# INDUSTRIAL DESIGN

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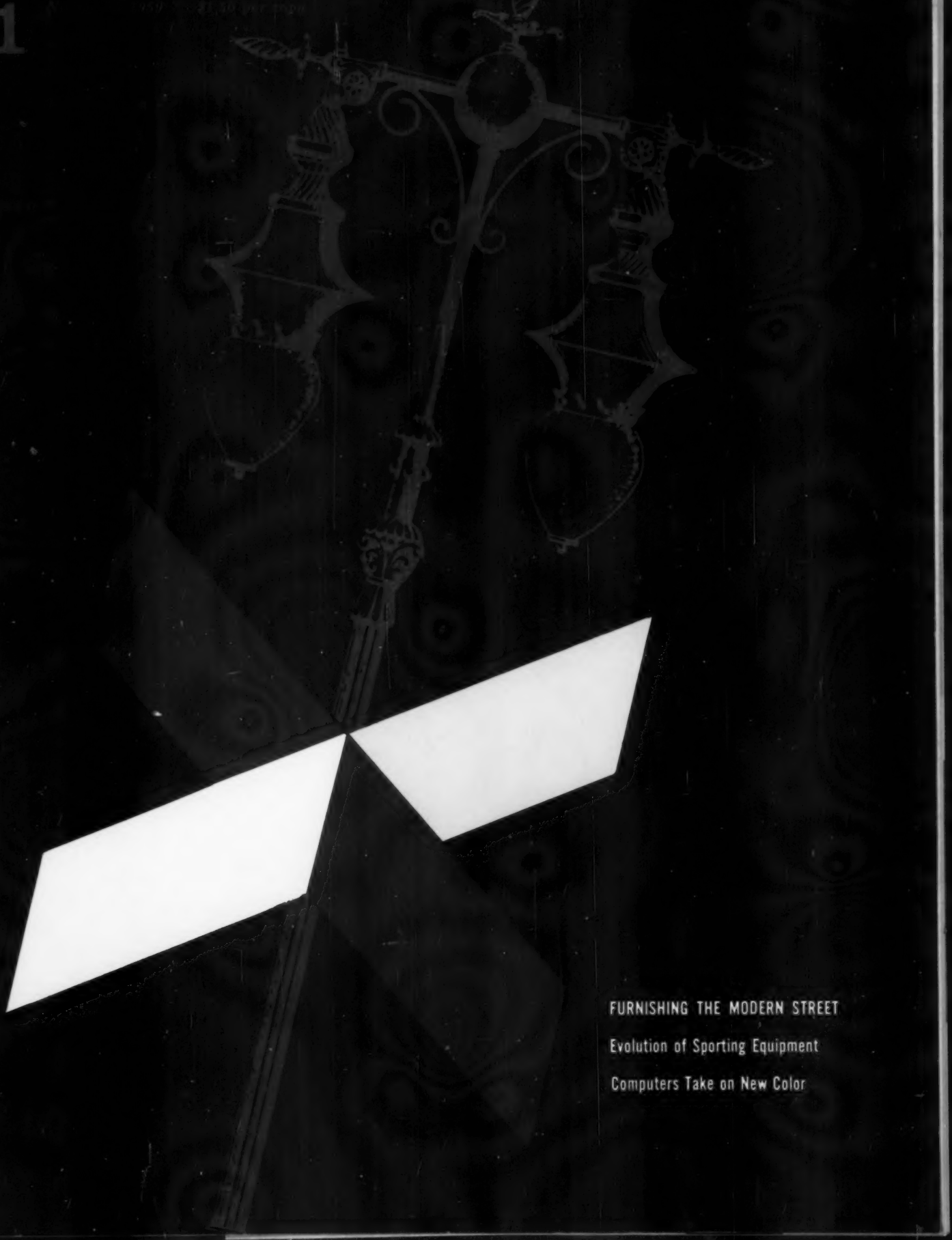

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COVER: The original patent drawing for an arc lamp post, invented

NOVEMBER, 1959 VOLUME 6 NUMBER 11

# INDUSTRIAL DESIGN

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*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 DECEMBER—Sixth Annual Design Review: a collection of the year's significant developments in consumer and industrial products.*

*IN JANUARY—Mechanical Fasteners, Part II in the series on fasteners and fastening techniques; the package and the corporation.*

COVER: The original patent drawing for an arc lamp post, invented by Richard Bowker and dated 1894, lights our cover this month. The lamp itself still lights parts of New York.

FRONTISPIECE: A trio of street lamps from Consolidated Edison's files illustrates the varied traditions in street furniture discussed more fully on pages 36 to 51.


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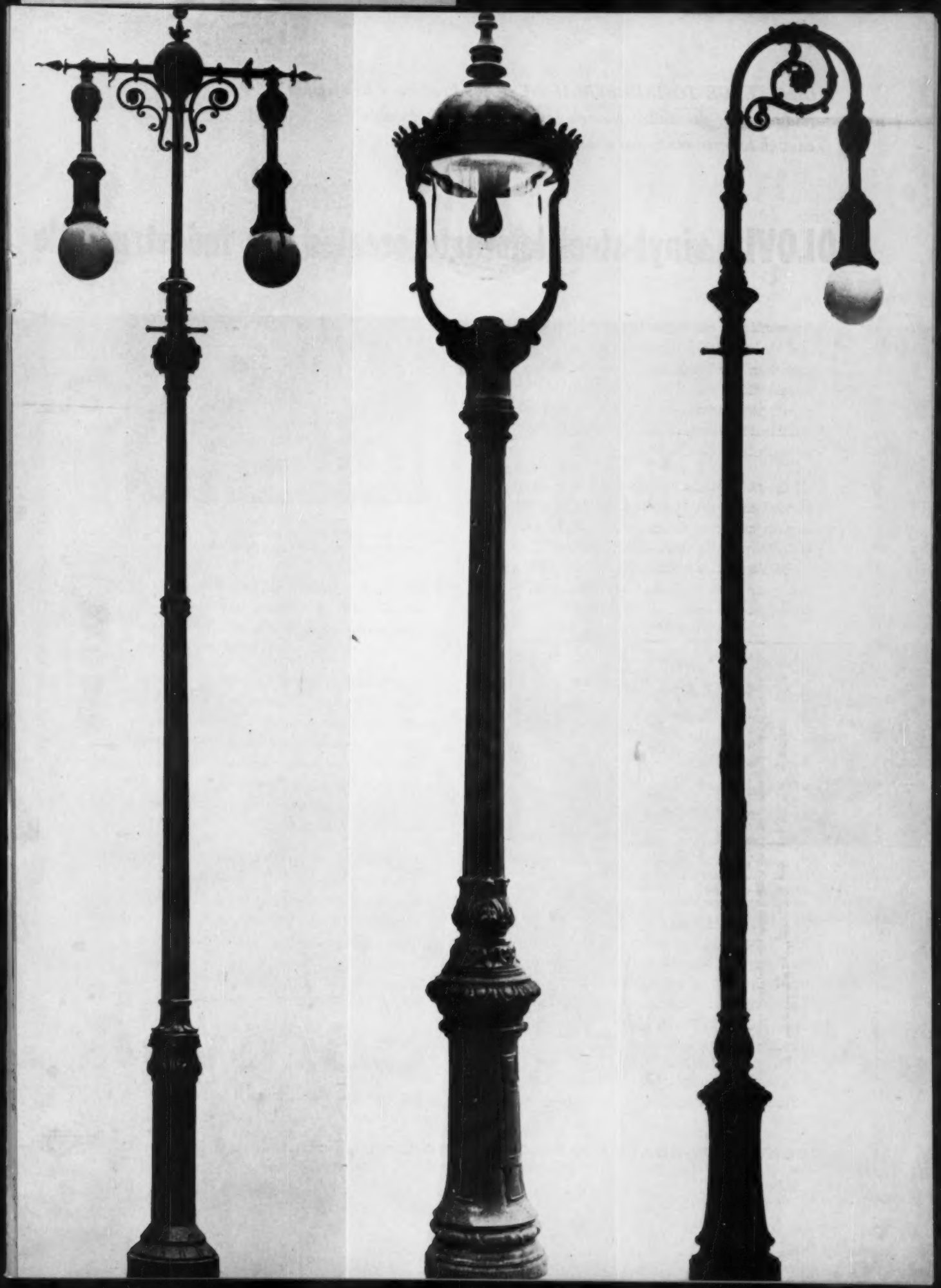

*CHALLENGE TO INDUSTRIAL DESIGN: Produce a lightweight folding table decorative enough for party use, yet durable enough to resist every-day abuse.*

# COLOVIN vinyl-steel laminate creates the indestructible

**Samsonite set out to produce** a folding table and chair set that would have much wider use than the occasional game of bridge. Specifications called for styling suitable for the "show" rooms of a home, ruggedness sufficient to withstand the rigors of playroom or workshop.

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# "Magic Top" of this handsome Samsonite table

# in this issue...

*The Huxtables*

**Ada Louise and Garth Huxtable,** the husband and wife design team responsible for the serving pieces in The Four Seasons restaurant (page 78), have had their own office since 1952. Mr. Huxtable, an industrial designer for 25 years, has worked in every area of the profession, from graphics to architecture; Mrs. Huxtable is a well-known writer on architectural subjects.

