representational images in the "consciousness screen" (rear top). Model's other parts indicate nerve pathways (tubes) and midbrain (dome on floor).



Here, a singer (c) has been seen and heard, and the brain is comparing her with memories of previously heard singers, in this case with a Wagnerian opera singer (d). Model measures 24 feet across the base, 12 feet in height.

The brain judges that the singer (c) gave a good performance and decides to applaud, as indicated by the glow in the center of the midbrain (e) and the lights in the motor cortices (f) which govern the applauding movement of the arms and hands.



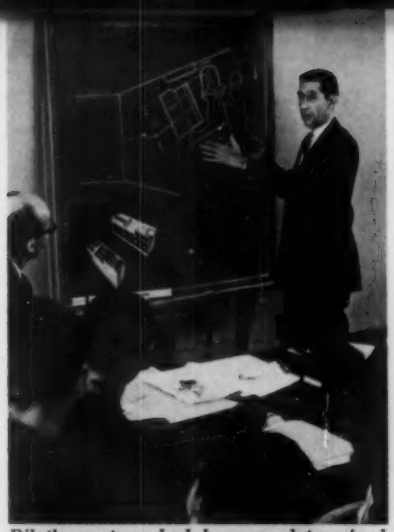
Student Project: Art Center *G. E. provides a realistic space-age assignment*

John Coleman (left) and George Beck prepare for presentation to class (below).

G. E. had prepared sketches for briefing.

The frequent lack of correspondence between the problems the young designer is asked to solve as a student and those he will be expected to solve later as an employee is an increasing concern of both the teacher and the employer. A good deal of the most heated discussion at the last meeting of IDEA (Industrial Design Education Association) centered around this question (ID, May 1960), and a growing number of company designers are cooperating with the schools in proposing projects similar to those on their own drawing boards. General Electric, which already has a design trainee program (ID, October 1959), last year cooperated with the Art Center School in Los Angeles in a student project which both company and school feel was extremely profitable, even though the profit is hard to measure exactly. (G.E. provided the time and experience of a number of its designers in preparing the project, and the plane fare for one of them, but no other financial sponsorship.)

George Beck, the manager of industrial design at G.E.'s Light Military Electronics Department in Utica, has had some experience in adapting design assignments to the student level: he has lectured at Syracuse and worked with the industrial design department at Pratt in previous years. Because he has hired a number of Art Center graduates, and has always admired the quality of work produced at the school, last winter he suggested to E. A. Adams, the school's director, George Jergenson, head of the Industrial Design Department, and John D. Coleman, head of product design, that a group of students might take on an

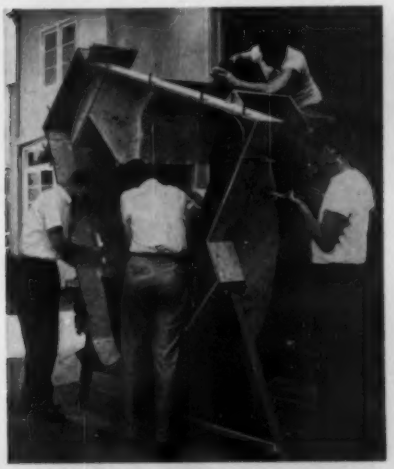


Pilot's posture had been predetermined.

Students and teacher check scale mockup (above), then plan final version (below).

Student traces outline of space capsule.

Whole team worked on building capsule.



Length of astronaut's reach is estimated.

experimental problem much like the ones Beck's own department is called upon to solve. In the first week of February he went out to Los Angeles, taking with him a carefully worked out assignment for a space vehicle computer and thermoplastic recording tape programmer.

Since Beck's department must work within extremely complicated limitations imposed by both the nature of the work and the special needs of the client, presentation of the problem to the students necessitated an unusually careful preparation. The G-E designers assembled a 9-page outline of the function and structure of a space vehicle computer and the human engineering problems involved when such a computer was to operate in a manned satellite. And to make absolutely sure he didn't forget any of his blackboard exposition—since if questions came up later he would be three thousand miles away—Beck had his department prepare a notebook of rough sketches to be transferred to the blackboard. The problem, briefly, was this:

The function of a computer on a space vehicle is to assimilate information received from the outside and to direct the vehicle accordingly. The computer is made up of a number of components predetermined by an electronic theory specialist who decides on the number needed to satisfy the special needs of the satellite's mission. In this case, the number of modules was set at 32 of equal size: 14 interchangeable modules titled "Logic A"; 6 titled "Logic B"; one called "Clock"; 7 called "Shift Register"; and 4 entitled "Servo". Packaged, these components would occupy $\frac{5}{8}$ of a cubic foot, to which must be added 12 cylindrical diodes and room to store replacement modules. Although the sizes of both the components and the space available to hold them was determined before the designers were called in, the space was sufficiently large to allow for a variety of arrangements, to be decided upon by the individual student designers.

The chief task of the designer in this assignment was to provide for the most efficient relation between the computer and the pilot, whose chief mission (for the purposes of the problem) was to locate and replace defective parts of the computer and, in case of emergency, to override the computer altogether and take over control of the satellite. The man, therefore, was necessary because the machine was fallible; but the machine had to

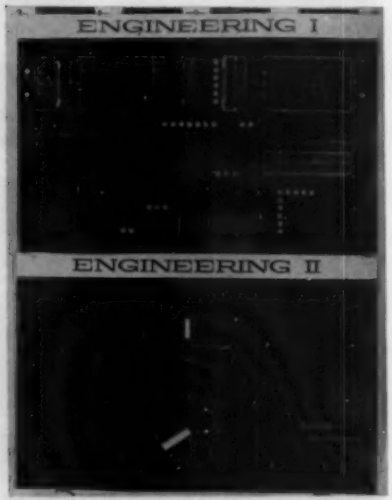
Mockup is checked for human engineering.

Stage is set for the final presentation.

Each student presented his own computer.

Astronaut Beck prepares for launching.

Renderings and schemes for one computer.



Hans Ansager explains his control panel.

be designed to allow for the fallibility of a pilot under extreme stress, when all his faculties might be dulled.

In addition to explaining the conditions of the problem itself, Beck advised the students of the importance of the presentation, which was, he said, as important in military design as in the design of consumer products. In the highly competitive field of electronics, companies often submit elaborate and expensive presentations to military customers. It is the designer's job to "sell" the proposals, and, even more than with consumer products, he must be ready to justify the logic underlying the design.

From the advanced design class that heard Beck's lecture, instructor Coleman selected a group of 8 to work on the project. Together they were to design and construct a model of the space capsule's interior. Independently each was to design a computer, or, more precisely, the physical structure that would hold the components in their proper relation to each other. The design had to permit easy removal and replacement of defective parts and provide for heat dissipation. Each student had also to design a control panel to contain the signals that would warn of module failure and the controls that would permit the pilot to re-program the computer or bypass it altogether. The panel was also to contain a switch for routing programs through parallel circuitry while modules were being replaced. The primary consideration in designing both computer and control panel was to be simplicity, and each student had to decide upon the most effective way of insuring against errors committed by a pilot whose sight or reason might be impaired by the strain of the experience.

The problem occupied 12 weeks. For the first six weeks, in simulation of the process G.E. would follow in preparing to bid for a government contract, the students prepared a variety of possible solutions which they gradually narrowed down to one each. The instructor's critique at the end of the sixth week represented the process by which the government awarded the contract—judging on the basis of the general design direction, not on the details of the design. At this point, the government would be expected to request a number of modifications, and the instructor here took the place of the Pentagon, proving to be even more exigent than the generals. During the second six weeks the students filled in the details of their individual projects

Beck gave students individual critiques.

Thomas Robbins hears Beck's evaluation.

Paul d'Entremont shows his control panel.

Students and their directors. Standing, left to right: Harry Loucks, Thomas Robbins, Coleman, Beck (seated in space capsule), Robert Reib, Edward Albright, Paul d'Entremont, and Hans Ansager. Kneeling left and right: LeRoy Cripps and Laird Pettit.

and worked together on the presentation model of the satellite interior.

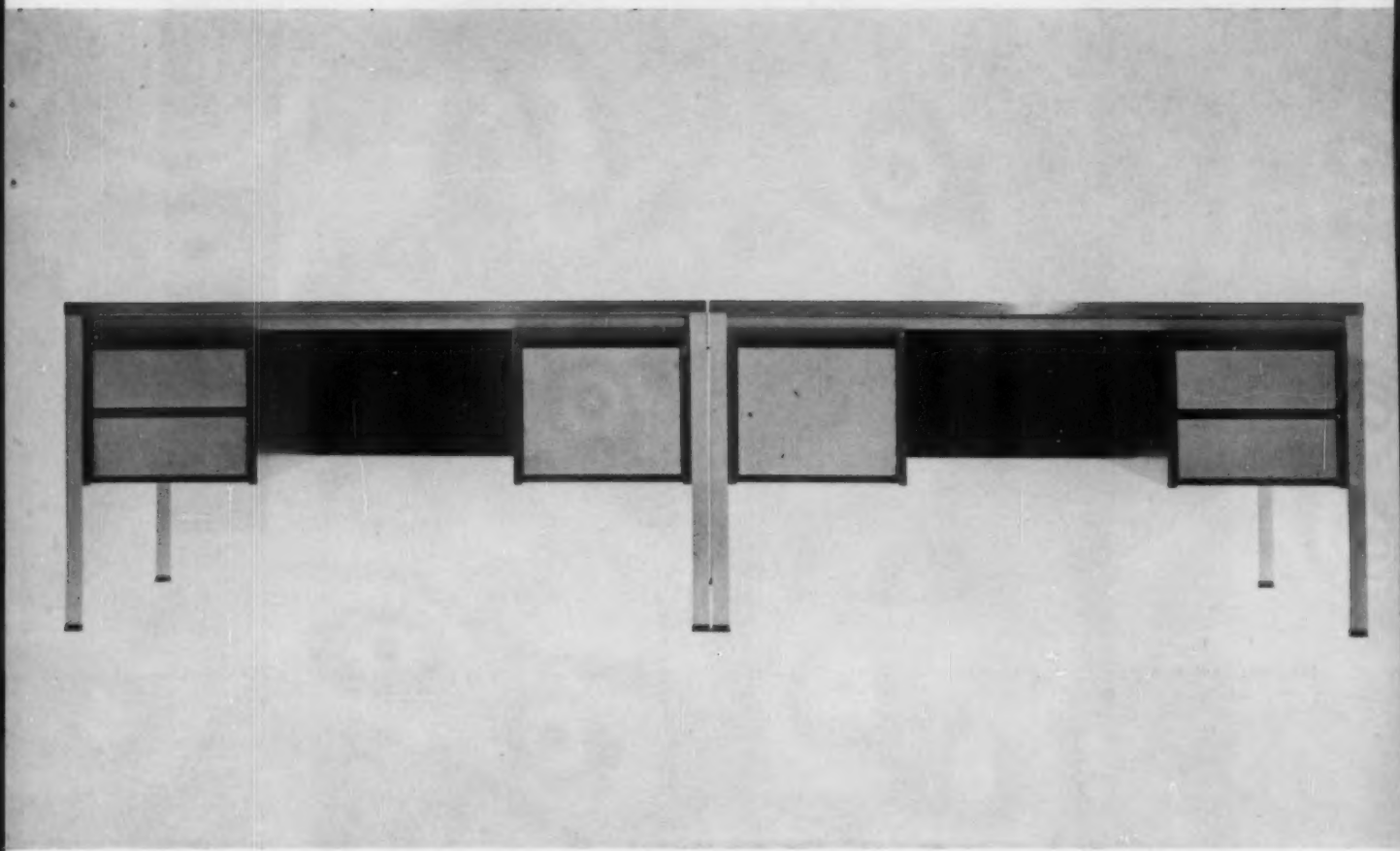
When George Beck returned to Los Angeles in May, he had had no intervening communication with the students, except for periodic reports submitted through the Art Center faculty. He found that the 8-man team had prepared one of the most elaborate formal presentations he had ever seen executed by either students or professionals. At one end of a darkened auditorium a curtain was pulled back to reveal a growing ribbon of light which gradually outlined the space capsule's interior. The ribbon was actually a tube through which a thread attached to a fluorescent cord was pulled. And the parts of the interior which had not formed part of the student's design problem were filled in with pegboard backed by a lamp, thus creating a pinpoint pattern of light.

One of the student-designed computers was installed in the mockup; the others were brought in as the students took turns explaining their solutions. Beck responded with individual critiques, which he followed up later with letters. He was especially impressed with the human engineering embodied in the students' solutions; and he found, too, that the designs exhibited a freedom in their approach which is often absent from the designs of professionals who are well acquainted with the specific demands of the problem. Naturally, the students had not worked closely with an engineering department, as G-E designers do when they are faced with a similar project, and also, of course, they had no access to classified military information, which might have delimited the problem still more clearly for them. (They supplemented this lack of engineering collaboration as best they could—one student had an engineer brother, whose electronic counsel aided the whole group.) In all other respects the assignment approximated an actual project. G.E. emphasizes that it was only an approximation, however, and that the company neither intended to, nor was able to, use the students' work for its own purposes.

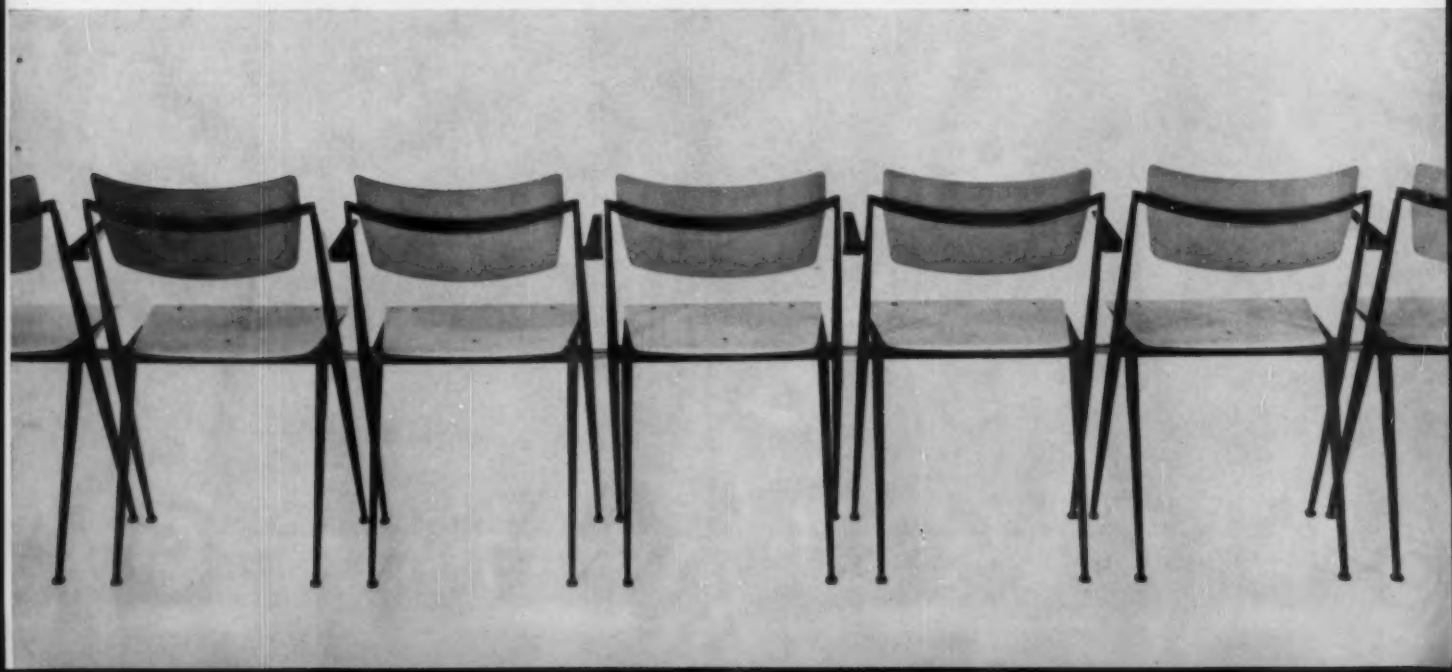
Although Beck says that he did not look on the project as a try-out assignment for prospective employees, one of the students, Laird Pettit, is now a member of Beck's design staff in Utica. Both G.E. and Art Center were pleased with the results of the experiment; the school has asked for another project, and Beck wants to give them one.—*U.McH.*