*Kaplan*

**Archie Kaplan,** assistant to the president of Designs for Business, teaches a course in human engineering at the Parsons School of Design that is part of an intensive human factors program in the school's design department. The article on page 88 is based on a study by Mr. Kaplan, growing out of his conviction that designers were not generally aware of the latest thinking in the application of human engineering to industrial design.

**John Vassos,** consultant designer to RCA in the development of the new 501 EDP computer (page 52) is a Fellow, one of the founders, and a past president of the Industrial Designers Institute. He is famous for having taken the fins off his Cadillac, has just designed the sets for an off-Broadway production of *Iphigenia in Taurus.*

**Stewart W. Pike,** manager of functional design for the Industrial Electronic Products department of RCA, came to his present profession via architecture; he is a graduate of the University of Pennsylvania's School of Fine Arts. Like Mr. Vassos, who worked with him on the 501-EDP computer (page 52), he is a Fellow of IDI.

*Vassos*

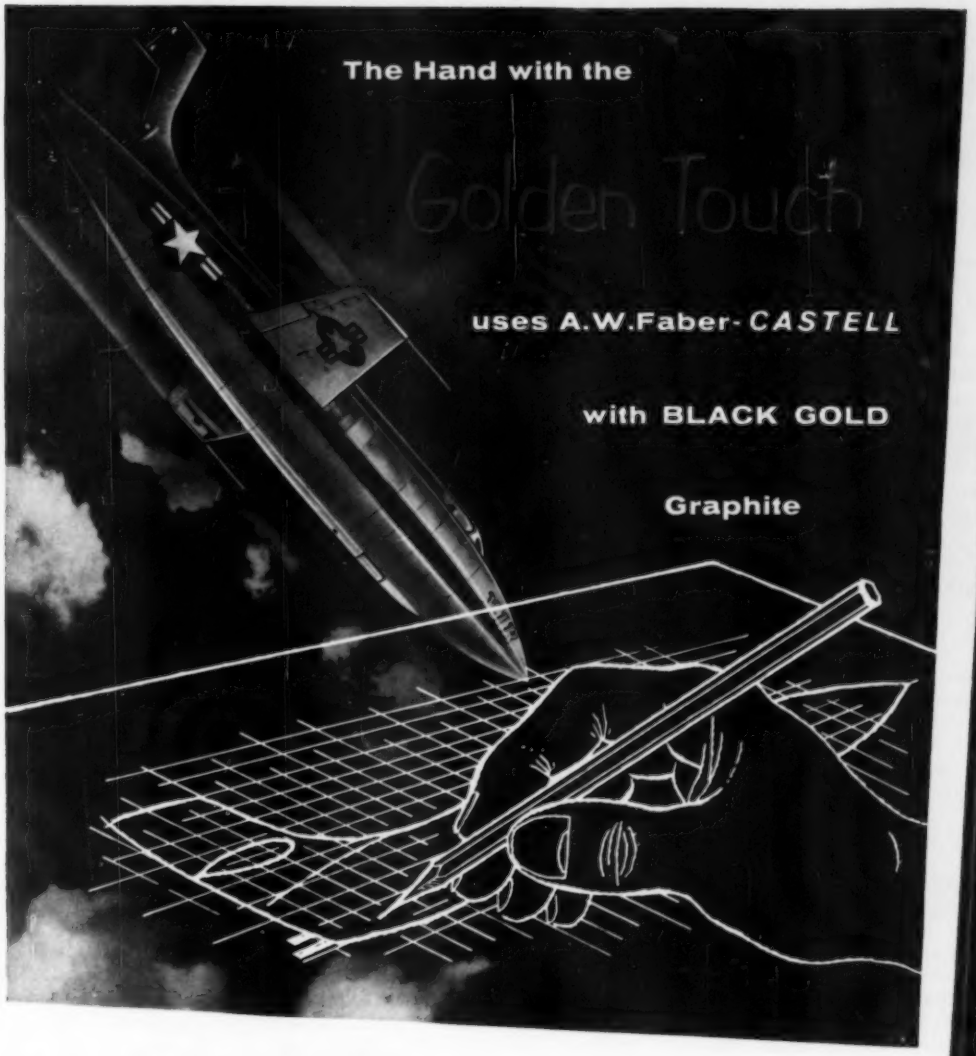
*Pike*

**George McAuliffe,** contributor of the review of the new Guggenheim Museum (page 66) has a degree in English and Art History from Yale, was display manager of Pepsi Cola International for four years, is now studying architecture at Pratt Institute. His interests outside of art and architecture include sailing, the sea, and marine zoology (he once worked, for a year, on a seagoing tug whose ports-of-call were the islands of the Caribbean).

*McAuliffe*

*Manus*

**Willard Manus,** who wrote the article on the evolution of baseball and football equipment (page 70), is a freelance writer who has also had considerable player-participation experience in both these sports: he is a veteran sandlot player, and attended Adelphi College on a football scholarship. In addition, he is the author of three novels, one of them—*The Fixers*—dealing with the basketball fix scandals of 1952.

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# LETTERS

### Unravelling the complex controls

Sirs:
On my desk this morning was a copy of the September issue of INDUSTRIAL DESIGN which contained the excellent article, "Behind the Panel." Congratulations on an excellent job in separating fact from fancy and masterfully presenting in a very readable and understandable fashion a subject that is most complex.

GEORGE A. STAUTER
*Minneapolis-Honeywell Regulator Co.*

### The producer as consumer

*Sirs*:
Arthur Gregor's article "Behind the Panel" in the September issue of ID was extremely timely. The comprehensive and authoritative handling of control panel systems emphasizes a growing nonconsumer industry which is becoming more and more aware of professional design services as an industry tool.

Automation continues to increase as a prime industry tool. Control panels must become larger and more complex to control, compute, and regulate additional industrial tasks fed to new and larger machinery. Simplicity, readability and human engineering factors are most vital for precision operation; yet machine styling and design is necessary to command profitable sales (a consideration always given to the design of consumer products). Good industrial design is usually the result of an "honest" design solution by professional industrial designers; a marriage of machine design and marketing. More and more manufacturers of products produced only for industry are utilizing the services of industrial designers not only for new product design, but for packaging and graphics. I think it will be a happier marriage.

DAVID DABNEY
*Raymond Loewy Associates*

### "The Package"

Sirs:
As a designer, I fully agree with the basic criticism ID has with the format of the Museum of Modern Art's package exhibit. I too consider the show confusing in regard to grouping the packages in the classification of materials and uses. However, I want to congratulate the Museum in having shown the package in its purest form by removing identifying surface treatment and letting the container speak for itself through sheer structure and choice of ingeniously used materials. After all, when we consider the problem of packaging, we have to approach the matter first from its functional aspects. The surface design is essentially decorative. The consumer is often only slightly aware of the actual form of the package, having been attracted by the surface treatment and seduced by the sales pitch.

The Museum had undertaken the job of awakening the buying public to the enormous variety of interesting devices which they handle daily, stimulating their awareness of the beauty, fascination and ingenuity of these packages. It was not concerned with the sales potential of the package, but rather sought to stimulate the public's esthetic sensibilities to form. I must say, however, that I was astonished that, in putting their show together, they overlooked some of the oldest and most commonly used packages today, such as the tin can, the folding box and others which basically are good forms. I also regretted not seeing more from other countries because I feel that there is a wealth of interesting material produced, considerably more exciting than those shown.

I hope that the Museum will continue to be such an eloquent advocate of good design but I suggest that, in the future, the director of the exhibit be guided by the design group actively engaged in the particular field.

ERNEST EHRMAN
*New York*

### Antidote to Quote

Sirs:
I hope that student job-hunters who see me quoted on page 51 of the October, 1959 issue will take page 56 as an antidote. We welcome imaginative graduates; we just want them to keep learning.

WILLIAM C. RENWICK
*New York City*

### Apprenticeship Problems

Sirs:
Bravo! for your article in the October issue of "Industrial Design" entitled "Beginning a Career." The writers are to be congratulated for their thorough, forthright, and realistic appraisal of the problems facing the young I. D. graduate today.

As the parent of an industrial design student, I am only too familiar with the various problems discussed in the article. The picture is not a pretty one and the future of an industrial design student is indeed hazardous. The school my son is in requires a five-year course of study. This, to say the least, is costly, and where do we go from there?

The profession which is, more or less, still in its infancy, must be made aware that it has a moral obligation to the young graduate if it is to be respected as a profession. Seminars are constantly being held on how the course of study can be enlarged, enriched, etc. But after all the years of study what is being done in a really practical way to absorb the graduates? The fault, it seems to me, lies largely with the top flight designers themselves. They are the ones who refuse to hire the young graduate because they can't be bothered to train him, and they are the ones who set the pace for the entire profession. The effect on a young person, carrying his portfolio from design studio to design studio, and being turned down because of lack of practical experience, is devastating indeed. The law and medical professions have solved this problem in a practical way. Can anyone imagine a young doctor upon graduation from medical school going around by himself looking for prospective patients upon whom to practice his profession? If industrial design is to become a respected profession, as law and medicine are, it must wake up and treat its members with respect. Only in that way will it attract and keep the talent it deserves. The answer does not lie with attracting more and better schools, such as Harvard or MIT. The answer seems to me to lie with a definite program of apprenticeship perhaps, or in a willingness to help and encourage the young student in the field itself, not necessarily in the classroom. This is a moral issue which must be faced practically by those who call themselves "Industrial Designers."