The **Triennale di Milano** *will — for the first time in the history of this sprawling, scintillating international design and architecture show—stick to a single theme: the school and the home. Besides bringing order into the thematic chaos of the exposition, this plan has a practical advantage—some of the model schools will later be constructed in Milan and Genoa. But a number of individual exhibits will still escape the main theme, and the most important of these are two memorials to Adriano Olivetti and Frank Lloyd Wright. The keen rivalry which the show encourages among Italians transforms its Palazzo dell'Arte into a new and unpredictable piece of architecture every three years. But about the unpredictable show itself, one thing unfortunately can be accurately predicted: the United States will not be there. Although Alcoa has sent over an aluminum house, which Walter Dorwin Teague has furnished, there will be no official government-sponsored American exhibit at the Triennale* (*see editorial, page* 39). *What the* 15 *other participating countries will show in their national exhibits is sampled here, and next month ID will bring a full, on-the-spot report of what this Triennale may mean both to industrial designers and to the entire field of industrial design.*

Poland: *small chair of laminated wood by Jan Kurzatkowski from the Academy of Beaux Arts in Warsaw.*

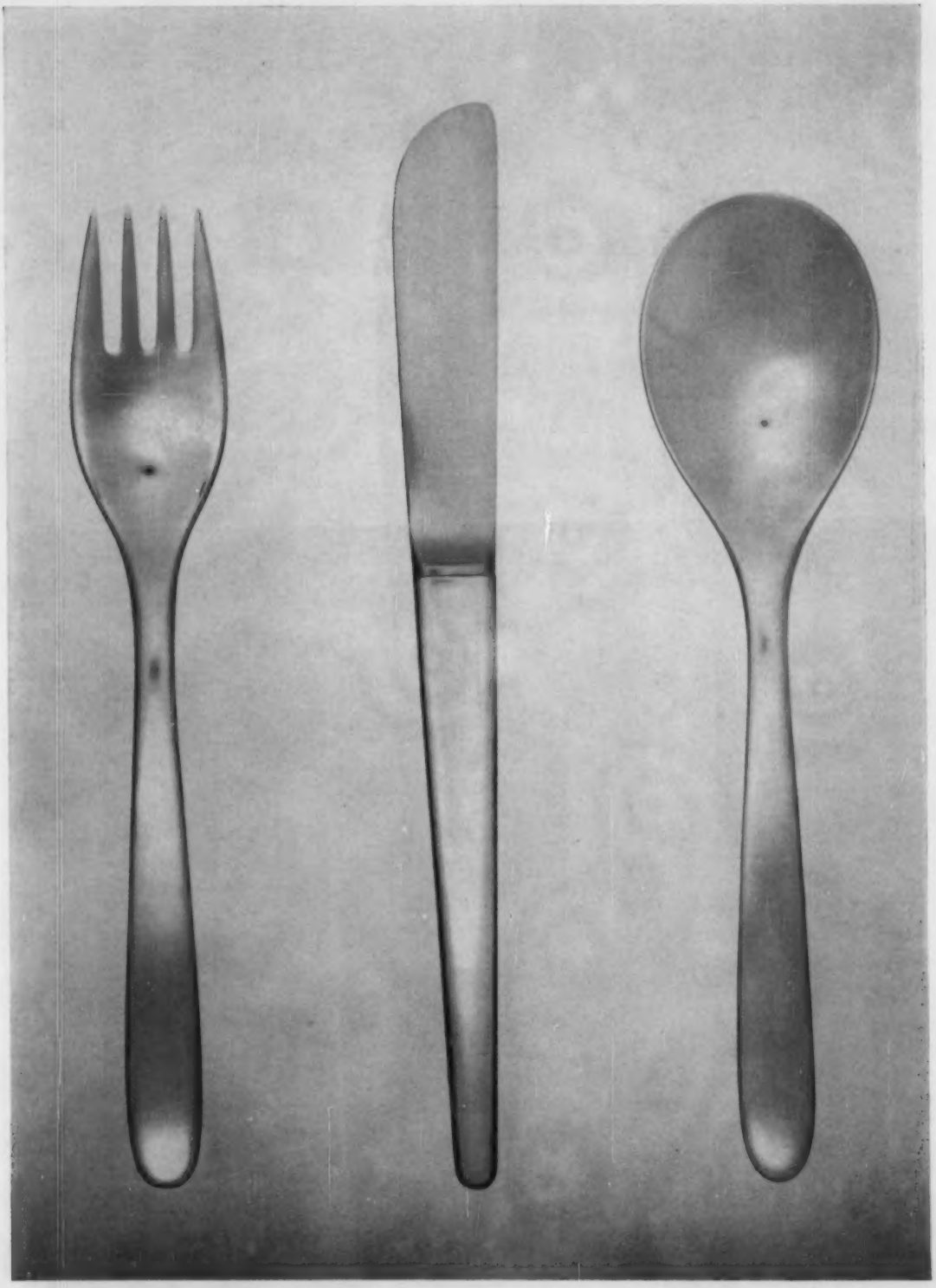


Holland: *Steel theatre chair designed by William Rietveld for Ahrend-Cirkel (below); office desks by Coen de Vries for Lips.*

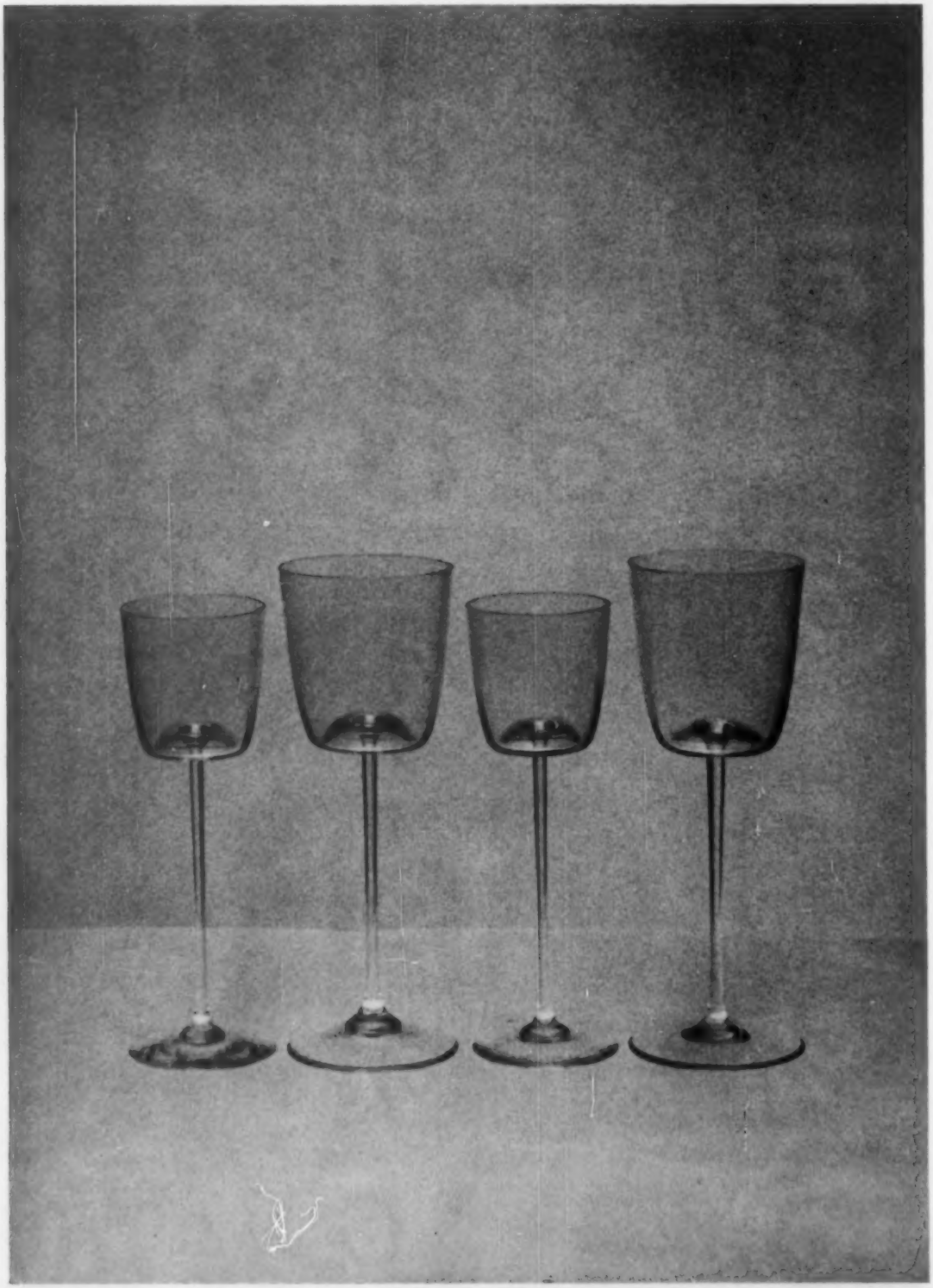


Finland: *Cast-iron frying pan with enamelled exterior and detachable handle, Timo Sarpaneva.* **Norway:** *chair by Tormod Alnaes.*

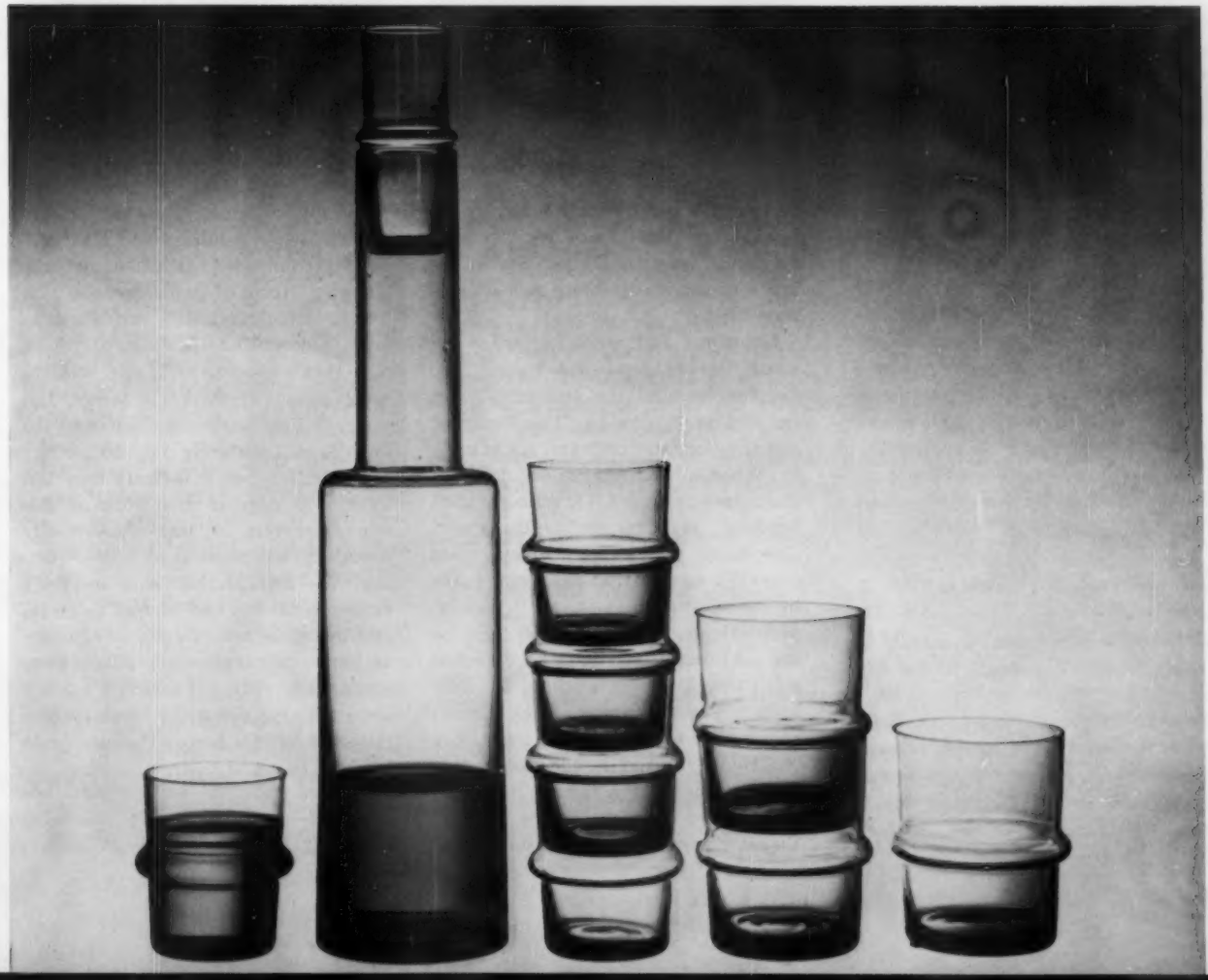
Germany: *Silver-plated steel flatware designed by Ernst Moeckl for the Alpaccawarenfabrik, Bavaria.*



Austria: *glassware designed by Professor Alfred Soulek for the Tiroler Glashutte Klaus Riedel KG.*



Denmark: *decanter and tumblers (below) by Christer Nilsson for Holmegaards Glasvaerk.* **Sweden:** *Glasses by Nils Landberg for Orrefors.*



Report on Aspen

By JUDITH RANSOM MILLER

After ten years, the International

Commentary: *Mrs. Miller found this year's conference skimpy in attendance and somewhat diluted in spirit; it tended to substitute an alternate theme for the one assigned—but it did at least thoroughly explore the substitution.*

As though completing a circuit, the 10th International Design Conference at Aspen returned this year to its first topic: The Corporation. The printed program wore an elegant overgarment, "An Inquiry into the Opportunities and Limits of Action for Innovators in the Twentieth Century Technological Society," over the old hair shirt, "How Can the Designer Get Himself and His Services Recognized and Used?" The prickly conference problem of how to get off and running—and in which direction—was still present. In 10 years no built-in direction-finders or saddle burrs have developed. Attendance seemed smaller this year, and less international. For sure (and sadly), there were fewer students. The atmosphere was noticeably tamer, countries other than Germany, Sweden, England, and the United States being conspicuous by their lack of representation.

Fine

Questions and answers tended toward the anecdotal—the topic, "The Corporation and the Designer," was reduced very soon to "The Designer and the Corporation," and specifically to "What is the route for the designer (i.e., me) to take to connect with top-level management?" Designers, like many a consumer today, seem generally agreed that they would like to "speak to the manager." Gently, persuasively, George Culler guided the conference, his habit of detached politeness infecting all but Mr. Parkinson. The machinery of the conference was not as evident as usual. For one thing the public address system worked consistently, though it seemed hard on the English accents present. Visual materials were in short supply—certainly several steps behind those of the 1959 conference.

The topic, "The Corporation and the Designer," chosen in June, 1960, might have been set up as a memorial to the late Walter Paepcke; one felt his presence all through the week. The usual three cycles revolved around I: Corporate Identity, II: Design Identity, and III: the Future of Design in a Technological Society. Each new cycle drew in the concepts and data of the earlier as it spun around, and as always there were tendencies to make the subject centrifugal or to reduce its circumference.

The heroic scholars and personalities of earlier conferences were simply not present: no Walter Packard, no Chakravarty, no Roman Vishniac. The pungencies of men like John Kouwenhoven, C. Wright Mills, Lancelot Law Whyte, Misha Black were noticeably missing. The two men nearest to these were Paul Fine and Vernon Welsh. The clarity—but not the truth and significance—of Fine's message suffered by repetition and over-extension. Vernon Welsh, at the other extreme, buried great power and an important message under a mild manner. Again, on the problem of clarity, C. Northcote Parkinson's wit managed to smother much of what he had to say. As a case in point, when asked the question, "How can designers achieve recognition and status?," he recommended abandoning the American form of government in favor of monarchy. His explanation: When Queen Victoria declared, "Rise, Sir Edwin Landseer," one had to accept the fellow. Very funny, but does this example demonstrate the pitfalls of legislating (or decreeing) gentility, or does it indicate that Mr. Parkinson admires the work of Edwin Landseer, or was there really meant to be a point at all? Traditionally, the English humorist used his rapier to cut out and correct (a clean, and therefore a kind cut), or to make an unpleasant truth acceptable. At the conference Mr. Parkinson's wit seemed to cut down the inept presentation of an idea before the idea could be fully heard.

But in spite of—or, perhaps, because of—the undramatic character of this year's conference, an impor-

tant question emerged, and with it some practical interim procedures to apply toward answering it. The question: How can the design profession become recognized as a profession? The answer: By *becoming* a profession. A succession of related questions followed: 1) What is a profession? 2) What then is design? 3) What is a designer? 4) What is the design profession? training? future? 5) Very well, then, what do designers do to weld design into a profession? 6) But *how?* Branching off from these were corollaries: 7) What is corporate design? 8) What is creativity? 9) What about communications?

As the conference moved toward summation, points of view seemed either to converge or at least to show inherent similarities. Concurrently, viewpoints of conferees and panelists moved from the particular to the general. By Thursday, both Traugott Malzan and Eliot Noyes realized that beneath the surface of their differences of opinion there was general professional agreement. The issue of profit *vs.* social obligation was never resolved beyond a certain point: a recognition by corporation representatives that the corporation has a responsibility both to investors (who have a preference for a return on their money) and to society—providing that meeting the latter obligation does not put the former in jeopardy (because this would put the latter in jeopardy). In this connection, Paul Reilly expressed the hope that the time would come when no one would make or sell that to which he would not give houseroom.

Noyes

On Monday, Traugott Malzan spoke sharply to the designer, pointing out that he "expects to be treated differently from anyone else, and expects people to buy what he has to sell without knowing anything about it." On Tuesday, Paul Fine spoke philosophically to the corporation and the designer, "If you seek directly, you do not gain your objective; approval is a by-product of a job well done." The same day Blair Gettig pinned down a major problem of designers with this comment: "You should distinguish between methods of communication and avenues of approach." On Thursday, Paul Reilly, the Council of Design's gentle blackmailer, declared, "The real Everest to be climbed is that of solving human problems and making the world a fit place." Finally, on Friday, Vernon Welsh put the designer to rest with, "The principle of anonymity is profound. Creative people express themselves through work, and wish to be judged by their work. The corporation is the personality to be projected. The work performed is testimony to the type of man you are."

Panelists: *Aspen's* 1960 *roster included a humorist-economist and a communicator, and its overseas representation was drawn from England, Sweden, Germany and Malaya.*

BILL TARA *Chairman, Executive Committee; Graphic designer, illustrator*

GEORGE CULLER *Program Chairman; Associate Director and Director-elect, San Francisco Museum of Art*

JOSEPH MCGARRY *Vice President, Public Affairs, International Minerals and Chemical Corporation*

SPENCER STUART *Spencer Stuart & Associates, management consultants*

LESLIE JULIUS *(England) Director, S. Hille & Company Ltd.*

DR. TRAUGOTT MALZAN *(Germany) Head, Communications & Design, Radio, Phonograph & TV Department, Max Braun*

ELIOT NOYES *Eliot Noyes & Associates, industrial design*

OLLE EKSELL *(Sweden) Graphic designer, journalist*

CRAIG ELLWOOD *Craig Ellwood & Associates, Architects*

BLAIR GETTIG *Advertising Program Director, ALCOA*

PAUL A. FINE *Vice President, Center for Research in Marketing, Inc.*

C. NORTHCOTE PARKINSON *(Malaya) Author,* Parkinson's Law and Other Studies in Administration, *Raffles Professor of History, University of Malaya*

VERNON WELSH *Consultant on communication*

PAUL REILLY *(England) Director, Council of Industrial Design*

Nine questions: *One topic dominated the open discussions—how to gain recognition for design as a profession. No final answer emerged, but the question itself spawned nine subsidiary questions with many answers. A cross-section of quotations is given here.*

1. What is a profession?

PARKINSON: *Design is not a profession; it is not within miles of being a profession. Professions are organizations attracting loyalty and practicing ideals of public service, internal discipline, training and education — there is a minimum emphasis on fees.*

McGarry

FINE: *Professional organizations are sometimes stultifying. Professions can be saved by ideals. Norms and standards are not the same as ideals. You cannot take the average as the ideal. You cannot define health by the average. Professional standards must encourage something beyond what anyone in the profession now has.*

PARKINSON: *The scientists' success is due to the fact that broadly they agree with each other. Designers are not agreed.*

2. What is design?

MALZAN: *Technical qualities in useful products must be paramount to esthetic values; esthetic values are a final, not a primary, aspect. The useful object as a personal monument for a specific designer, we seek to avoid—it might become a nightmare for the housewife.*

MCGARRY: *Design is a means of solving a problem. Buildings speak for the kind of company you are—buildings, graphics, and so forth are a means of trying to say something.*

MALZAN: *Design is never an end in itself. Design is a means to what end? I have a faint suspicion that we are talking about the "looks" of something when design should be concerned with the human relations within the company, and outside. The facade—the planting of coreopsis in the front yard—does not change the product.*

PINZKE: *No precise definitions fit the evolving character of design activity.*

NOYES: *Design is a specific branch of engineering. Design is making a product look like what it is. Eames said, "Designing to sell is not our dish. We are stubbornly uninterested in the new. Our job is to see that the consumer gets the best value the designer can deliver." Is that good for the corporation? It is the only thing that is good for the corporation—tough-minded integrity . . . In aiming at sales, many a design program fails.*


Malzan

WELSH: *The nuclear-powered submarine or Atlas missile are designed for performance; graphics are designed for acceptance, persuasion, delight.*

REILLY: *Design is intelligence made visible.*

WELSH: *Design is now the hopelessly degraded child of evil in a universe of malevolent intent. You must have a desire to act, not talk, for people's good. Content tells more and does more than the fastest information device. What is required is not verbalization, but an action statement to improve the state of design.*

3. What is a designer?

NOYES: *The architects design things about buildings because they tend to think in terms of relationships. I rather welcome the invasion of architects into this area of design. I don't much care what label is on someone who designs something. Architects and industrial designers should not be at each others' throats, but should be close together.*

FINE: *The designer is in part an artist—he is the sensitive segment of society—therefore his function is to perceive human need so that others may act. Insofar as you are sensitive, you open up the possibility of others becoming sensitive.*

GETTIG: *Poor design is the responsibility of the corporation; good design, we like to think, is the responsibility of designers. Actually, poor design and poor taste are the responsibility of the design profession. What is needed is clarity and understanding as to who is a designer, and who is not. The corporation has no way of knowing.*

WELSH: *The designer we are talking about is peripheral to the man who has the responsibility to see that the Atlas missile makes its mark. The corporation isn't going to have a magnificent cultural program if it blows up.*

MCGARRY: *We've learned something about designers by using them. We had the designer for a specfic problem; actually his span of imagination and thinking was far greater than the problems at hand. The man represented to us as a specialist is, fortunately, a generalist.*

NOYES: *I am inevitably a part of a company because of the amount of time I work with them, but my absolute independence I must have. In my particular case, staying out allows me to say what I mean to anyone. I will never subject myself to the sales department's point of view, nor can I be overruled, nor can I be shut up. You can never tell what you may run into, no matter how good the climate. If you're working outside, you tend to have a broader range of activities.*

GETTIG: *The designer must be trained thoroughly in technology and economics, oriented to the needs of the corporation, susceptible to the uses of market research, and able to synchronize these. Management expresses concern over the designer's lack of attention to technological aspects, production techniques, the market situation. The industrial designer need not become an expert, but he must rely on what is available in the complex corporate situation. A lot of people have the answers, but not in context.*

EKSELL: *The biggest mistake the designer makes is that he thinks he is a businessman and forgets that he is an artist.*

MALZAN: *The designer is just one, and not even the most important, part of industry, and therefore has to comply with the rules that rule the industry. The designer has to understand corporations, and in that way understand what he has to face. I've heard the word "creating" a little too much, with too much of esthetic quality. The designer has the responsibility to improve the product in its function, make it less expensive, more efficient, better looking. I don't believe that freed creativity will lead us anywhere; it will lead us into chaos.*


Julius

NOYES: *You hire the designer for some kind of vision; other things can be supplied.*

REILLY: *How to humanize the technocrat is one of the designer's roles.*

JULIUS: *Robin Day says he will not hire other people because he says his job is designing. If he hired other people, his job would be hiring other people.*

4. What is the design profession, its future, its training?

CULLER: *The design profession has been advised, it appears to me, that its members must have been educated at the Harvard School of Business, must join a young revolution, must have had business experience, must organize, must put its moral house in order. What now? We have been busy pumping used air into Aspen's clean air. Have you suggestions to put to the corporations?*

MALZAN: *In a very short time, if it is not true already, there will be no company that cannot afford to educate young people. If only you have learned that apprenticeship is not the way to do it, that is quite a lot to have learned.*

GETTIG: *The problem is to find the*

man, and clarify the service or contribution of the designer, then to follow this by understanding throughout the corporation. He must have the endorsement of management, but not necessarily working relationships with it.

NOYES: *There are tremendous shortcomings in the teaching of designers: design is taught as a commercial service rather than as something with broader significance.*

FINE: *Psychologists, scientists, and designers are handmaidens to purposes alien to psychology, science and design. For designers to remain true, they must have respect for their objectives, and for the public.*

JULIUS: *Designers, your power is increasing! You are going to suffer from power. Power corrupts, you know.*

5. What do designers do to weld design into a profession?

GETTIG: *The design profession, as a profession, has done practically nothing to make itself known—no effort comparable to that of the AMA for medical men. This design conference is a case in point. There is no real effort to report to the press. There is nothing underhanded about publicity.*


Reilly

Someone's talking; why aren't you? If ethics prevent you from speaking individually, there is nothing to prevent you from speaking as a group through your associations. I assume that you all come here because you have something to say, and that you would not be ashamed to have others hear it. Not all the people you want to reach are here at Aspen. Unless you come back into the 20th Century and use some of the modern techniques of publicity, information, propaganda, all you are doing is taking in each other's wash. In almost every business contact you will make, there is a man who doesn't know what a designer is or does, and doesn't know why he should pay good money for his services. Your job will be easier if you


Welsh

can make your case to him frequently and forcefully.

ELLWOOD: *Designers have used the individual approach rather than the group approach to the problems of the profession. Designers communicate with each other, but what about articles for management, educators, and others? Designers should tell their story in print to other professional groups.*

WELSH: *Designers are not bold enough. Be bold. There is an ally inside. Study the corporation, and study for communications. You won't get anywhere saying, "You are a menace to society; I would like to have a job." Study the dress of our technological society. Be tolerant enough to see the corporation's problems.*

PARKINSON: *The problem is how to find a common idiom with room for both agreement and disagreement, a measure of agreement and disagreement, a measure of agreement beyond which there is room for idiosyncracy. A sonnet is an exacting form, yet great variety and quality are possible.*

6. But how? What is the machinery for organizing?

PINZKE: *There is no single coordinating organization throughout this country.*

EKSELL: *There should be an association to take care of designer services. In Sweden, we have such an association; Swedish industry asks for the designer from the association.*

REILLY: *The Council of Industrial Design was formed in 1944 following two inquiries, one by the government and one by the Design and Industries Association (a voluntary organization). CID was authorized by the coalition government, fortunately. The designer is better considered today due to the good work and propaganda of the CID.*

PARKINSON: *In order for the resolution to organize to emerge, a common denominator is needed: money. Use a foundation, such as the Rockefeller or the Fund for the Republic, but develop things so* they *will suggest it to* you. *The attitudes of those who show so little desire to coalesce will be changed by the honeypot.*

7. What is corporate design?

STUART: *A happy accident resulted in the selection of a design consultant. The problem of a point-of-sale display resulted in a design program for the entire company. Good corporate design results when the president is young and turns outside corporation ranks for design initiation, and when the idea of the program develops from a small project which puts the whole program in focus. The advent of the design program frees the entire staff, down to secretaries, to accept change.*


Herbert Pinzke

I disagree totally with anyone who says good design is not good business. The problem is that management—the president—has not been given a comprehensive understanding of what good design can do within the company, and outside it.

MALZAN: *It is extremely difficult to get a company of great volume to see that they should apply high standards, that they are responsible to consumers, their own staff,* and *their own stockholders. Small leaders force big companies to change whole programs —internally as well as externally.*

GETTIG: *The ultimate objective of the corporation is to show a profit. It is a business enterprise, not a social institution. Of course I don't deny that corporations have other respon-*

sibilities to their customers, their employees, and to the world at large.

Good design—really good design—can help a corporation achieve anything it wants to achieve, including profits. The greatest single problem in corporate design is to get the corporation to realize that there is a problem. There isn't much of American business that knows or cares what you have to offer.

NOYES: *The major difference between my role and that of others is that I am not sympathetic to the idea of a theme or corporate image. You do not want a corporate image, you want an attitude.*

The corporation does not hire the designer for a specific job at IBM. We are part of a team responsible for bringing along a product. There exists a direct communication between the elements of corporate structure and the design teams. We hold a seminar on our problem. IBM's organization is set up so that communications and design managers meet regularly. We decide our own program.