DOROTHY G. HOROWITZ
*New York*

### Errata

Jack Collins was incorrectly identified as Jack Cullen in the caption on page 70 of our September issue.

In the article "Behind the Panel," September ID, the circuit breaker pictured on page 53 was inaccurately credited to Raymond Loewy Associates. The circuit breaker was designed by the Low Voltage Development Department of the Federal Pacific Electric Company. On page 54, the White Roger air conditioning controls is a Raymond Loewy design. This is a modification of an existing unit with the addition of the push-button unit.

# DESIGNED IN CELANESE FORTIFLEX...

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Air Conditioner Condensate Drip Pan
Injection-molded of Celanese Fortiflex A
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**Properties of Fortiflex "A" Related to Melt Index**

| PHYSICAL PROPERTIES | ASTM METHOD | UNITS | FORTIFLEX RESINS A-20 | A-70 | A-250 | A-300 |
|---|---|---|---|---|---|---|
| Melt Index | D-1238-52T | — | 0.2 | 0.7 | 2.5 | 5.0 |
| Heat Distortion Temp. (66 psi) | D-648-45T | °F. | 185 | 185 | 180 | 180 |
| Brittleness Temp. | D-764-52T | °F. | —200 | —180 | —160 | —100 |
| Impact Strength, Izod (1/4" x 1/2" injection-molded bars) | D-256-54T | ft. lb./in. notch | 23 | 18 | 13 | 3 |
| Tensile Strength, Max., 0.2 in./min. | D-638-52T | psi. | 3700 | 3600 | 3500 | 3300 |
| Elongation, First Tensile Yield Point | D-638-52T | % | 25 | 25 | 25 | 25 |

**Properties of Fortiflex "A" Not Affected by Melt Index**

| PHYSICAL PROPERTIES | ASTM METHOD | UNITS | VALUE |
|---|---|---|---|
| Density | | g/cc | 0.96 |
| Refractive Index | D-542-50 | $n_D^{25}$ | 1.54 |
| Hardness, Shore D | D-676-49T | | 65 |
| Stiffness | D-747-50 | psi. | 150,000 |
| Water Absorption (1/8" specimen, 24 hr. immersion @ room temp.) | D-570-54T | %, wgt. gain | <0.01 |
| Flammability | D-635-44 | in./min. | 1.0 |
| *Mold Shrinkage, length | | in./in. | 0.03 to 0.05 |
| width | | in./in. | 0.02 to 0.04 |

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*From left to right; Bordinat, Doner, Miller, and Griswold*

**Officers elected at meeting of IDI**

The annual meeting of the Industrial Designers Institute held in Chicago last month included the election of officers, an exhibition of members' work, and several speeches of interest to designers.

The following officers were elected at the Board of Trustees Meeting: President—H. Creston Doner, design director, Libby-Owens-Ford Glass Company; chairman of the board—John S. Griswold, of Griswold, Heckel & Kaiser Associates; executive vice-president — Leon Gordon Miller, of Leon Gordon Miller Associates; national secretary—Theodore G. Clement, design director, consumer and overseas products, Eastman Kodak Company; national treasurer—Eugene Bordinat, Jr., chief stylist, M-E-L Division, Ford Motor Company.

Each of the officers has held chapter office and has been active on committees of the IDI. At a dinner during the convention, H. Creston Doner and Leon Gordon Miller were formally made Fellows of the IDI.

An exhibit consisting of photographs of product design, graphics, and furniture by IDI members was on show at the American Furniture Mart during the time of the IDI convention. The display was actually in two parts. One was the 1959 National Conference Design Exhibit, designed by Howard Sersen of Illinois, which consisted of panel installations on which were mounted photographs of products and graphics. The other was "SCOPE," the IDI Ohio Valley Exhibit, in which several actual products were shown, among them a "space chair," a chair for a space ship, designed by Charles Dempsey.

The National Exhibit is scheduled for display in other cities.

Among talks given during the meeting was a discussion of legal protection for industrial designers by Alan Latman, Counsel and executive secretary of the National Committee for Effective Design Legislation (NCEDL). Mr. Latman said that existing legislation is inadequate to protect designers from piracy, and supported the new Senate bill, sponsored by Senators O'Mahoney, Wiley and Hart, which provides for a Government-administered design registration system offering protection for commercial designs. The bill will make it possible for a design owner to recover costs from anyone who, without his authority, makes or imports articles embodying a copy of the original design.

Latman appealed to IDI members to aid the passage of this bill, urging them to write to the sponsors; to show the NCEDL specific illustration of design piracy; and to give the NCEDL financial support.

George Frost, Chicago attorney, agreed with Latman and argued that present design laws were obsolete. He said "application of either the (present) design patent law or the copyright law to industrial designs often leads to anachronisms, troublesome administrative problems, and cumbersome technical requirements."

John Pile of George Nelson and Company also spoke, and showed, with slides, examples of design piracy. He argued that these examples of copying could be to a great extent eliminated by efficient legislation.

On October 23, Dr. Burleigh B. Gardner, executive director of Social Research, Inc., spoke on motivation research. "Measure of the effectiveness of a product or piece of communication is not whether people like it," he said, "but whether they are *influenced* by it." What influences a person to buy are the "symbolic meanings," of a product; the memories or ideas which an object evokes, independent of its efficiency, and often, of its actual function.

Status and class played a part in design, Dr. Gardner said. The working class goes in for "an over-elaboration of detail." They demand that an object should be pretty or "cute." The objects of the upper class, however, are apt to be a hodgepodge. "These families," said Dr. Gardner, "have so much confidence in their own status that they feel they do not need to impress anyone."

"The anxious middle class, on the other hand, is constantly striving to put on a proper face to the world." It is they who have a preoccupation with good taste, and need reassurance. Whether they realize it or not, Dr. Gardner argued, designers, home economists and other style-conscious groups are designing for the middle-classes and are attempting to "educate the world to be upper middle-class in taste."

Dr. Gardner offered a formula to designers. Ask yourself, he counselled, (1) what practical need should the object serve? (2) how will the object communicate in terms of making the consumer say "*That's* the one I like," and (3) what is the target? Are you producing for a certain class, a young or old person, a man or woman, or something for everybody? "The better the communication," he said, "the better the results."

*IDI members view exhibit of IDI work*

customized decorative metal...

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### Conference officers chosen

The officers for the International Design Conference for 1960 at Aspen, Colorado, have just been announced.

Bill Tara, Los Angeles design consultant, has been named chairman. Jack Roberts, executive vice-president of Carson/Roberts, Inc., of Los Angeles, is the first vice-chairman; Hy Hoffmann, of the Kimberly-Clark Corporation is second vice-chairman; Burton Cherry, of Burton Cherry & Associates is secretary; and Morton Goldsholl of Morton Goldsholl Design Associates of Chicago, is treasurer.

Named to the executive committee were Ted Rand, Graphic Studios, Seattle; Brian Heath, Heath Ceramics, Sausalito, California; Albert Kner, director, design laboratory, Container Corporation of America, Chicago; Bruce Beck, Bruce Beck Design, Chicago; Herbert Bayer, chairman of the department of design, Container Corporation of America.

*Tara*

The details of the 10th anniversary conference to be held in Aspen next June will be announced this fall, according to program director George D. Culler, director, San Francisco Museum of Art.

### PDC elects and discusses

At the Package Designers Council's seventh annual meeting, Karl Fink was re-elected president; May Bender was elected secretary, and Ernst Ehrman became the new treasurer. Harry Lapow, Robert Neubauer, and Robert Zeidman will begin three-year terms as members of the board of directors.

Mr. Fink announced a membership increase of 21 per cent during the past year, and the formation of a Midwest chapter, with headquarters in Chicago. The new chapter has elected Morton Goldsholl chairman, and Rene Burvant and Robert Sidney Dickens vice-chairman and secretary-treasurer respectively.

Besides the installation of officers, the main business of this year's meeting was a discussion of the Museum of Modern Art's packaging exhibition (ID, October, page 76). Walter Margulies, president of Lippincott and Margulies, Inc., represented the professional designer, and Mildred Constantine, Associate Curator of Architecture and Design at the Museum, explained the Museum's position.

After congratulating the Museum for "the effective manner in which they have presented packaging as an art form to the public," Mr. Margulies pointed out areas of disagreement. "Passive and passionless, the packaging exhibit just fails to communicate the vital nature of packaging in the present day world," according to Mr. Margulies, who went on to say: "We feel it makes no sense to design for an avant-garde or art-critic public. That is the function of the artist, not the industrial designer."