FINE: *There is room for the designer because the corporation needs him, because the corporation is getting out of touch with reality, the world, even with itself. The designer is one who remains in touch, who has a little more foresight and vision than the man in the corporation. A rediscovery has to come from people not caught up in the rat race. To achieve this the designer must maintain independent perception.*

Gettig

PARKINSON: *The corporation is not static. Its purpose is plastic; its nature is essentially biologic. It grows, springs up, branches out, multiplies.*

MCGARRY: *Grows, turns green, dies first at the top—as do trees. As individuals, we business men are quite creative—artists in business. Creativity is not limited to designers.*

NOYES: *The words we use have a way of affecting our actions; for example, "corporate image" suggested the need for corporations to think in big terms about design—a slip cover for external appearance. I suggest we kill this phrase and substitute "corporate design"—design in far greater depth.*

8. What is creativity?

MCGARRY: *Creative people have an inability to sell themselves; they present an idea with a burst of enthusiasm followed by a burst of humiliation. Lost time, lost pride, lost ideas! Most of you are imaginative, but you don't push ideas through and sell them.*

Culler

FINE: *Creativity means utilization of the man beyond the task he has to perform. In a bureaucracy (army, government, or corporation) men learn to play the game; this puts severe limits on creativity. If you are going to be a man, not a function, you are going to meet trouble.*

STUART: *There should be a vice president or manager of communications to help young people with creativity function within the managerial strait jacket, i.e. "corporate discipline." The corporate organization is a plastic affair, capable of adaptation to new conditions, perhaps to new people, but it does not exist for the purpose of allowing people to perform to the full measure of their capacity.*

ELLWOOD: *If we surrender ourselves to the corporation, we cease being independent creative designers and are subject to petty prejudices, politics that exist within corporations. The corporation executive eats, sleeps, and drinks corporation. I prefer to eat, sleep and drink design.*

9. What about communications?

MALZAN: *You can't expect an empire—which is big business—to make a dive from the 15 metre board just to see what would happen.*

GETTIG: *Today we find businessmen who are so anxious not to be considered square that they buy design with no validity, and designers needlessly compromising in their effort to have it understood that they understand.*

MCGARRY: *The designer attempts to make communication by way of sketch and mock-up to a management which is not an equal (at least in this area of competence) and is therefore full of anxieties.*

EKSELL: *Design is not part of the general public's education, as is science, where there is a general public understanding—or at least, trust and respect. Management is unequally educated; for that matter, even designers do not know what design is.*

WELSH: *Communication is not understood. When top management does understand, then there will be a demand for it.*

FINE: *We have vast communications systems and very little is communicated.*

REILLY: *I suggest seven T's for designers: talent, technique, taste, tact, tolerance, tenacity, and tongue. If you will not speak out for yourselves, no one else will do so.*

MCGARRY: *The designer sits around the table with us to solve problems. Since he must know the frame of reference, we brief him thoroughly—show him films and photographs, fly him to the mine. We expect independence of thought, imagination, drive, and communication. And the process of problem-solving is more effective when the communications man is one of the group. It takes toughness to sell an idea. Basically I'm a communications man's interpreter—to the company, to the press, to every employee.*

GETTIG: *Communications must be carried out on a continual basis. I am talking about the necessity of explaining and clarifying certain things that are so obvious to you that you do not realize that they are not obvious to the rest of the world.*

FROM THE FLOOR: *How can we break down the corporate fear of the artist?*

PARKINSON: *Make the artist respectable, perhaps by knighting him. If you were to give up your republic and become a monarchy, it would be possible to bestow respectability royally.*

Parkinson on design: *One of the most provocative papers was C. Northcote Parkinson's. Postulating a Parkinson's law of creativity, he suggested that genius flowers in direct ratio to the amount of professional discipline present. Following is an excerpt from his paper.*

The first thing I have to say by way of personal message is that your work, as designers, is supremely important. The American scene is (to put it frankly) a mess. There is a growing tendency for people to look at the environment they have created for themselves, turn to the designers, and ask, "What are we to do *now?*" This question is seldom asked until the situation looks hopeless, and the designer's first instinct is to suggest, "Why not sit down and cry?" But while the difficulties of the situation are apparent, so are the opportunities. It is cheering, to begin with, that we should be consulted —that the need for our services should be felt. It is also apparent that the technology which has created chaos is equally capable of creating order. There is a whole world to redesign—our cities and streets, our shops and offices, our homes and gardens, our tables and chairs, our pots and pans, our plates and glasses, our knives and forks. The one thing we do not lack is opportunity.

Parkinson

But are we in a position to seize the opportunities when they arise? Do we have the prestige? Will people heed our advice? Are we high enough in the organization to make our view heard? To all these questions the answer is emphatically, No. As things are, our status is relatively low, our prestige uncertain, and our advice too often rejected. Why? Because of a lack of discipline among ourselves. The status of any profession is reflected in salary scales, fees, social esteem, and public respect. On his own subject, the engineer, the lawyer, the surgeon, the banker, the dentist, is listened to with rapt attention. Why? Because of the training he has undergone? In part. But there is something a great deal more fundamental. Behind the training, and behind the professional discipline is a broad agreement on essentials. Members of the same profession will give the same answers to the same question. "What is the bearing load of this girder?" "Has this child got appendicitis?" "Is this agreement legal?" "Would this be a sound investment?" "Should this wisdom tooth be extracted?" Generally speaking, the same question addressed to different members of the same profession will produce the same answer from each. And the public esteem in which the profession is held depends to a large extent on this being so. If each lawyer, each banker, were to give a different opinion, I should rapidly conclude that my opinion is as good as his. Why should I pay for contradictory advice? What I *will* pay for is the advice of a whole profession, as applied to a particular problem and as uttered by an individual practitioner.

If we apply this sort of standard to past periods of design, we shall generally find that the level of excellence achieved is closely associated with a standardization of work. When all houses were Georgian, when all gates were of wrought iron, when all chairs were of mahogany, the same problem was tackled in the same way and this way was assumed to be the best. This is a doctrine which conflicts with the role, you will say, of individual inspiration—and indeed it does. On the one hand you have the claim of professional discipline. On the other hand you have the claim of the individual artist. The choice lies before you: the likelihood of being listened to, as against the artist's freedom to express himself. It is for this conference to move in one direction or the other. My advice, for what it is worth, is to move rapidly toward the establishment of a professional discipline. For giving that advice, I have three reasons.

1. Genius will emerge most readily from among a group of able people all doing roughly the same sort of thing. Johann Sebastian Bach was such a genius, his background a whole generation of musicians whose technique was basically the same. He did not tower above the rest by doing something different, but by doing the same thing with an intensified ability and vision. Genius, by my definition, is the confidence of outstanding ability with vision.

2. Genius is extremely rare. If all our designers had genius there would be something to say for avoiding all professional discipline. But our designers are mostly quite ordinary people, lost if they are given too much freedom. They would be far happier in adapting an agreed style to a paritcular problem.

3. Life is too short. An architect should not have to invent a new architectural style for every building he designs. There isn't the time, and there isn't the money, and it isn't what the client wants. He is far more efficient and happy when working within the framework of an accepted style. The same is true of any designer.

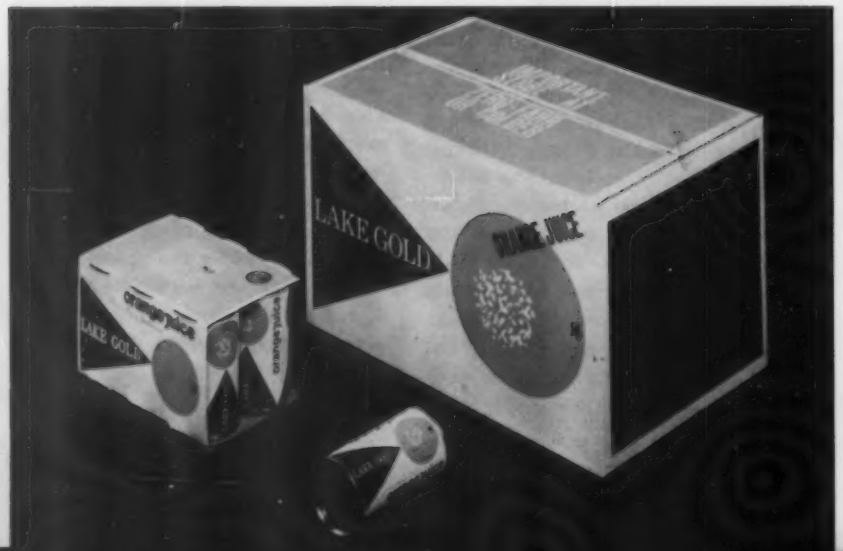
When asked to design a chair, he shouldn't sit down and gaze at the sky, saying, "What is a chair? What are the *elements* of the problem? What is the true philosophy of chair-making?" It all takes too long, and costs too much, and the result is horrible anyway. Better to agree together on what a chair is. At the end of it, one designer will obviously be better than another.

At this point I make an end. My counsel to the designers of the world is to make their art a discipline, train their successors in an accepted tradition, set their professional standards, and establish their professional examinations. Each December, at least one member of the professional body should be expelled for producing the worst design of the year. And what of the rebels, the eccentrics, the deviationists? By establishing an accepted tradition, you will do them the greatest possible service. You will have given them *something* against which to rebel.

Food Packaging enjoys a welcome uplift in two areas which, traditionally, have been conspicuous for dull and often vulgar design: candy and cigarettes. At least three new cigarette packages are exceptional for their individuality and good looks. One of them, Benson and Hedges, borrows an idea from facial tissue packaging in using a printed overwrap which the smoker detaches to eliminate any advertising intrusion (except the brand name). Barton's has abandoned the traditional hearts-and-flowers approach to candy packaging in favor of some contemporary graphic styling.

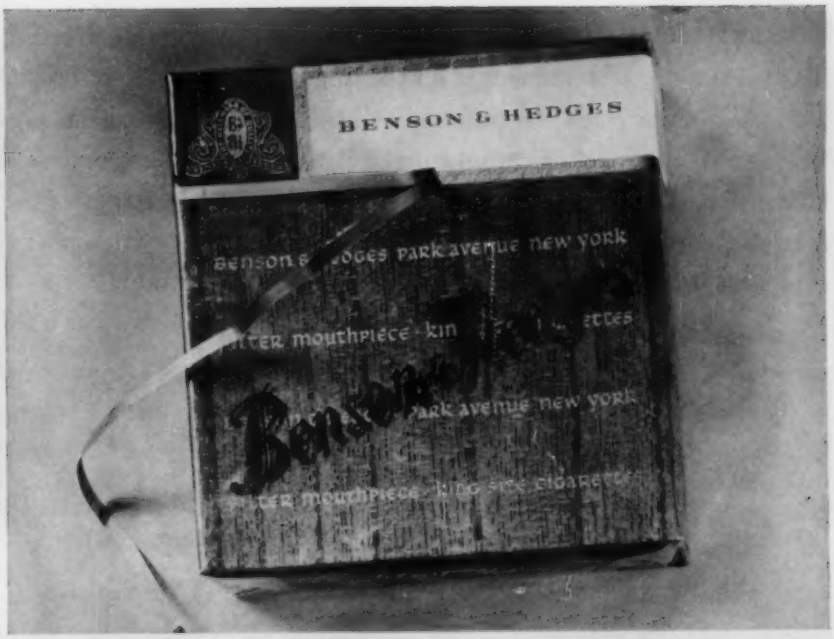
Manischewitz *wine carton uses rubber-plate printing in black, purple, and red on corrugated board. Carton design is related to company advertising, yet stands as an individual statement. Harry and Marion Zelenko Associates, designers.*

Spring Kist *frozen foods uses a tied-top polyethylene sack for its individually-quick-frozen berries and vegetables. Light-resistant bags come in intense colors which complement the product within and prevent color loss. Circuit and Eddington, designers.*

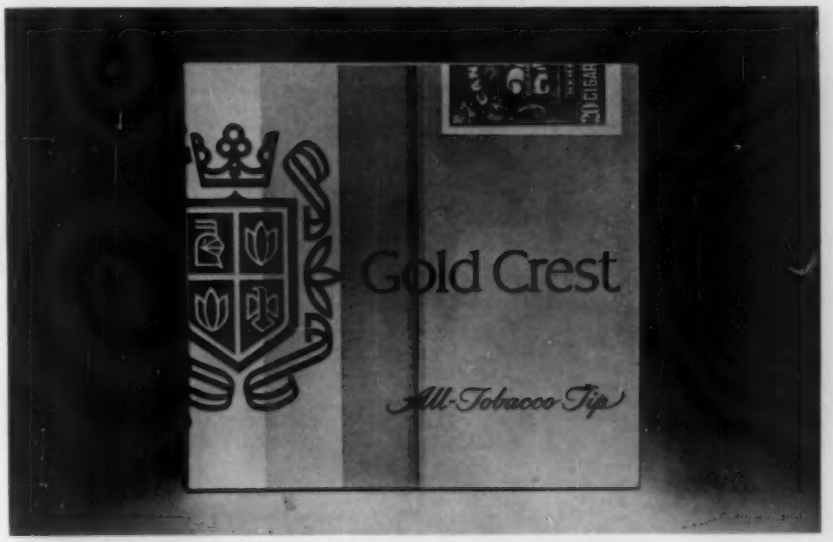


Lake Gold *frozen orange juice carton makes a bold impact with elementary triangle and circle forms in contrasting orange and green against a white background. Massimo Vignelli, Container Corporation of America, designer.*

U.S. Tobacco Company *King Sano cigarettes package stresses quality tobacco as well as filter purity. Tan "cork" band on white, blind-embossed oval encircles gold lion and King Sano name. Lippincott and Margulies, designers.*



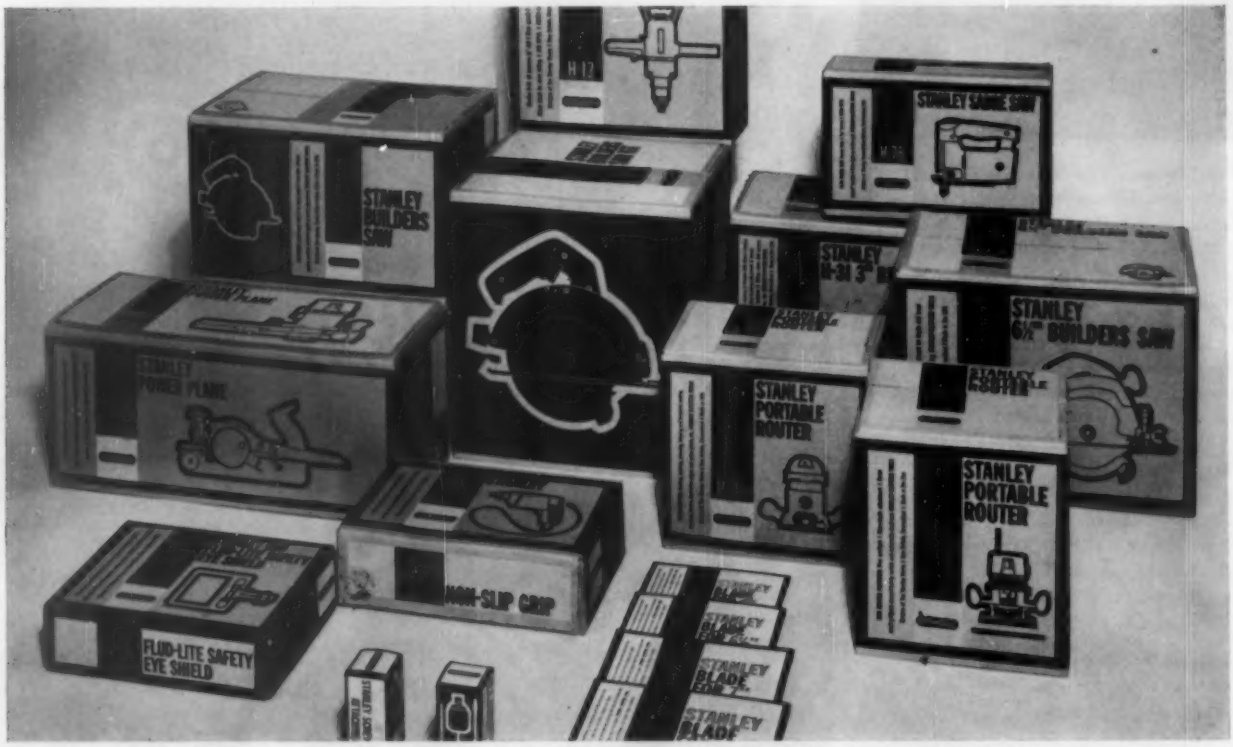
Benson and Hedges *"dual image" package is understated when in use by consumer, but meant to be a powerful seller on the tobacco counter. When the name-carrying transparent overwrap is removed, the consumer has a package on which the eighth-of-an-inch-high brand signature emerges quietly from an overall woodgrain pattern. Walter Landor and Associates, designers.*



Imperial Tobacco Company *of Canada Gold Crest Cigarettes features off-center gold crest, three tones of gold on white. Three shades are achieved by overlapping two colors in vertical stripes. Lippincott and Margulies, designers.*

Barton's Candy *has recently begun to appear in packages of contemporary design, a departure from the conventional folksiness of candy packaging. Although company research has indicated that a conservative approach is desirable for packaging special candy for their large Jewish market, Barton's can be much freer in novelty items (below and right). Jaap Penraat, designer.*

Household products packaging looks more sophisticated, presumably on the assumption that taste among consumers is on the upgrade, too. Such hardy items as the Stanley line workshop tools come dressed in well-tailored shipping cartons, and the pastel colors of the Burgess sponge package would make it as much at home on the vanity table as on the kitchen shelf. Even seldom-seen items like the TAP fish tank pump get handsome shipping cartons, while a design program which began with only this package mushrooms to include company stationery and advertising.