A more serious charge made by Mr. Margulies was that the Museum was guilty of a "dangerous commercialism" in allowing the show to be sponsored by three manufacturers of packaging materials (Container Corporation, Reynolds Metals, and the National Distiller and Chemical Corporation). "We were surprised to see the Museum so badly used," said Mr. Margulies. "For what, we wonder, is the difference between supplier-sponsorship of a packaging show, and the canvas or bronze manufacturers sponsoring a painting or sculpture exhibit? . . . I think the public has been done a grave injustice. Good design, like good painting and good sculpture, should make a point. This show made no such point; it was simply a vehicle for the display of technical innovation, and as such a gratuitous promotion for some of our largest packaging suppliers."

Miss Mildred Constantine opened her remarks with the statement that, as a curator, she was dedicated to the proposition 'that anything that is man-made is man-designed, and anything that is designed is the concern of the Museum of Modern Art." She pointed out that since the Museum is not a business, its way of looking at a package has nothing to do with the package's effectiveness in stimulating profit.

In the spirited discussion period (during which all questions were addressed to Miss Constantine), the curator was asked whether the telephone that was included in the show would function without the skin.

Answer: "No."

Question: "Then isn't it part of the product? How can it be a package?"

Answer: "Do you define a package as being separate from the object? Can you separate toothpaste from its tube?"

Question: "Yes, because I brush my teeth with the toothpaste."

Answer: "It could not be served to you unless it was packaged."

When someone objected to the Museum show's very slight coverage of graphics, Miss Constantine replied: "Where we exhibited graphics we were making a subtle statement that the packages we showed were beautiful, and that 99 per cent of our packages are not beautiful."

Regarding the question of sponsorship, Miss Constantine said that there was nothing unusual about a show's having industrial sponsorship, and that the Museum always acknowledges such support.

The last voice of the evening was a package designer's dissenting one. Harry Lapow, of Harry Lapow Associates, confessing himself "more and more in the enemy camp," expressed his enthusiasm for the exhibition and his conviction that it was a challenge to all designers concerned wth packaging to do better work.

### Local IDI elects officers

The Southern New England Chapter of the Industrial Designers Institute held their elections for executive officers last month and the following members were elected.

Chapter chairman — George Goshco, George Goshco Associates, N. Y.; vice-chairman—Edward Conroy, International Silver Company, Connecticut; secretary—Raymond T. Cassidy, Remington Shaver Company, Connecticut; treasurer—Gerald Ewing, consultant designer, Connecticut; trustee—Joseph Parriott, Raymond Loewy Associates, New York.

### Trade fair goes to Lima

The First Pacific International Trade Fair held last month in Lima, Peru, contained an extensive U. S. Exhibit designed by Raymond Spilman of New York. Over one hundred American Manufacturers contributed products or machinery to the show which took as its theme "Better Production for Better Living."

*Fink*

*Roberts*

*Rand*

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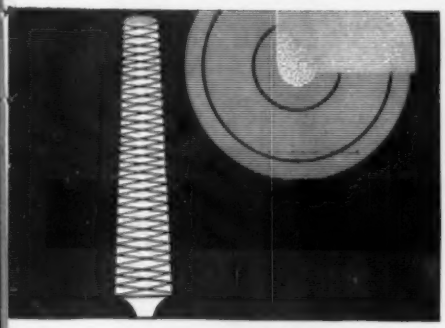
*Bayer*

*Beck*

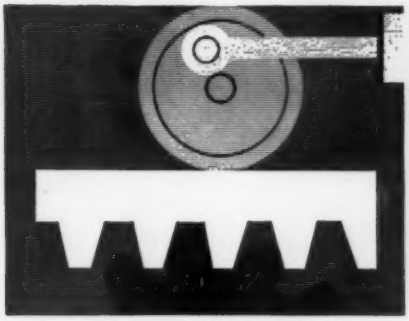
# specify urethane elastomers

## for functional end products with maximum engineering properties



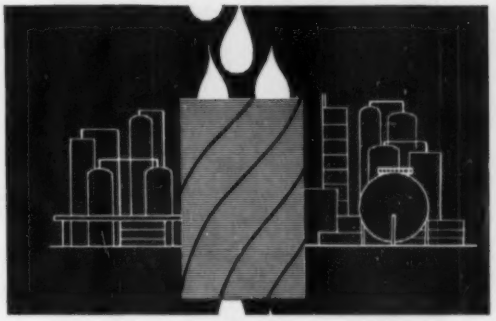
### wear resistance

The combination of high tensile strength, abrasion resistance and tear strength results in long service life for parts cast of urethane elastomers.



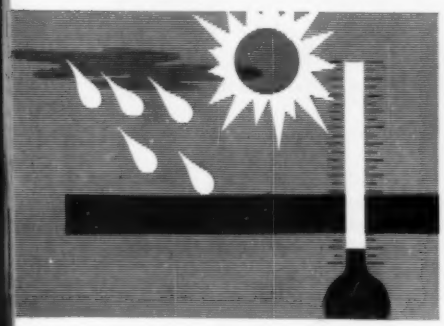
### controlled friction

Urethane elastomers have a high coefficient of friction ideal for drive units, or can be modified to be self-lubricating.



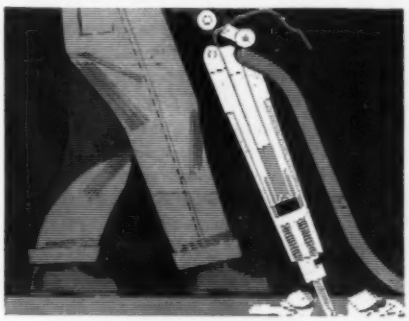
### solvent resistance

Urethane elastomers have superior solvent resistance. Oil immersion at 130°C for 100 hours shows little loss of properties.



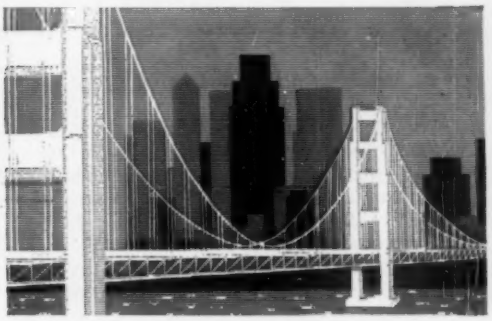
### aging resistance

Urethane elastomers have excellent resistance to ozone, oxygen and weathering for longer service.



### shock absorption

Urethane elastomers are unique in their combination of high load-bearing, vibration dampening and shock absorbing properties. Rebound elasticity ranges from 45% to 60%.



### hardness with elasticity

Properties of high hardness, with high flexibility enable urethane elastomers to "bridge" a basic material gap between metals and rubbers.

Urethane elastomers offer opportunities to build into new or existing products a combination of desirable properties never before possible with a single material.

Urethane elastomers with a hardness range of 60 to 100 Shore "A" durometer, are tough yet elastic, have excellent tensile strength, high resistance to abrasion and oxidation. Softer grades exceed the strength characteristics of natural and synthetic rubbers; while harder urethane elastomers provide a structural and engineering material which combines high hardness and elasticity with other controlled properties, including high or low coefficient of friction.

Simple and inexpensive molds may be used to cast close tolerance parts incorporating undercuts, slots, tapers and integral inserts that require no further finishing.

***For complete details, use the handy coupon***

***The superior properties described in these references are obtainable only in urethane elastomers formulated with Mobay's Multrathane chemicals.***

Mobay supplies basic chemicals and technology for manufacturing urethane elastomers.

MOBAY

First in Urethane Chemistry

Mobay Chemical Company
Dept. IN-3 Pittsburgh 34, Pa.

I would like more information about the properties, uses and suppliers of cast urethane elastomers formulated from "Multrathane" chemicals.

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Company

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City, Zone, State E-1

*Rooms at Home Furnishings Show*

*Room at Hi-Fi show features stereo equipment*

**On show: hi-fi equipment**

The High Fidelity Music Show at the New York Trade Show Building last month was sponsored by the Institute of High Fidelity Manufacturers, an association of makers of audio equipment. The show celebrated the theme "Decorate Your Home With Music," and featured, in addition to displays by manufacturers of equipment, five model rooms which were designed by prominent interior decorators to illustrate the decor possibilities of high fidelity components or housings.

The model rooms consisted of a "provincial music room," a "contemporary living room," an "18th Century collector's study," and a "traditional living room," all of which contained modern hi-fi equipment for stereo sound.

More than 100 manufacturers showed their components in booths on the five floors of the building. The emphasis was on stereo sound; and on a return to the coordinated sound system housed in a cabinet. Television sets and records were exhibited in addition to the "pure" hi-fi equipment such as turntables, amplifiers and speakers.

Among the larger exhibits were a fully equipped recording studio and a small auditorium in which stereo sound was demonstrated to listeners.

**On show: homefurnishings**

The "Spirited Sixties" was the theme of the tenth annual National Home Furnishings Show held at the New York Coliseum last month. The show, sponsored by the American Institute of Decorators, featured ten model room settings by prominent members of the AID; dozens of product displays by manufacturers of home furnishings; and a complete house — called "The Carefree House for Carefree Living" —designed by John Vassos.

Many new products were incorporated into the room settings by the AID members, most of whom designed their rooms around a theme. One room was called "Breakfast by the Mediterranean," and included French doors and a balcony. Another, a bedroom "designed for the woman who likes to feel she possesses a femme fatale allure in her off-hours from being a busy executive," featured a canopied Louis XVI bed.

"A Winter Garden Room with an Oriental Flavor" (top left), designed by James C. Morse, is a setting to illustrate Greeff fabrics. The display is in pink, red, orange and light blue. Below, is an interior said to suggest an entrance foyer, designed by Ellen Lehman McCluskey. The floor, by William Gold, is called "Vigro-Matrix," and is composed of vinyl pebbles set in a bed of groutite, forming hexagonal shapes.

The complete house was a flat-roofed modern structure with six rooms, two baths, and a garage. The furnishings were chosen on the basis of requiring a minimum of upkeep. There were two patios, one at the front, and the other accessible from the kitchen in the back. The house itself was split into two levels by the raised living room. The exterior was of brown cedar planks accented by an overhang of white wood, bordered with an aluminum gravel-stop.

In conjunction with the show, AID members gave lectures to the public on aspects of decorating interiors.

**On show: office prerequisites**

The National Business Show, an annual exhibition of business machines of all sorts, was held at the New York Coliseum last month. The show was sponsored by the Office Executives Association of New York, and manufacturers of office equipment showed their latest products.

The majority of machines on display at this year's show were copying machines and collators, but the show included such oddities as a telephone with a germ-killing ultra-violet light.

Except for representatives of several foreign typewriter manufacturers, no manufacturer of typewriters or calculating machines exhibited at the show. The absence of exhibits by companies like IBM, Remington Rand, and National Cash Register was conspicuous in a show once dominated by this kind of equipment.

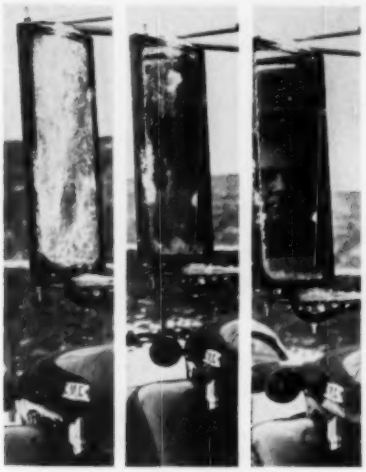
*Germ-killing telephone at Business Show*

# THIS IS GLASS

A BULLETIN OF PRACTICAL NEW IDEAS FROM CORNING

## NEW! A MIRROR THAT MAKES HEAT TO BEAT SLEET

You're jockeying a big trailer-truck along a winding road in New England. It's winter and you run into a real storm—a mixture of snow, rain, sleet. You flip a switch and . . .



Your outside rear-view mirror is *clear* in a matter of minutes. From a heavy coating of ice to *all* clear is only a matter of five minutes, even at −20°F.

The mirror, as you might guess, isn't just ordinary glass. It's one of Corning's PYREX brand glasses, and on its surface is an electrically conductive coating that's permanently fired in.

This coating (a metallic oxide) is what turns your mirror into a *heating* element when a current is applied. The heat melts ice and snow, prevents fog or drizzle from condensing on the surface.

If you use EC (electrical-conducting) glass for self-defrosting mirrors you get a bonus, since the coating also provides a non-glare surface.

But don't go away just because you gave up dreaming about driving a truck-and-trailer years ago. This PYREX® electrical-conducting glass comes in a wide choice of applications.

For example, there are some enterprising people who build radiant heaters, both portable and permanent, around such glass panels.

Comfort, safety, and convenience are the big selling points. Comfort because a panel of EC glass is an area *heat* source putting out long waves. Safety because there are no exposed wires or moving parts. Convenience since you have no burning, no need to do extensive remodeling in order to install it.

These same reasons have made PYREX brand radiant heating units attractive to industry—for heating, drying, curing, baking.

And, if you turn a panel of this glass *around*, it becomes an infrared reflector you can see through—blocking heat but still passing about 75% of the visible light.

Facts? Ask for PE-34, a 4-page data sheet, and/or PE-60, all about industrial heating units. Please use the coupon.

## HOW NOT TO FOUL UP THE WORKS

It's really very simple: If you're using spun insulation in electric motors, you have to keep the stuff from falling into the moving parts and fouling up the works.

Two things to keep in mind when selecting a material for this application: (1) It has to stand up to quite a bit of heat. (2) It *can't* be a conductor.

Some materials that are good insulators can't take the heat. Others function well at high temperatures but are not insulators.

*Glass* solves both problems. So, people who make electric motors build them with wedges made from PYREX brand glass No. 7740. (We supply the glass in rod form.)

This particular PYREX brand glass offers a number of useful characteristics. It is corrosion resistant and has a linear coefficient of expansion of 32.5 x $10^{-7}$ in/in between 0° and 300°C. Dielectric properties at 1 Mc and 20°C. are as follows:

| | |
|---|---|
| Power factor | .46 |
| Dielectric constant | 4.6 |
| Loss Factor | 2.1 |

**Wedges made from glass rod support spun insulation in electric motors. Glass is non-conducting and able to stand high temperature without deforming.**

You can get PYREX brand glass No. 7740 in a variety of forms—pressed ware, blown ware, plate, tubing, rod and panels.

Mechanical, thermal, electrical, and chemical properties of this glass and 27 others are spelled out in Bulletin B-83. Check the coupon for a copy.

## PLUMBING FOR POSTERITY

An increasingly popular fixture in labs, hospitals, schools, chem plants, and photo-engraving shops is the glass drainline.

With good reason. Glass drainlines are fashioned from PYREX brand glass No. 7740.

This is the glass that ends your worries about corrosion. For example, if you were disposing of waste hot hydrochloric acid, your PYREX pipe would still be around at the end of 200 years.

And glass is smooth; very little chance for block-up in the pipe. If such does occur, however, you can spot the exact point and take corrective action, without having to take down the whole system.

In fact, almost anything made from PYREX brand glass No. 7740 will be around for quite a while because this glass is able to cope with thermal shock and physical knocks, too.

Available in many forms—tubing, rod, pipe, plate, and all kinds of shapes.

Fill in the gaps in your files with these basic references: PE-30, all about glass drainlines; IZ-1, design considerations in glass. Any or all, free. Use the coupon.

## MORE ON PYROCERAM*

Developments in our new crystalline materials made from glass are treated at length in the third Pyroceram Progress Report. See coupon.

*Trade Mark

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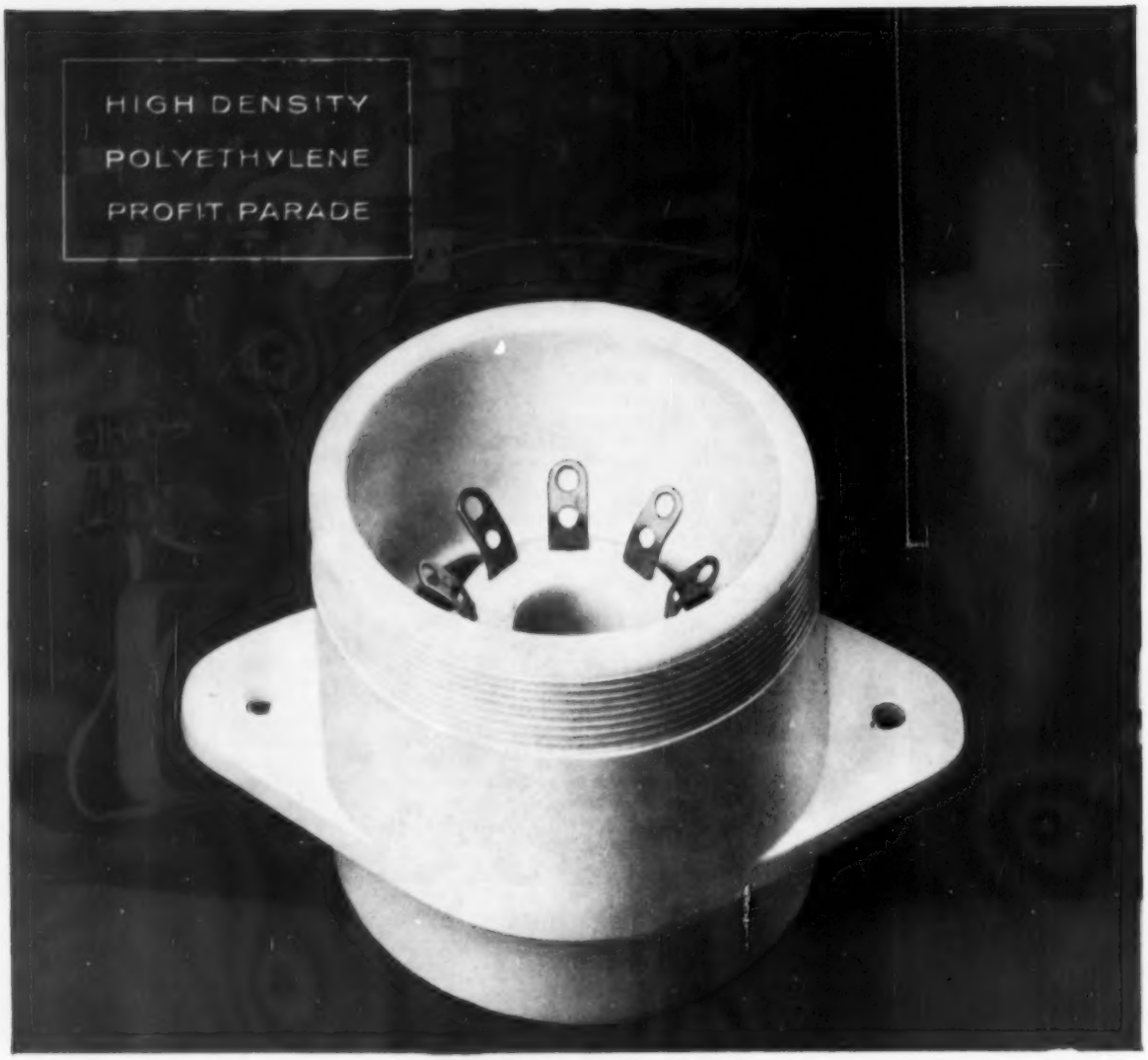
Please send me: ☐ PE-60, booklet on heating units; ☐ B-83, "Properties of Selected Commercial Glasses"; ☐ IZ-1 Design Manual; ☐ PE-30 Drainline Manual; ☐ Pyroceram Progress Report No. 3; ☐ PE-34, "Corning Flat Glasses."