Stanley *series of shipping cartons for tools is part of redesign program for over 40 packages and cartons. Each carries bold outline of product for easy warehouse identification and to unify the line graphically. Lester Beall and Richard Rogers.*

Aluminium Limited of Canada *household foil emphasizes a new corporate symbol now used by all associated ALCAN companies, which combines a feeling of lightness with strength. Printed with glossy, transparent inks on laminated aluminum foil, the package is silver, turquoise, and white. Raymond Loewy Associates, designers.*

Baldwin *packaging for paint thinner and solvent line limits number of type styles to two faces and features a simplified letter "B" on all letter-heads as well as on packages. Each of the company's nine products now uses a different color against white. Don Blauweiss, designer.*

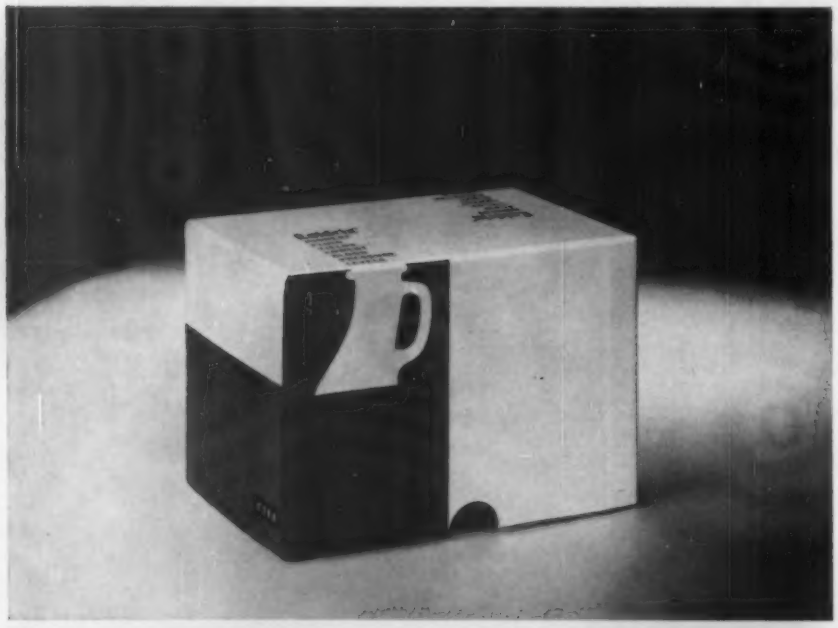
Sylvania *light bulb cartons utilize a comprehensive system of color-coding for wattage size. Sturdy paperboard two-bulb package has a center separator and die-cut opening at each end through which the bulb can be seen. Lippincott and Margulies, designers.*

Doubl-Glo *packaging for Christmas materials utilizes such diverse packaging techniques as die-cut paper, vacuum-formed bubbles, cellophane bags, cans, cellophane overwraps on trays, and folding boxes. Red and green symbol is used throughout packaging, promotion material, and stationery. Harry and Marion Zelenko, designers.*

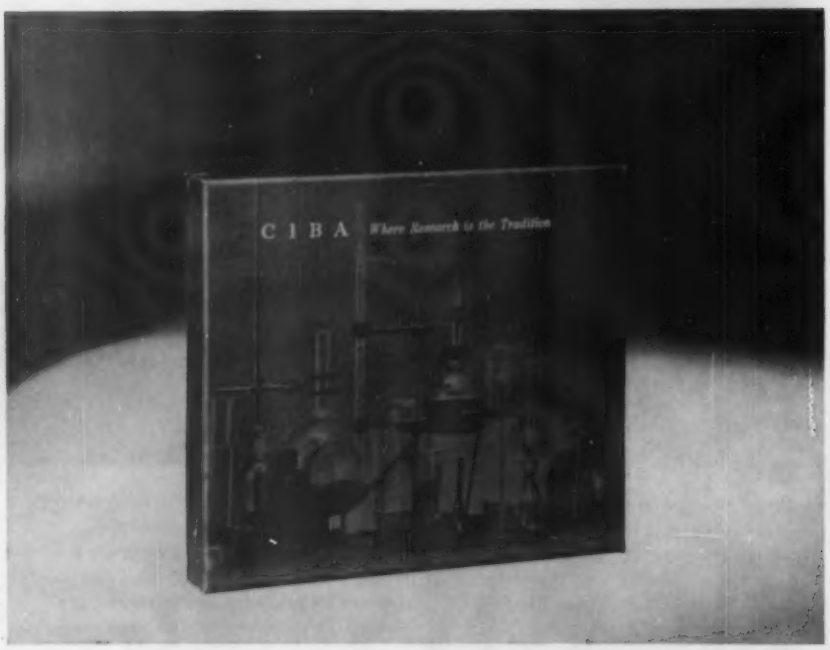
Burgess *sponge package features a large "B" against checkerboard pattern, printed in two colors of transparent ink plus opaque white. Sponges themselves extend the color-range. Dave Chapman, Inc., designers.*

Tropical Air Pump *shipping carton for fish tank pumps uses a stylized fish motif to establish a strong image in a highly competitive field. Symbol also appears on product name plate and stationery. Eckstein-Stone, Inc., designers.*

Drug and cosmetic packaging still offers one of the most interesting areas for imaginative and experimental graphic design. Because of a highly competitive selling situation, drug companies use a whole bagful of graphic tricks on their sample mailers to catch the eye of the busy doctor. Yet the discretion required in selling drugs and the caliber of the medical audience demand packaging of careful taste. Cosmetics packaging, on the other hand, must appeal to a broad feminine audience and offers a constantly changing series of fresh packaging. Tussy, for instance, has just adopted unusual brush drawings and freehand lettering to give its line a completely new look on the cosmetics counter.

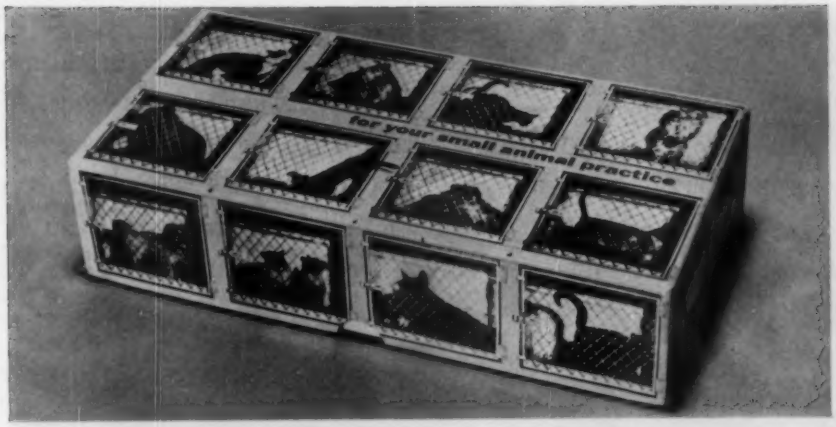


CIBA *Esidrix sample mailer uses urine bottle to symbolize the nature of this new diuretic. Miniature urine flask inside box contains sample tablets. Jack Marmaras, CIBA art director. Ernest Smith, Al Amate, designers for Sudler and Hennessey.*



CIBA *standard mailers (below left) for* 1960 *use a photographic treatment of lab equipment, and each is printed in two different metallic inks such as cool gold on warm gold, gold on silver, or green on metallic blue. Absence of text makes the design flexible enough for use on many sample items. Jack Marmaras, CIBA art director. Harry and Marion Zelenko Associates, designers.*

Mennen's *pre-electric shave lotion, Prop, features a package design related in appearance and shape to the shaver it is meant to accompany. Francis Blod Design Associates (bottle by George Stehl, graphics by Fred Feucht).*



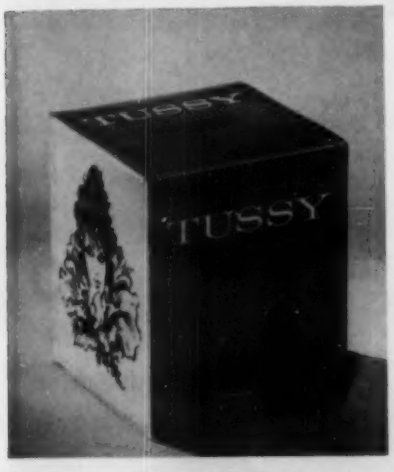
Eaton Laboratories *veterinary sample box uses highly realistic black and white photographic technique in its cover design. Ora-bols, the new medication which the sample promotes, is intended for use with small animals. Abe Seltzer, designer.*

Merck Sharp and Dohme *Hydeltrasol drug mailer shows eight different symbols for skin diseases, each enclosed by a circle and a square, to help identify the contents to the doctor. Andrew B. Schmith, designer.*

Personal Product's *Meds package develops a modern look for a "modern" product. Offset printing on foil paper board. Four-color effect created by overprinting on white areas with transparent inks. Charles Magers, designer*

Q-Tips *cotton ball package features a hamper lid which makes one-hand opening easy. Design retains company logo and two-tone blue color scheme, and features white cotton balls on three sides for effectiveness in mass displays. Robert Zeidman Associates, designers.*

Stephan Company *presents a completely unified packaging program to match its full new line of men's grooming products. The line is available only through barbershops, and the new packages aim at the most captive of all audiences: the man in the barber's chair. Jim Nash Associates, designers.*

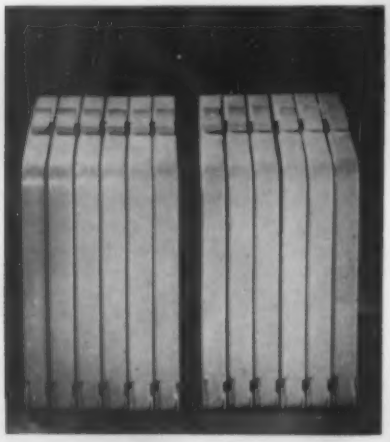


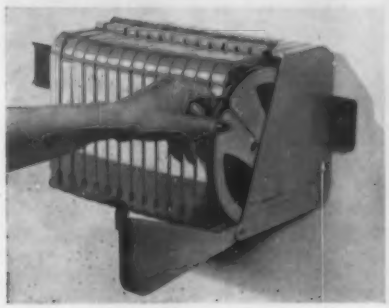
Tussy *gives a completely fresh look to cosmetic packaging through use of highly individualized brush drawings and sophisticated color blends. Freehand lettering (back panel) contrasts sharply with conventionally severe pharmaceutical lettering of front panel. Leonard Rubin and Robert Cottingham, designers.*

Miscellaneous selection of packages for items ranging from office supplies to cameras, shows how the package alone can express a particular company personality, and, like the new Fairchild Cinephonic package, can also be an excellent foundation for a complete merchandising scheme. With cost in mind, designers initiated for Ditto duplicating products a printing method which will bring the client substantial savings. By contrast, Ferrodynamics has tripled the cost of its audio tape package in the belief that the tape recorder fan will find the longer-lasting plastic case, designed to make the product more convenient to use, worth the extra price.

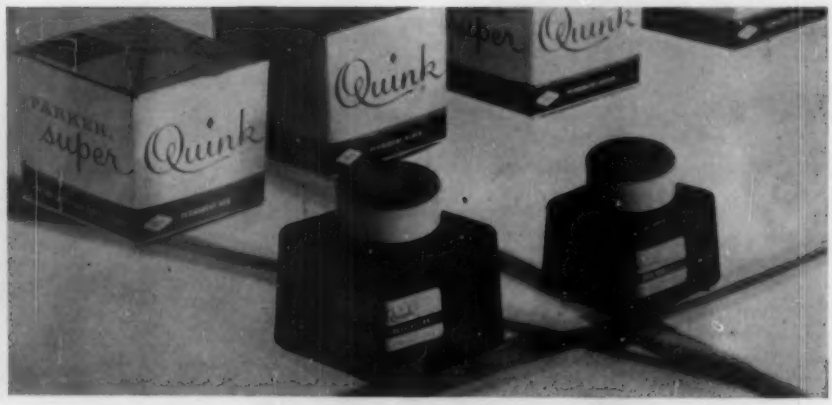
Ditto *package program for its duplicating products will extend to include company stationery and delivery trucks. Printing can be done in a single color stock paper available in the four basic company colors, saving 10 to 15 per cent in printing costs. Morton Goldsholl Design Associates.*

Ferrodynamics *Sonoramic audio tape container eliminates cardboard as a material in favor of high-impact polystyrene. Dimples in sides allow for interlocking, and a molded dovetail allows for the preferred vertical storage on a metal strip. Specially etched surface on reel itself will take writing. The package costs about three times more than a cardboard container, but will last longer. I. Kantor and O. Louis Seda, designers.*



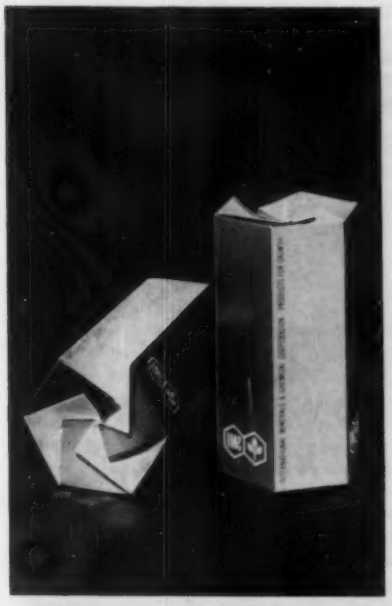


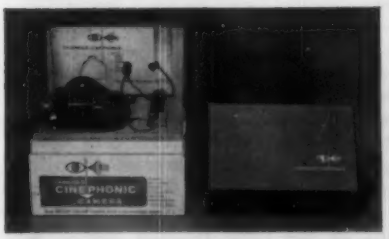
Parker *Quink diamond-shaped ink bottle and folding carton present a new shape for the packaging of this product. Color band and diamond appear on both sides of box and top. Each package is color-keyed to the shade of ink inside. Dave Chapman, Inc., designers.*



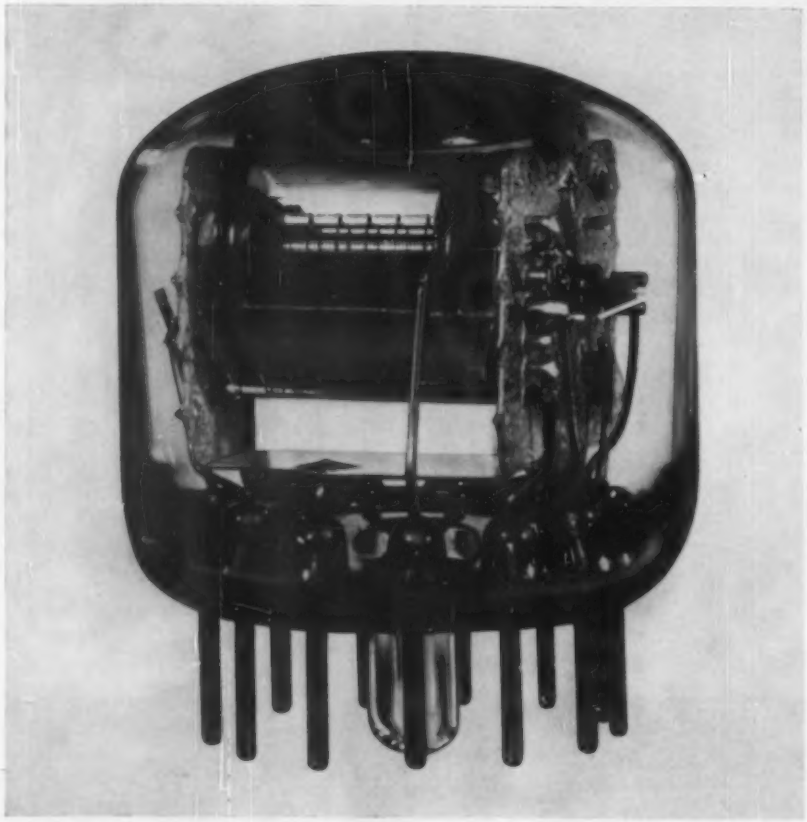
Radiant White Chalk *offers its low-cost product in a high style red and white package. It is related in design to firm's color chalk packages so that line presents a bright, overall aspect, yet retains good product identity. Ben Rosen and Irv Koons, designers.*

International *Minerals and Chemical Corporation's A'ccent sample box takes hexagonal form from hexagonal trademark, symbolizing a crystal structure. Colors are the three basic ones used in all company promotion. Morton Goldsholl Design Associates, designers.*





Fairchild *Cinephonic Eight camera, the company's first consumer product, is packaged in a bright burnt orange container with a new trademark hotleaf-stamped in gold and white. The trademark's stylized human eye and loudspeaker symbolize the visual and aural reproduction capacity of the camera, and design reappears on shipping carton. Kivar, a leather-grained paper, covers the surface of the box, and gray velour covers the inner die-cut platform. Ehrman and Reiner, designers.*



Improved electronic tube device

The problem of fitting more into less space is often solved by reducing the size of component parts; however, in a new electronic vacuum tube development, the problem was solved by combining several functions, each of which conventionally requires a separate tube, within a single tube, thus eliminating the need for some parts. At the same time, the development, known as the "Compactron," is shorter (the height of a tube from base to top is an important factor when designing a receiver) than the equivalent vacuum tubes. It is also said to provide better performance than the transistor, widely heralded several years back as the eventual replacement for all vacuum tubes, and is less expensive than either.

The Compactron is a device which combines within itself the working functions of two or three conventional vacuum tubes or two or three transistors. It will be suitable for use in radio and television receivers, industrial controls and instrumentation, or wherever the other devices are now used. The extent of the size reductions possible in various products is indicated by the following examples: two Compactrons equal five tubes or seven transistors in a home radio; seven Compactrons do the same job as 10 tubes or 22 transistors in a hi-fi set; 10 Compactrons and one diode equal 15 tubes and three diodes, or 24 transistors and 11 diodes in black and white television; and in color television, the difference is even greater —15 Compactrons as against 22 tubes and two rectifiers, or 36 transistors, five tubes, one diode, and one rectifier.

The advantages of this substantial component reduction include more compact equipment performing at the same or better efficiency, lower prices resulting from the multi-function capabilities which reduce manufacturing and assembly costs, and less frequent failures and low repair costs because fewer components are involved.

The Compactron tube incorporates a number of new design features, several of which depart completely from the present day concepts of tube making. The tube uses a 12-pin circle at its bottom instead of the usual seven or nine; the additional pins are needed to serve the internal multi-functional structures in the tube proper. The 12-pin design adapts well to printed circuitry because it provides adequate space to make connections to all of the pins. In addition, it offers a very fine foundation for the support of the internal tube structures, and it permits spot-welding points to be reached more easily, thus assuring more reliable connections and facilitating automatic assembly.

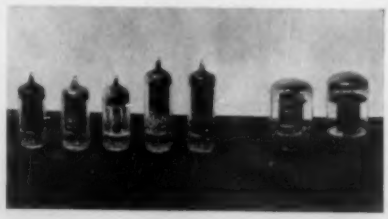
The traditional exhaust tip at the top of the tube has been placed between the pins on the bottom where it does not waste space.

The Compactron has been given a 1⅛ inch diameter (slightly wider than vacuum tubes) in order to permit it to be mounted horizontally, thus offering a wide flexibility of design possibilities.

Additional bulbs and stems have been eliminated by combining two or more functions within the same tube envelope. A single integral heater has been accommodated to supply power to the various cathodes, and special metals have been used in the heater to reduce its power requirements by a third in some types.

When the quality of a Compactron radio's performance is compared with that of a transistor set, the former is able to deliver twice as much maximum power output. At the same power output, the tone is better. In addition, the Compactron has about a fifty per cent greater ability to pick up radio signals from distant stations than the transistor.

In the next year, approximately nine types of Compactrons will be introduced; eventually, there will be 75 to 100 types. In the picture below, the two Compactrons on the right perform the same functions as the five tubes on the left that they replace. *Manufacturer: General Electric Company, Schenectady 5, New York.*



New investment casting process

A new casting process has been developed which can produce intricately shaped investment castings weighing up to 100 pounds. Previously, castings made by this process were limited to a size easily held in the palm of the hand.

Instead of forming a solid mold by surrounding a wax pattern with a ceramic, the new technique builds up a shell-like mold by repeatedly dipping a wax pattern in a ceramic to obtain thin uniform coatings. The number of coatings required is dependant on the thickness necessary to withstand the pressure of the molten metal during casting. In general, six layers are used to build up a shell of approximately one quarter inch which is then dewaxed, fired, and cast like a conventional solid investment casting.

Besides greatly increasing the casting size, this new ceramic shell process offers other advantages: it is possible to produce parts with more intricate coring; castings produced by this method have a finer grain structure; there is greater freedom in designing the gating arrangement; and it produces a more consistent surface finish which requires much less machine finishing than the ordinary solid mold castings.

The picture above—a pump housing for a rocket engine—illustrates the intricate shapes obtainable with the new method. *Manufacturer: Arwood Corporation, New York, New York.*

Drafting table

A new drafting table that functions as such, but looks like a standard desk, has been designed for engineers, draftsmen and artists to use either in their homes or offices. The drawing board is concealed beneath the desk top in a well that provides sufficient clearance for permanent mounting of drafting machinery. The clearance also permits tools or reference books to be left on the drawing board when it is lowered. The portion of the desk top alongside the drawing board slides out to permit access to a tool and

supply compartment. In addition, the desk provides adequate storage facilities for drawings, reference books, files, etc. The Drawing Chief is available in different styles and sizes. *Manufacturer: Densmore Calculator Co., Oakland, Cal.*

Industrial cord strapping

A rayon cord for industrial package strapping operations has recently been introduced that offers certain advantages over the standard steel strap. Known as Avistrap, it weighs ¼ to 1/7 as much as steel strapping of comparable strength and is also less expensive. The highly flexible strap does not have any sharp edges, and it is said to tighten around carton corners without cutting them. If overtensioned, it will not lash out with jagged ends. Further, it can be burned for easy disposal, and it can be clearly imprinted with company or product name for promotional or identification purposes. The strapping is available in thousand yard coil lengths on disposable spools 13½ inches in diameter and 6 inches wide. *Manufacturer: American Viscose Corporation, Philadelphia, Pa.*

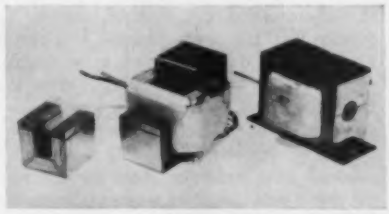
Redesigned transformer

One of the most stable and unchanging pieces of electrical equipment—the transformer—has recently been redesigned so that now it is not only lighter and smaller, but even more important, it can be designed in any shape or size (up to 18 by 18 by 36 inches) without any additional cost. The advantage of this is that engineers will be able to specify a "tailored" transformer that will fit into equipment and systems that have already been designed; heretofore, these systems have had to be built to accommodate transformers of standard shapes and sizes.

The heart of the new transformer, known as Flexi-core, is a formed core that consists of nests of laminations, or layers, of steel strips fabricated from a continuous roll. Each of these cores is divided into two U-shaped nests of strips which are fitted together by interleaving at the top of the U's. The resulting unit is a hollow rectangle, square, or other shape.

The conventional "EI" transformer consists of laminations of metal stamped in the shape of the letter "E" which is completed by closing in the open side of the "E" with a metal strip stamped in the form of the letter "I."

The Flexi-core transformer is said to operate more efficiently than the conven-

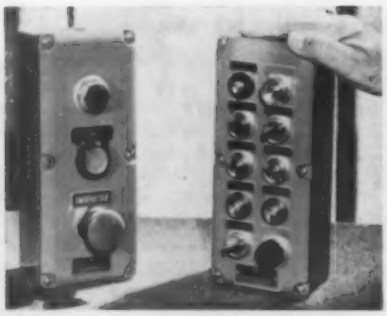


tional transformer because the magnetic lines of force flow continually with the grain of the steel in the nested cores rather than across the grain, as occurs in the "EI" laminations. This reduces the resistance of the circuit.

In addition, because the new transformer can be designed in any size and shape, computers can be used to determine the optimum dimensions. This is not true with the "EI" laminations, which are limited in size and shape. *Manufacturer: Sylvania Electric Products, Inc., New York, New York.*

Smaller push buttons

A complete new line of miniature industrial oil-tight push button units has been introduced which permit up to a forty per cent reduction in panel space requirements. The new units, which are about half the size of existing heavy-duty units, may be mounted as close as one and one-quarter inches apart. The line includes push buttons (with or without guard),

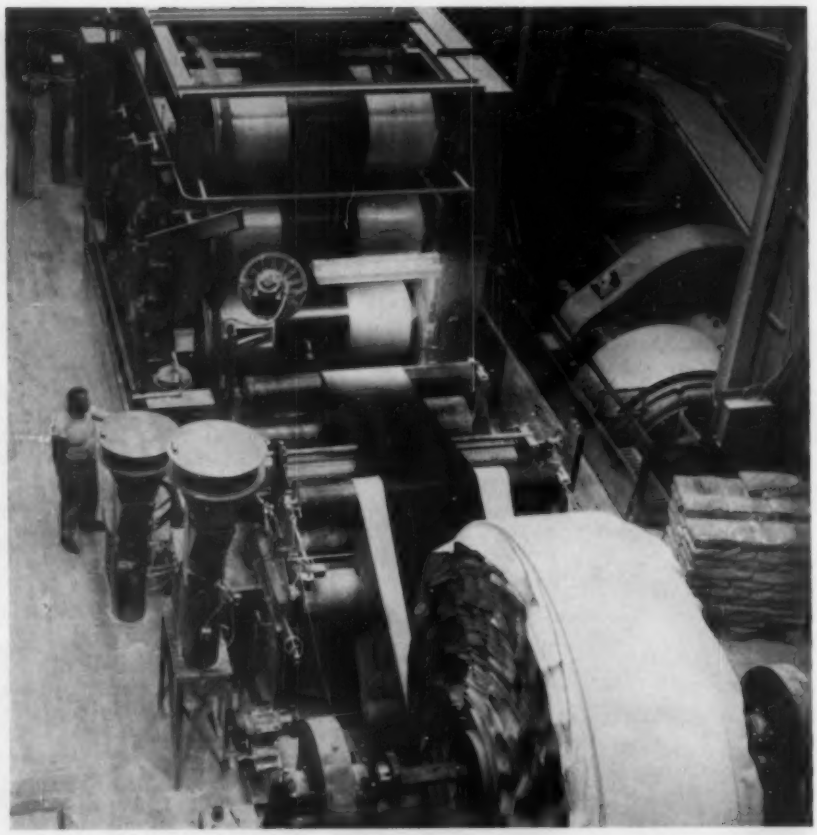


mushroom head buttons, selector switches, illuminated push buttons, transformer-type indicating lights, and push-to-test indicating lights.

In the picture above, the new push button line is shown at the right in the same size enclosure as conventional units on the left. The line includes six different colored retaining rings to permit easy changes in color coding. *Manufacturer: General Electric Company, Schnectady 5, New York.*

Drafting materials developed

The development of a waterproof drafting film (Herculene) and a special pencil (Duralar) that deposits a plastic rather than a graphite line now makes it possible to restore soiled, unprintable tracings by simply washing them in soap and water (below). Not only can the film be washed (the Duralar line forms a bond with the Herculene surface that cannot be washed off), but when it is creased and wrinkled, it can be smoothed out and it will still produce usable prints. Another example of the film's toughness was shown by one test in which scalding coffee was spilled on it and allowed to stand for two hours. When the drawing was washed with soap and water, it was still reproducible, and the pencil lines were intact and legible. *Source: the film was developed by Keuffler & Esser Company, Hoboken, New Jersey; the pencil by J. S. Staedler Company, Hackensack, N. J.*



Automated belt calendering

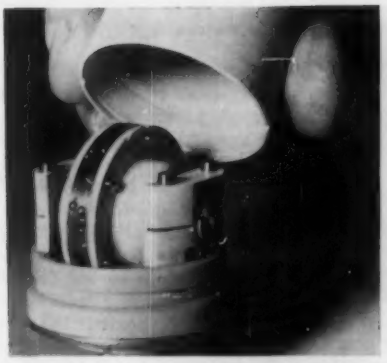
The process of conveyor belt calendering has recently been automated through the development of a two-story-high, electronically controlled unit (above) that is capable of spinning out a two to three mile ribbon of belting daily. Two X-ray devices are used to control the uniformity of the belt as it passes through the calender. The first senses the thickness of incoming material and reports this to an electronic panel that controls the calender rollers; the second measures and reports the finished thickness. The belt then moves through a giant 12-roll cooling line and is wound into a coil, ready for curing. *Source: Goodyear Tire & Rubber Company, Akron, Ohio.*

Better gyroscope

A miniature ceramic gyroscope has been developed for space guidance work that is said to represent a ten-fold improvement in gyro accuracy. The new gyroscope was made possible by the development of a ceramic material, as hard as sapphire, that can be diamond-honed into the tiny and ultra-precise shapes of critical gyro parts, and the development of a miniature ceramic gas-lubricated bearing.

The ceramic bearings of the new gyro are lubricated (separated) by a film of helium gas only 25 millionths of an inch thick. The film of gas, which is virtually friction free, reduces the vibration, or bearing noise, of the conventional steel ball bearings which it replaces by a ratio of 30 to 1. In addition, wear is negligible because there is no contact between the bearing elements. The principle of the gas bearing is not new; however, previous models without ceramics have been severely limited in usefulness because of their large size and excessive bearing wear caused by starting and stopping.

The new gyro is only 2.8 inches long and 2.0 inches in diameter and weighs approximately half a pound. Its superhard ceramic bearings have undergone thousands of starts and stops without detectable wear. The ceramic material is used not only because of its hardness, but also because of its dimensional stability over a wide temperature range: it has been subjected to temperatures ranging from minus 85 degrees F. to 1500 degrees F. and it retained its original dimensions within two millionths of an inch. The extremely small clearance tolerances in the gas bearing spin motor (they are machined to within five millionths of an inch) mean that even the

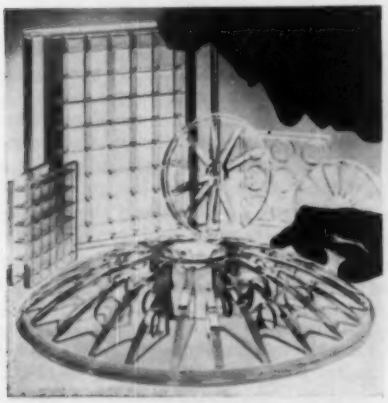


presence of dust cannot be tolerated, and, therefore, the ceramic parts are cleaned in acid which dissolves everything but themselves. The extreme tolerances required may be better understood from the following analogy: five millionths of an inch is to one inch what the thickness of a postcard is to the height of the Empire State Building.