Name ..... Title .....

Company .....

Street .....

City ..... Zone ..... State .....




# New Part Holds the Line Against Rising Costs

If you are battling to keep costs down you should know about Grex high density polyethylene. Reduction in manufacturing costs is one of the many advantages in specifying parts made of this new Grace plastic.

The TV tube socket shown here helps hold the line against rising costs for many leading manufacturers. It is injection molded for significantly less than is possible to produce competing sockets which can only be made by more costly fabricating methods.

Consider these other advantages of Grex. It is hard, stiff and tough enough to take a beating in installation or use without breaking, cracking or chipping. It is the only thermoplastic that can be boiled or frozen without losing its shape or impact strength. It has outstanding electrical insulating properties, is resistant to most corrosive chemicals and provides flame-retardance if required, as in this electrical application.

If these unique properties bring a Grex application to mind, decide to call in the experts on high density polyethylene now. Grace has the production facilities, technical service and experience to help put your product in the Grex profit parade. We're easy to do business with.

*Grex is the trademark for W. R. Grace & Co.'s Polyolefins.*

W.R. GRACE & CO.
POLYMER CHEMICALS DIVISION
CLIFTON, NEW JERSEY


Tube socket for TV sets demonstrates outstanding Grex electrical properties.

Take a look at the technical background on this socket for an idea of what you can expect to gain by specifying Grex for electrical equipment.

*Electrical properties.* High density polyethylene is one of the most effective electrical insulating materials available. The Grex compound in this socket has a dielectric strength (short time) of 475 volts per mil for ⅛" thickness. With such high resistivity the wall sections were kept thin for fast cycles and economical production. Another advantage of specifying Grex is the stability of its dielectric constant: this socket is stable from 60 cycles per second all the way up to 1,000,000 cycles per second.

*Molding considerations.* Injection molding of Grex resulted in considerable cost savings over compression molding of thermosetting materials. In order to meet electrical equipment safety requirements, C-1012 Grex flame retardant compound was chosen for the job. Of the five Grex flame retardant compounds available, C-1012 has the highest melt index—6.0—to provide the best flow characteristics and the impact strength needed for the socket.

*Mechanical properties.* The resiliency and high impact strength of Grex are particularly valuable in this application. While breakage due to riveting socket ears to chassis is a major problem with sockets made of other materials, high impact Grex sockets hold breakage to a minimum. Resiliency simplifies insertion of metal lugs which dig into sockets easily and hold firmly. Resiliency also saves time in installation of threaded caps which are simply pushed over the sockets without stripping threads.

*Interested?* If you have a job for high density polyethylene count on Grace for help. Now's the time to contact:

Technical Service Department
W. R. Grace & Co., Clifton, N. J.

*Coming in the December 1959 issue of*

## INDUSTRIAL DESIGN

As each year ends, ID wraps up the most significant things that have happened in product and packaging design in the preceding twelve months and puts them into a single issue, the Annual Design Review. Although intended as a survey, ADR has in fact become a guide to what has happened in the design field in the USA during a year's time, and as such, provides important insights into new developments and possible trends in materials, technics, and form. For many months ID's staff has been assembling, collating, and reviewing the design events of 1959. The following list is a sampling of the categories that will be represented in the December issue.

**Appliances** *ranges, refrigerators, dishwashers*
**Electric Housewares** *knife sharpeners, mixers, can openers*
**Non-Electric Housewares** *cutlery, cookware, cleaning tools*
**Tableware** *flatware, dinnerware, serving pieces*
**Furniture** *storage systems, tables, chairs*
**Decorative Accessories** *planters, ashtrays, desk sets*
**Lamps** *table, desk, floor, ceiling*
**Fabrics & Rugs** *drapery, wall covering, woven blinds*
**Tape Recorders, Radio & Television**
**High Fidelity Equipment** *tuners, turntables, speakers*
**Personal Items** *luggage, optical instruments, razors, pens*
**Photographic Equipment** *projectors, film processing devices*
**Garden Implements** *tools, mowers, outdoor cooking*
**Recreational Equipment** *camping, boating, hunting*
**Toys** *trucks, rattles, construction toys*
**Machinery** *forming, packaging, measuring tools*
**Prefabricated Building Components** *roofs, domes, umbrellas*
**Systems & Materials** *panels, grilles, partitions*
**Hardware & Millwork** *doors, windows, knobs, handrails*
**Finish Materials** *flooring, wall covering*
**Heating & Cooling Equipment and Controls**
**Plumbing Fixtures & Parts**
**Lighting Fixtures & Controls**
**Design Materials** *steel, plastic, aluminum*
**Power** *thermoelectric devices, reactors*
**Electronics** *tubes, transistors, capacitors, resistors*
**Business Machines** *tabulating, printing, copying*
**Business Furniture** *desks, chairs, storage units*
**Medical & Laboratory Equipment**
**Educational Materials & Equipment**
**Transportation** *ships, planes, highway design*
**Rolling Equipment** *fork lifts, farm machinery, earthmovers*

*Each issue of* **INDUSTRIAL DESIGN**
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### Company News

RETAINED: **Camden Associates** by Modernfold to design folding doors and wall coverings; by Pioneer Plastics Corporation, which makes high-pressure laminates, to design woodgrains and surfaces; by Federal Glass to design surfaces of tableware.

NEW OFFICES: **Paul G. Mathes**, Industrial Design, 918½ State Street, Quincy, Illinois; **James May Organization** is new name of Inspiré Design Studios, design counseling for home furnishing industries, 105 East 35th Street, New York 17, N.Y.

GOING PLACES: **Neal Goldman** Associates to 230 Park Avenue, New York 17, N.Y.; **Fred M. Gore**, Industrial Design to 2808 Oak Lawn, Dallas 19, Texas; **Bernoudy, Mutrux & Bauer**, Architects to 281 N. Lindbergh Blvd., St. Louis 41, Mo.

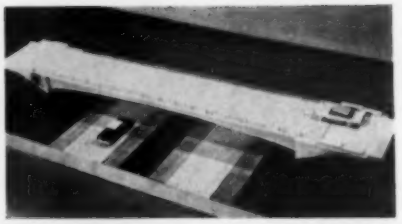
### Events, Competitions, and Projects

SHOWS: An exhibit entitled "The Science of Sound and Musical Tone" is being held at the Museum of Science and Industry of Chicago, sponsored by the museum and the Hammond Organ Company. Designer of the exhibit was Donovan Worland of Latham-Tyler-Jensen, Chicago . . . An exhibition of the work of architects honored by the American Institute of Architects in 1959 was on view at the Octagon last month in Washington, D. C.

EXPERIMENT: An experimental site for the first underground nuclear-bomb proof city is located about 35 miles from Albany, N.Y. Plans will be drawn by a group of graduate architects at Cornell University for a self-contained city which can function underground in the event of a nuclear attack. Cooperating in the program will be the New York State Civil Defense Commission; the U.S. Office of Civil Defense, and the New York Department of Commerce.

COMPETITIONS: Entries are being accepted for the **1960 Annual Hess Brothers Versatility in Design and Use Contest** which honors manufacturers, inventors and designers who create products that serve more than one purpose. Awards are made in eight categories: toys and sporting goods, housewares, home furnishings, general products, and new products in any field, women's fashions, men's clothing and accessories, children's clothing and accessories. Information may be had by writing to Hess Brothers Awards Committee, Suite 1019, 527 Madison Avenue, New York 22, N.Y. . . . A drapery design contest, said to be the first offered to art students in colleges and universities, was announced by **Edwin Raphael Company, Inc., Holland, Michigan.** The contest offers $1000 in prizes and is for the best designs submitted in each of two fields: drapery designs for woven textured fabrics, and designs for silk screen printing on draperies. Any design submitted may be bought for commercial use by Raphael. The closing date of the contest is May 1, 1960, and contest information is available from the Raphael Company, Holland, Michigan . . . A contest for designs in lamps and lighting was announced by the **Lamp and Shade Institute of America.** Any student of a school or university in the United States with a curriculum in industrial design or interior design may compete, and prizes will be awarded for those entries which offer the best combination of good design, good lighting, originality and suitability for production, in the opinion of the jury. First prize will be $500 and seven more cash prizes are offered. For entry forms write: The Lamp and Shade Institute of America, 15 East 26th Street, New York 10, N. Y. The closing date of the competition is December 10, 1960 . . . **The National Industrial Design Council** of Ottawa, Canada, which annually offers awards to well-designed products that have been manufactured in Canada, has announced that this year the award program will be reorganized. Only products designed and made in Canada will be considered. However, the date of design and manufacture will no longer be a factor in the judging. Another important change is that the committee will distinguish between craft-based articles for custom production, and industrial designs for mass production . . . **The American Institute of Steel Construction** sponsored a competition for the best design of a steel highway bridge. Entries were to be of a steel bridge to carry a two-lane crossroad over a modern four-lane highway (see above). Winner in the professional classification was Allan M. Beesing, engineer, of Buffalo, N.Y. The first award in the student classification went jointly to Niels Gimsing and Hans Nyvold of Copenhagen, Denmark.

*Quandt*



*Models of two prize-winning bridges in the steel bridge design competition.*

### People

APPOINTED: **Robert Quandt** (left) as product design manager at Corning Glass . . . **Robert Glass** as director of packaging at Publicker Distillers Products, Inc. . . . **James P. Beury III**, and **Lawrence Earl Mayea, Jr.** to Harper, Landell & Associates . . . **Ruth Stein** and **Abraham Leibson** as designers at Peter Quay Yang Associates . . . **Joseph Schmied** as senior design engineer at Fireboard Paper Products Corporation.

ELECTED: **George W. Martin** and **Frank W. Reynolds** as, respectively, president and vice-president of the Society of Plastic Engineers, for 1960.

IN THE NEWS: **Mr. Will Burtin**, who designed the structure of "The Basic Cell" for the Upjohn Company, has been named Special Advisor by the BBC for their forthcoming telecast, "Basis of Life." The program will take place inside "The Basic Cell," a 24-foot structure. Cooperating with Mr. Burtin in the show will be **Dr. Leonard D. Hamilton**, head of the Sloan-Kettering Institute's Isotope Section, and **Mr. Gordon Taylor**, writer and researcher for the BBC's scientific program series (left) . . . Visiting **Cushing and Nevell**, industrial designers, last month, were **Kurt Gall** and **Siegmar Adamowsky** (left), young businessmen of Berlin, who were brought to this country by the International Cooperation Administration to review aspects of American business and industry.

*left to right; Gall, Nevell, Adamowsky*

*left to right; Burtin, Hamilton, Taylor*

# Shape your product future with U.S. Royalite®

ABS THERMOPLASTIC SHEETS

Here is a versatile thermoplastic sheet material that forms to *any* shape in sharp detail – and still answers the basic design problems of toughness, beauty and economy. Used as a tool for advanced thinking, U.S. Royalite makes new, modern product designs practical. Check these advantages: (1) Royalite is extra tough to resist hard knocks and scrapes, is impervious to grease and oil, nonrusting and unaffected by most chemicals. (2) Royalite molds cleanly, without seams or sharp edges to snag or chip. (3) Royalite gives you new textured beauty in a wide range of colors built in to last. (4) Royalite is extra light, making portable products even more portable. (5) Royalite is economical to use. Advanced fabricating techniques permit its wide use on popular-priced items. Send for free, file-size specifications booklet.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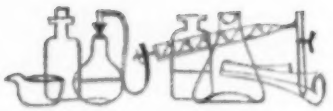
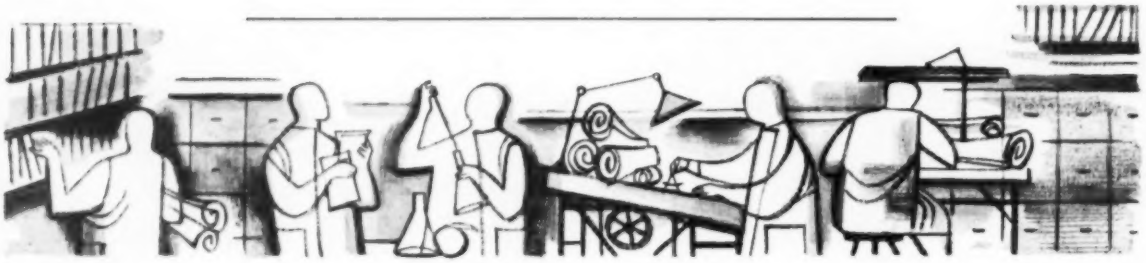


*Hundreds of custom molders of plastics have no research and development facilities . . .*

*Some have one or two men . . .*



*But only one is staffed for every type of plastics research and development . . .*

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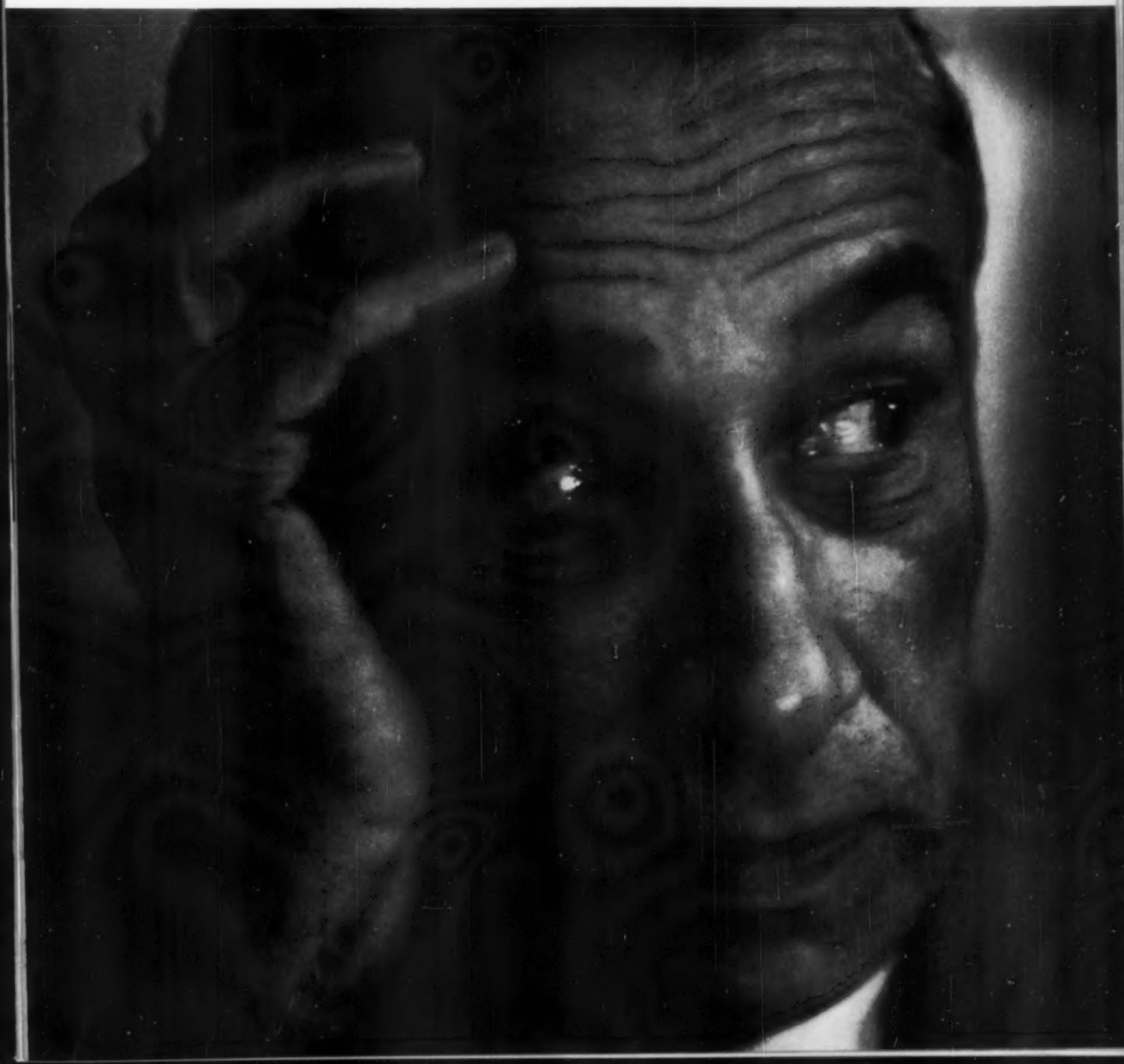
# *"We exist to help our clients lead their markets"*

**THE ALCOA INDUSTRIAL DESIGN AWARD**
Presented to Peter Muller-Munk Associates in recognition of notable achievements in design incorporating imaginative and effective use of aluminum. Deborah Allen, Alfred Auerbach, William Friedman, Ada Louise Huxtable and Arthur Pulos comprise the distinguished jury of critics, editors and educators in the design field which chooses recipients of the award from the Alcoa collection of industrial design.