In the illustration above, the tiny holes in the balance ring of the gyro motor have been drilled to equalize the weight load so that when the motor is spinning, perfect balance is achieved. *Manufacturer: Minneapolis-Honeywell Regulator Company, Minneapolis, Minn.*

Lightweight telescope mirrors

The application of a sandwich construction technique to the building of mirrors for use in missile, satellite, and airborne compact telescopes has reduced their weight by as much as fifty per cent. The mirror blanks consist of two fused silica plates separated by ribs or tubes of the same material which are permanently sealed to the plates. The weight savings



gained by the use of this method is further augmented by the consequent reduction in size and weight of the mounting and auxiliary equipment. Fused silica is used because it has a near zero thermal expansion which means that the mirrors will retain their shape even under sudden and extreme temperature changes; this helps assure distortion-free images. The mirror blanks are being produced in a wide range of sizes, shapes, and rib constructions. *Manufacturer: Corning Glass Works, Corning, New York.*

Space age metals

The production of certain metals for critical outer space applications requires an "out-of-this-world" production facility here on earth. This fact was demonstrated recently when it was announced that extremely high purity mill products of the refractory metals—molybdenum, columbium, tantalum, tungsten, and their alloys—were being produced in a specially conceived enclosure filled with argon gas. Such an environment is necessary because, to be processed properly, these metals must be worked at temperatures double those possible in conventional

mills (4000 to 4500 degrees F.) and out of contact with a normal atmosphere. Otherwise, at these extremely high temperatures, they would oxidize and become contaminated with elements in the air.

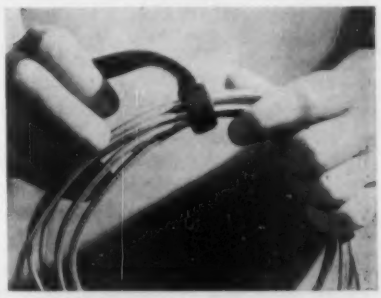
The refractory metals are currently being produced on specialty steel mill equipment; however, this equipment does not permit them to be worked at their true hot working temperature because of atmospheric contamination. Therefore, the refining operations must be repeated again and again in an effort to minimize oxidation and other undesirable atmospheric effects. The new facility, known as InFab (Inert-Fabrication), will produce a vastly superior refractory metal and will eliminate a number of the many conditioning and annealing operations currently necessary. And the metals will be produced at approximately the same cost level as those now produced.

The InFab facility is a welded steel enclosure 42 feet wide, 97 feet long, and 23 feet high. Inside the enclosure are an impactor for forging ingots into billets and sheet bar, a rolling mill for producing sheets, plates, and bars from the billets and sheet bars; furnaces; a ten-ton crane; and additional equipment. All the equipment is fully automatic and is controlled from consoles located outside the facility. Some manual handling is required in taking materials into the facility and transferring them between equipment. Personnel are required to be inside the room only to conduct experiments. They wear a specially designed suit similar to a space suit, and carry their own air supply and cooling unit on their backs. Men, material, and equipment move in and out of InFab through three air locks which serve to maintain the extreme argon purity of the enclosure. *Sources: Universal-Cyclops Steel Corporation, Bridgeville, Pa.*

Tape fastener refined

A variation of the Velcro® nylon tape fastener (see ID, April 1959, page 44) has recently been introduced. It consists of a single strip of nylon tape faced on one side with tiny hooks and, on the other, with soft loops. Until now, the fastener has only been available as two separate strips of tape. The new "Back-to-Back" Velcro (below) opens and closes in the same manner, except that now the single strip can be fastened together upon itself.

The new tape grew out of the electronic industry's need for an efficient temporary harnessing device for wires that have to be held together in groups. The tape will also be suited for temporary bundling of materials shipped within plants, and as a means of applying insulating covering over pipes and



tubes. It is available in ½ or 1 inch widths, and has a shear strength of 6 to 8 pounds per square inch. *Manufacturer: Velcro Corporation, New York, N. Y.*

Improved solid lubricants

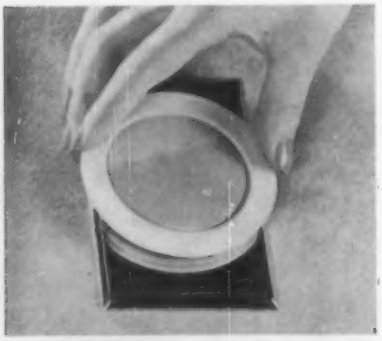
A solid lubricant has been developed which has as much as twenty times the normal load-bearing capacity of conventional solid lubricants. This type of lubricant is very useful because it can be used at higher temperatures than liquid types and because it functions perma-

nently, thus improving reliability and reducing maintenance. The new lubricant was developed by adding small amounts of various inorganic sulfides to molybdenum disulfide. When the new material is used on iron or steel surfaces, the additives decompose, producing a layer of iron sulfide on the metal surface. *Source: General Electric Research Laboratory, Schenectady 5, New York.*

Electroluminescent night light

A night light that makes use of electroluminescence—the direct conversion of electrical energy into light—is now available to the consumer. The light (below) which sells for 98 cents, plugs into a standard 120-volt outlet, and is said to have a life expectancy of almost five years of continuous burning. It uses less than three cents worth of electricity per year. The night light provides a soft green light source 3½ inches in diameter which illuminates a small area without creating a distracting light at a distance.

A rigid vinyl sheeting is used to protect the light source, a ceramic plate coated with electroluminescent phosphors. Besides the night light application, the same company makes electroluminescent panels as large as 24 by 36 inches. *Manufacturer: Sylvania Lighting Products, Inc., New York, New York.*



Sound-absorbent wall covering

A new laminating process makes it possible to adapt various fabrics—such as cotton, rayon, silk, synthetics and burlaps—for wall coverings by backing them with vinyl foam up to ¼ inch thick. The resultant material combines the decorative qualities of the surface fabric with the sound-absorbing properties of the backing. It may be applied to the wall with any standard cellulose paste, or it can be tacked or stapled. According to the manufacturer, the outer face will not retain nail or tack marks because the vinyl foam backing contracts and seals the puncture when the nail is removed. *Manufacturer: B. F. Ruskin & Company, New York 62, New York.*

Photoelectric cells in any shape

Photoelectric cells, which activate mechanisms by converting light energy into electrical energy, are now available in almost any size or shape. The new "Type 5" cells are also said to be 50 per cent more sensitive than previous cells. They can be manufactured in spherical or cylindrical shapes, or as flexible strips that can be twisted into a variety of spiral designs (above). A convex shape can be made for exposure to light from all directions, thus eliminating the necessity of optically adapting the conventional flat photocell for multi-directional duty. Similarly, a concave shape can be used for pinpoint readings. Curved or spiral photocells could be set upon a rotating base for use in on-off power functions or as a speed-measuring device. *Manufacturer: Weston Instruments Division, Daystrom, Inc., Newark, N. J.*

Aluminum finishing process

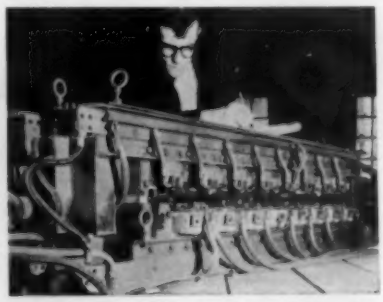
The development of a special aluminum alloy and appropriate vacuum die casting techniques now make it possible to obtain aluminum die castings that can be color anodized; in addition, the same casting can be brazed, welded, or coated with porcelain enamel. The alloy, known as Hamiloy, can be anodized in such colors as black, gold, green, blue, pink, etc. The colors are said to be crisp and clean and uniform in appearance. Three basic finishes are presently available: satin, semi-gloss, and polished bright. Hamiloy, unlike high purity aluminum alloys which have low tensile and yield strengths, is said to have good machining characteristics, a tensile strength of 37,000 psi, and a yield strength of 24,000 psi. Also it has a higher melting point than conventional aluminum castings. At present, the applications of the new alloy include aircraft seating parts, and architectural fittings. In addition, it is being considered for use on a camera. *Manufacturer: Hamilton Die Cast, Inc., Hamilton, Ohio.*

Continuous annealing

A continuous annealing process for heating strip and sheet products of steel, brass, copper, aluminum, and other metals has been announced. Known as flash annealing, it is designed to give fabricators a metal that can be pressed and shaped with a minimum of cracking.

The process consists of continuously unwinding a coil of metal in an electric heating device, heating it to the desired temperature, and cooling and recoiling it as it passes out of the heater. The picture below shows a 48-inch strip heating unit; the metal passes through a slot in the center.

In conventional methods, metals are stacked in fuel-heated furnaces in tightly wrapped coils and heat must work toward the center through successive layers of metal. As a result, the outside layers



are heated longer than the inside, and it is difficult to obtain a uniform grain size throughout the coil. In flash annealing, the grain sizes are uniform, and are also 1/3 to 1/5 smaller than those produced in conventional annealing; this means that the metal will be stronger and less likely to crack or break under strain.

Metallurgists have known for years that flash annealing will produce a fine grain. However, they did not know a way to apply uniform heat to the metal. The problem was solved by the Penn Induction Corporation by placing the electric coils in such a way that even heat is produced along the entire width of the metal strip as it passes through the annealing chamber. The method was a simple one; they placed each coil so that electric flux lines would overlap those from the coil next to it.

At present, the largest flash annealing chamber will handle metal strip up to 48 inches wide; plans are being studied to build one that will handle an 80-inch strip. Allegheny Ludlum supplied the steel mounts for the copper coils that induce heat into the metal being annealed. Material thicknesses from .00035 to ½ inch have been successfully heated. *Source: Allegheny Ludlum Steel Corporation, Pittsburgh, Pennsylvania.*

Manufacturers' Literature Supplement

A bibliography of currently available technical brochures dealing with materials, methods, components, and machines

Materials — Metals

1. **Fittings for Lightweight Steel Pipe.** Tube Turns Division, Chemetron Corporation, Ill. Bulletin describes lightweight carbon steel pipe fittings and flanges, and illustrates advantages of welded construction for non-critical, small-diameter pipe systems.

2. **Shaped Wire.** Page Steel & Wire Division, American Chain & Cable Company, Inc. 16 pp. Ill. Catalog describes facilities for making pre-shaped wire of various analyses. It also includes methods of calculating areas of common shapes, physical properties of steel wire, table of standard wire gages, and hardness conversion tables.

3. **Vinyl Coated Steel.** United States Steel Corporation. 20 pp. Ill. Brochure describes fabrication techniques and design possibilities for vinyl coated steel sheet. It is available in a variety of patterns, textures, and colors.

4. **Pure Beryllium Tubing.** Superior Tube Company. 4 pp. Ill. Data sheets give full information on the available sizes and properties of pure beryllium tubing. Beryllium has various nuclear applications because of its low neutron absorption characteristics, low density, high rigidity, and good oxidation resistance at high temperatures. In addition, the material is light weight (about half that of aluminum), and very strong (stronger than low carbon steel).

5. **High Tensile Strength Steel Bar Applications.** La Salle Steel Company. 9 pp. Ill. Case studies describe Fatigue-Proof steel bars which replaced other materials in a variety of applications including pinion gears, piston rods, spindles, and lathe transmission gears. Fatigue-Proof steel is produced by a patented elevated temperature drawing process; it is said to have a tensile strength over 140,000 psi, and excellent machinability and uniformity.

6. **Electric Elevator Furnaces.** General Electric Company. 4 pp. Ill. Bulletin describes electric furnaces for stress relieving and annealing of large parts, or heavy loads, with uniform temperature distribution. Cutaway drawings illustrate construction features of furnaces.

Materials — Plastics

7. **Resins for Rubber Compounding.** Schenectady Varnish Company. 16 pp. Ill. Booklet presents latest data on the properties and functions of resins used in compounding and formulating rubber and rubber-based adhesives. The resins include the major types of phenolics, terpenephenol, and pure hydrocarbon polyterpenes; they are used with butyl, neoprene, nitrile, reclaimed and natural rubbers.

8. **Acrylics and Thermo-plastics Manufacture.** Ray Products Inc. 4 pp. Folder describes capabilities, facilities, and production methods used by the company in plastics fabrication.

9. **Acrylic Rods and Tubes.** Cadillac Plastic & Chemical Company. 8 pp. Ill. Brochure describes applications and properties of acrylic rods and tubes. Also included is information on other plastics: polyethylene, polystyrene, nylon, teflon, and acetate.

10. **Vinyl on Metal.** Plastics Division, Monsanto Chemical Company. 20 pp. Ill. Brochure describes how vinyl dispersions, film, or sheeting can be used to improve product performance and add new dimensions in form, color, and texture. The spray, dip, knife, and reverse roll-coating application techniques are covered, and the advantages of each are described. The methods of laminating vinyl film or sheeting to metal are also discussed.

11. **New High-Density Polyethylene.** Union Carbide Plastics Company. 8 pp. Technical bulletin describes a new high-density polyethylene pipe compound that is said to exhibit high burst-strength and to be easily processed at high production rates in conventional extrusion equipment. The material has National Sanitation Foundation approval and meets the requirements of the Commercial Standard.

12. **High-Density Polyethylene Products.** W. R. Grace & Company. 20 pp. Ill. Booklet presents pictures of 101 commercially successful applications of polyethylene, and offers a brief description of the product and the method of fabrication. In addition, there is a section on design considerations such as section thicknesses, fillet radii, ribs, bosses, parting lines, undercuts, inserts, etc.

13. **Coatings Selector.** Bee Chemical Company. Charts serve as a guide to the selection of specialty coatings for application on plastics, metals, glass, and wood. Includes information on uses and characteristics of spray, dip, flow coating materials, vacuum metallizing coatings, and standard plastisol formulations.

14. **Plastics Fabrication.** General Plastics Corporation. 8 pp. Ill. Brochure describes facilities for fabrication of such plastics as butyrate, acrylic, styrene, and polyethylene.

Methods

15. **Automatic Screw Inserter.** Standard Pressed Steel Company. 4 pp. Ill. Folder describes the relative economics of set screw installation by hand, power tool, and automatic inserter. Information is given on an automatic set screw inserter that is capable of 2500 insertions an hour, and which can be used as an attachment to a single machine, or as part of a fully automated production line.

16. **Interior and Exterior Weatherstripping.** Pemko Manufacturing Company. 14 pp. Ill. Booklet describes the various types of weather-stripping materials, and the proper ways of weatherstripping against drafts, noise, dust, leaks, and light. The emphasis is placed on the weatherstripping of commercial and industrial buildings.

17. **Machining Glass Base Laminates.** National Vulcanized Fibre Company. 3 pp. Ill. Technical article describes specific techniques for fabricating glass-base laminates. Techniques covered include sawing, boring, shearing, slitting, punching, drilling, turning, and milling.

18. **Vacuum Impregnation.** F. J. Stokes Corporation. 16 pp. Ill. Brochure describes the advantages and principal current applications for vacuum impregnation. This production method is used in such diverse applications as rendering pressure-proof castings of brass and bronze, aluminum, and magnesium, and in the manufacturing of machine-made lace.

19. **Packing Selection.** Raybestos-Manhattan, Inc. Chart suggests seven basic packing materials for most applications including pumps and valves, air compressor gaskets, and hydraulic and pneumatic equipment.

Components and Machines

20. **Rod End-Finishing Machine.** Pines Engineering Company. 4 pp. Ill. Bulletin describes bench-type Model 660, a machine for the end-finishing of rods. Features of the machine include one-piece head frame, simplified tooling set-up with interchangeable chuck inserts and tool holders, 8-speed drive motor, and front-mounted precision depth stop.

21. **Ultrasonic Flaw Detector.** Branson Instruments, Inc. 8 pp. Ill. Booklet describes the Sonoray Model 5 flaw detector which, by sending short pulses of acoustic energy at ultrasonic frequencies into the object under test, can detect flaws in a variety of materials including metals, glass, and plastics. The detector works from one side only, and there is no physical damage.

22. **Centrifugal Air Compressor.** Clark Bros. Company. 20 pp. Ill. Bulletin describes the Isotemp 110 psi centrifugal air compressor, which can furnish high purity air for air separation plants, wind tunnels, soot blowing, and other industrial uses. A key feature of the compressor is a specially designed system of integral inter-coolers built into the base.

23. **Clamps.** Ideal Corporation. 4 pp. Ill. Catalog offers construction and application information on clamps for hose, plastic pipe, and other industrial applications.

24. **Environmental Testing Equipment and Data.** Webber Manufacturing Company. 32 pp. Ill. Brochure presents information on environmental testing and applications for controlled atmospheric conditions. It includes a review of 13 types of environmental chambers and low-temperature freezers that simulate various conditions of altitude and humidity. Included is a pictorial chart summarizing the latest known data on weight, pressure, molecular weight, acceleration of gravity, and temperature, etc. at altitudes from sea level up to two million feet.

25. **Bending Machines.** Wallace Supplies Mfg. Company. 16 pp. Ill. Catalog describes complete line of rotary benders for the forming of tube, pipe, bars, structural shapes, channels, etc. from steel, stainless, copper, brass, and other metals.

26. **D-C Power Supplies.** General Electric Company. 12 pp. Ill. Bulletin lists the features, operation and applications for various custom-built dc power supplies for computers, aircraft, missiles, and other military applications.

27. **New Flexible Tubing.** Flexible Tubing Corporation. 6 pp. Ill. Manual explains the construction and applications of a new kind of flexible tubing for handling air, liquids, and light solids. The tubing is basically a synthetic material— treated cotton, fibrous glass, dacron, nylon, or other material, depending on the application—supported by a coiled spring. Advantages of the tubing are said to be light weight, extreme flexibility, fast installation, broad temperature range, flame resistance, water resistance, abrasion and chemical resistance, and a wide choice of sizes.

28. **Proximity Switch for Press Stamping Operations.** Robotron Corporation. 32 pp. Ill. Booklet gives detailed installation procedures, operating instructions, and sketches of a simplified electrical circuit for the proximity die saver switch control system. The system is used in a stamping press to reduce the possibility of die breakage caused by multiple heading of non-ejected parts.

29. **Multi-Conductor Cable and Hook-Up Wire.** Times Wire and Cable Division, The International Silver Company. 18 pp. Ill. Catalog describes electrical conductors, strandings, shieldings, and insulation materials including Teflon TFE.

30. **Disc Grinders.** Besly-Welles Corporation, 8 pp. Ill. Catalog describes line of high-production precision disc grinders; both horizontal and vertical machines are shown.

31. **Industrial Ovens.** Trent, Inc. 12 pp. Ill. Booklet describes a complete line of industrial high temperature, recirculating, gravity, and forced convection ovens.

32. **Industrial Instruments and Controls.** Instruments, Inc. 12 pp. Ill. Catalog has information on line of liquid and granular solid level controls including gamma radiation, capacitance, float actuated, electronic, pneumatic, and mechanical.

33. **Tubular Laminated Fiberglass Components.** Pacific Laminates, Inc. Handbook discusses current technical limits, advantages, terminologies, production characteristics, and specification outlines for tubular laminated fiberglass components.

Miscellaneous

34. **Sound Insulating Partitions and Floors.** Metal Lath Manufacturers Association. 4 pp. Ill. Technical bulletin gives sound transmissions loss figures in different types of partitions, including solid studless, solid with channel studs, wood studs, prefabricated metal studs, and others.

35. **Screw Thread Technology.** H. M. Harper Company. 16 pp. Ill. Booklet offers basic introduction to varied types of threads; outlines their history, defines the terminology used in the industry, and explains with diagrams the differences between the major kinds of screw threads.

36. **Calcium Carbide.** National Carbide Company. 16 pp. Ill. Brochure discusses calcium carbide and its derivative acetylene.

37. **Metallic Bronze Powder.** Crescent Bronze Powder Company. Color chart shows 44 metallic bronze, gold, copper, and aluminum powders.

38. **High Temperature Coatings for Metal.** Dampney Company. Booklet describes complete line of silicone and silicone-ceramic heat resistant coatings for metal protection at high temperatures.

39. **Springs.** Alco Products, Inc. 8 pp, Ill. Booklet contains formulas, drawings, and data for all types of hot- and cold-wound springs.

40. **New Heat Transfer Cement.** Thermon Manufacturing Company. 4 pp. Ill. Bulletin describes use of heat transfer cements for electric resistance heaters, and introduces a new cement known as Thermon T-63 which can be used in temperature ranges from 600 degrees F. to 1250 degrees F.

41. **Batteries.** Yardney Electric Corporation. 10 pp. Ill. Brochures describes the physical, electrical, and typical application characteristics of rechargeable silver-zinc batteries. Also included are scale cell drawings and photographs of applications.

42. **Fiberglas Textile Fibers.** Owens-Corning Fiberglas Corporation. 52 pp. Ill. Booklet contains complete data on Fiberglas textiles for industry. Subjects include yarns, threads, strands, rovings, fabrics, tapes, applications, and an explanation of how the material is made and fabricated.

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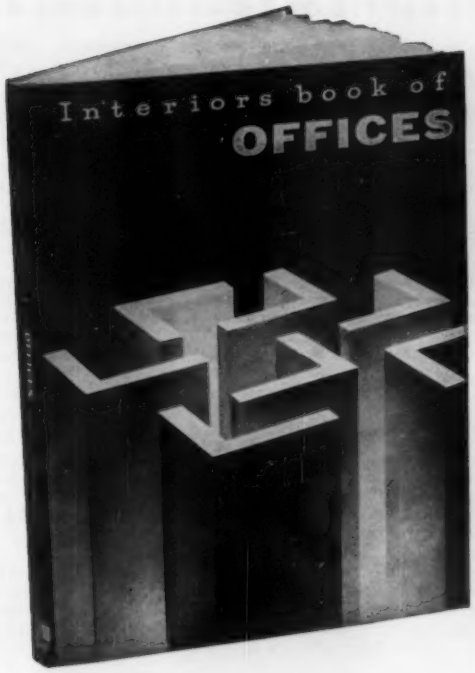

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For Your Calendar

Through August 21. "Japanese Art Treasures from the Honolulu Academy of Arts," an American Federation of Arts Golden Anniversary exhibition. Seattle Art Museum, Seattle, Washington.

Through August 31. Sixth annual summer program of the American Management Association. Courses and workshops range from three to five days, and topics cover every phase of management. Colgate University, Hamilton, New York.

Through August 31. Models and plans for the Southwest Washington waterfront redevelopment on display at the Gallery of The American Institute of Architects in the Octagon 1741 New York Ave., N.W., corner 18th St., Washington, D.C.

Through September 2. Annual summer session of the Brooklyn Museum of Art. Brooklyn Museum, New York.

Through September 6. "Art Nouveau." A comprehensive exhibition which includes paintings, architecture, photographs, furniture, design objects, books, posters, and jewelry. Directed by Peter Salz and installed by Arthur Drexler. Museum of Modern Art, New York.

Through September 11. "Designer-Craftsman U. S. A.—1960." Exhibition of 114 objects selected in a competition entitled "Designed and Handcrafted for Use," sponsored by the American Craftsman's Council. Museum of Contemporary Crafts, New York.

Through September 4. 1960 Triennale de Milano. Palazzo dell'Arte and Parco Sempione, Milan, Italy.

August 8-19. Courses on vibration testing being offered by Ling Electronics at their plant in Anaheim, California.

August 15. Beginning of several of the five special mid-summer courses for engineers offered at UCLA by University Extension's Engineering division, Los Angeles.

August 15-17. "Heat Transfer Conference and Exhibit" sponsored by the American Society of Mechanical Engineers and the American Institute of Chemical Engineers. Statler Hilton Hotel, Buffalo, New York.

August 18-19. Electronic Packaging Symposium at the University of Colorado sponsored by their Engineering Department, Bureau of Continuation Education, and Electrical Design News. Boulder, Colorado.

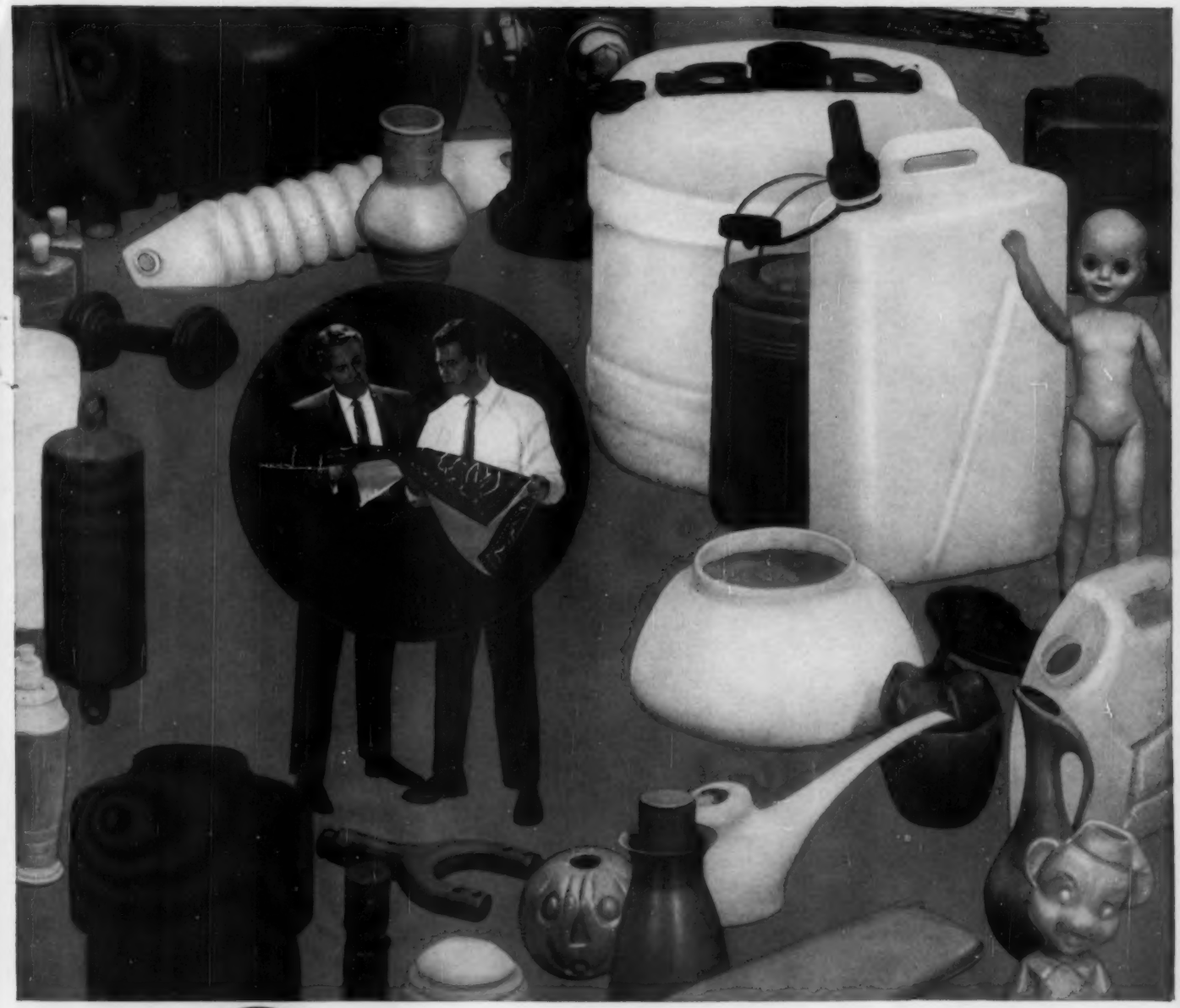
August 22-26. Thermonuclear Plasma Physics Symposium sponsored by Oak Ridge National Laboratory, Oak Ridge Institute of Nuclear Studies, and the U.S. Atomic Energy Commission. Oak Ridge, Tennessee.

August 30-September 1. Prospects and Challenges, a conference sponsored by the Southwest Region of the American Craftsmen's Council. University of California at Santa Barbara, California.

September 7-17. "Designing with New Materials, Methods, and Processes." Workshop conducted by Design Division, Boston Institute of Contemporary Art, at Endicott House, Dedham, Massachusetts.

September 12-16. "Technical Report Writing." A course for engineers and scientists offered at UCLA by Extension Engineering, Los Angeles.

September 26. Beginning of weekly evening design course for New England designers and engineers at the Boston Institute of Contemporary Art, Soldiers Field Road, Boston 34.



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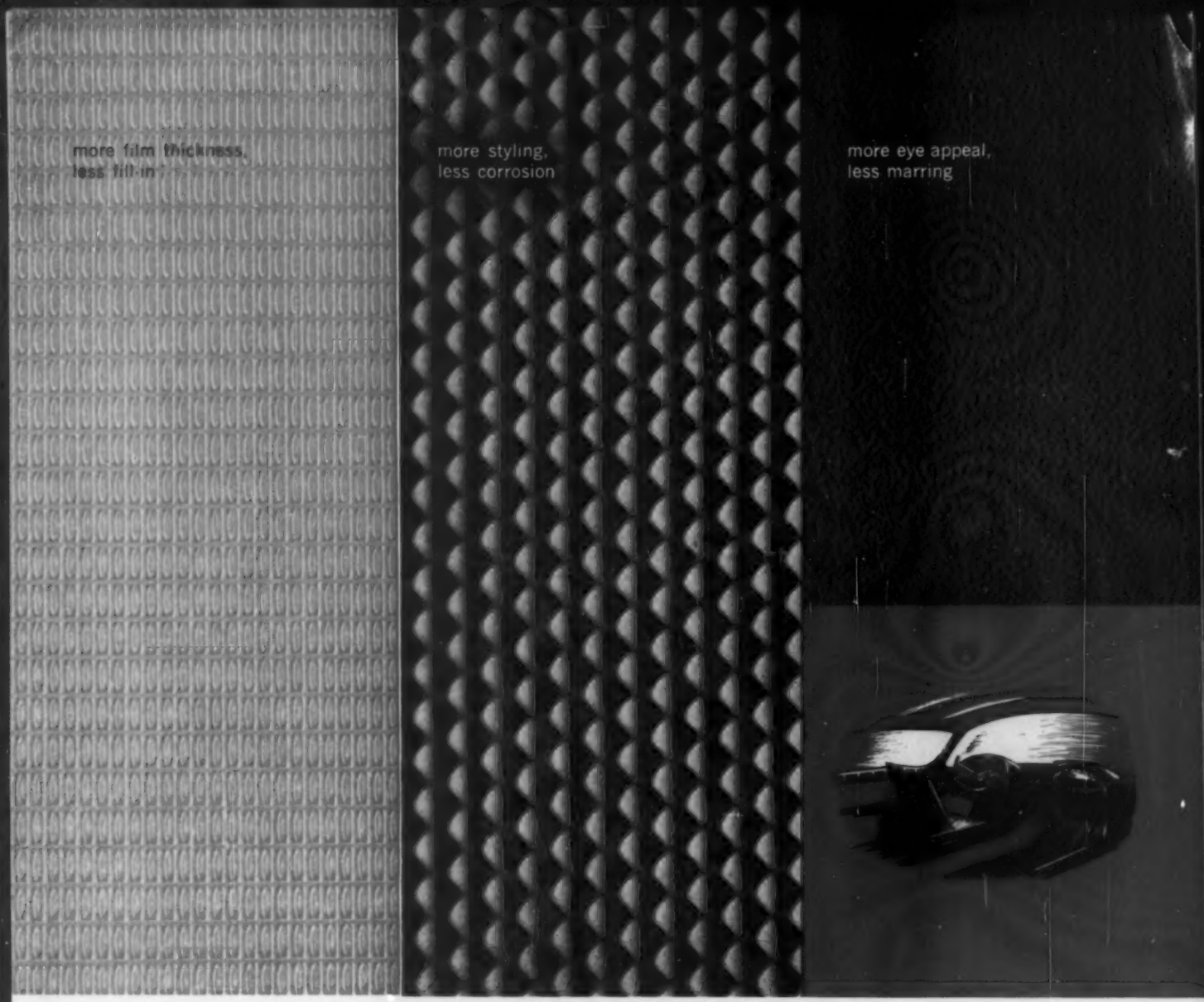

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