**With these words, Peter Muller-Munk summarizes the significant contribution of his own famous firm, Peter Muller-Munk Associates, and of the entire industrial design fraternity.**

**In Peter Muller-Munk's philosophy, there is no one-way route from consultant to client for good design. On the contrary, he holds that every sound design demands a team effort involving major contributions from both sides of the table. He scoffs at the notion of conflict between salability and authentic beauty, maintaining that the well-designed product is the best seller nine times out of ten. With an abiding respect for the taste and discrimination of the American people, he has never seen any need for "designing down" to the buying public.**

**Chosen from among the many projects executed for leading manufacturers by Peter Muller-Munk Associates, the design of the new Super Graphic camera makes a story of compelling interest for all management men concerned with broader markets and brighter corporate images.**



**Briefing their staff,** typically a first step in designers procedure, Muller-Munk and partner Anton Parisson stressed three main objectives: simplification, suitability for economical production, and functionalism. Drawing heavily on Graflex research, they checked "human engineering" all the way from typical handholds to the mechanics of shutter tripping. First target for designing skill was the Speed Graphic's wooden frame. Dropped, kicked, stepped on and even used as a bludgeon, its sturdiness was unchallenged. But laboriously dovetailed joints made production costly—a logical objective for remedial work by PMMA.

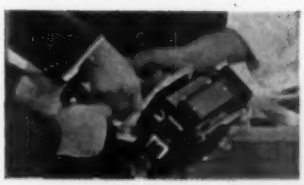
**Answer: aluminum**—specifically, an extruded strip bent to shape and butt welded at the bottom joint. Integral beads on the edges added rigidity and served as trim strips for the leather-grained covering. Fortified by counsel from Sam Fahnestock *(below)*, Alcoa's chief industrial designer, Muller-Munk could cite lightness, strength, easy assembly and space savings gained from thinner sections to win approval from Graflex.

## The designer meets the challenge

Problems are the business of Peter Muller-Munk Associates. They may involve the design of a wholly new product . . . or the redesign of an existing one. They may have their roots in aesthetics, or functionalism, or economics of production—or all three. Each new assignment is a distinct challenge to designing skill and ingenuity.

An example is the problem laid in PMMA's lap by president Gaylord C. Whitaker, of Graflex, Inc., Rochester, N. Y. Instead of complacency born of the fact that Graflex cameras have long been the work horses of press photography, Muller-Munk was faced with a demand for a totally new design. The primary reason was a desire to tap a rich new market among amateur photographers, whose envy of press cameras had been carefully noted. However, Graflex executives had misgivings about the appeal of existing models; festoons of range finders, view finders, light meters, wires and solenoids might not bother professionals, but their probable impression on amateur lensmen gave rise to serious doubts.

Any reservations about the need for starting from scratch had disappeared when the company deemed it desirable to add two new features—a revolving back and a lens board that could tilt, swing, rise and drop to provide greater flexibility in photographic composition. Peter Muller-Munk, looking at the classic but cluttered "box," voiced full agreement. What happened in the 23 months to follow is told here as a typical case history in successful product development.



*"We exist to help our clients lead their markets"*

**Next problem:** total enclosure of the myriad accessories within the frame versus housing within a "penthouse" atop the box. Muller-Munk and his associates held out for the former approach to eliminate clutter, but their client demurred, lest the camera look too big. Countless conferences, common practice as designers probe for suitable answers, led to the development of six "directions"—the profession's word for different approaches. A "boiling-down" process further reduced the number to two.

**In Rochester** *(right)*, partners Muller-Munk and Parisson presented the alternates—one with a wrap-around frame, the other with an auxiliary top housing. But the designers had an ace up their sleeves in skillful use of two-tone styling and strong horizontal lines in the name plate and the strap mountings to minimize camera height. Graflex high command—*(left to right)* engineering director Barry Passman, president Whitaker, sales and advertising chief Bill Taylor, production v.p. Bud Moore—bought the wrap-around version.

**Now, the innards**—with the over-all "direction" established, internal components got undivided attention. Examples: the number of locks, pivots and stops for the front standard was cut from eight to four. Dangling electrical circuits moved inside. Lens board retainers were radically simplified. And because handmade samples were produced as soon as each part was designed, PMMA's Parisson and Graflex model shop foreman, Rolland LeBlanc, saw the new camera grow before their eyes *(below, left)*.

**Manufacturing considerations** bore heavily on design as each ancestral component was revised, but the machinability of aluminum eased the problems. One example was the production of the yoke, under examination here by Parisson, Graflex Chief Engineer Bill Sanderson and Project Engineer Bob Dalton *(above, right)*. It's standard procedure for design consultants to maintain tight liaison with their client's technical staff.

**The payoff** for president Whitaker and designer Muller-Munk—an all-new Super Graphic. With the close teamwork that PMMA counts as paramount, every part except two represents totally new design. Clutter is eliminated, and all accessories are enclosed out of harm's way. Production costs run no higher than for the camera's predecessors, despite the many improvements. Sales response rates as highly gratifying.

**Aluminum is the designer's metal.** Throughout the new Super Graphic, aluminum components enabled Graflex, Inc., to save both weight and production costs at the same time they were fostering sales appeal. Where a light-absorbing black finish was required, anodizing took the place of paint and ended chipping and scratching. You can use this same technique to get almost any color you desire. Aluminum's versatility shows up dramatically in the variety of fabricating techniques Graflex employed. Die castings provided high strength and dimensional accuracy in intricate parts. Stampings saved money through low-cost dies, yet offered excellent finish. Screw machine stock yielded three times as many parts per pound as alternate metals; production rates with free-machining alloys were limited solely by the capacity of the tools. Aluminum extrusions, typified by the Super Graphic frame and yoke, permit the design of complex cross sections that would be prohibitively expensive—or impossible—to produce by any other method.

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## CLIPS AND QUOTES

**Herbert Read,** *"Aspirations in Perspective", The Listener, May 7, 1959.*

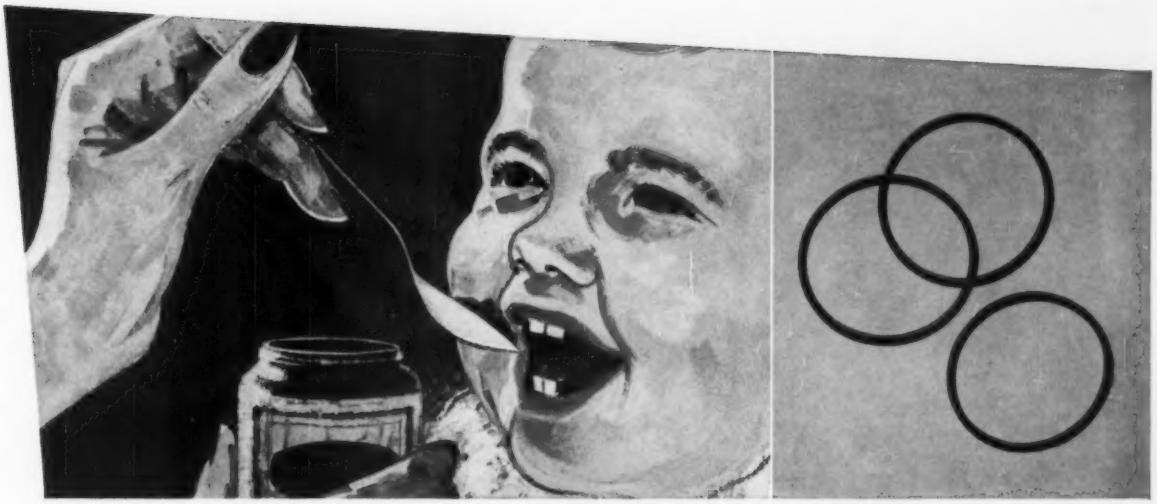
"In 1911 there did seem to be a possibility of integrating art and society—we still lived with the high idealism of William Morris and Peter Kropotkin. But the people drew away from us . . . At the same time another revolution has taken place— a technological revolution—and this revolution has put into the homes and the hands of the inhabitants of the new Welfare State means of entertainment which never existed before. The gramophone and the film, broadcasting, and television now provide the people with all the interest and amusement they have time for. Insidiously, these mass-media of communication, as they are called, have destroyed the whole social basis of personal arts like poetry and painting, and now these arts, if they live at all, live on charity . . . One clings vainly to the hope that out of these new media of mass-communication a new art-form may emerge, but I must confess that as time passes I lose even this last faint hope."

**V. S. Pritchett,** *"Party of One", Holiday, November, 1959.*

"I think the tendency of modern society is to make us think there is a mysterious standard eye or opinion like the standard inch. That very unobjective word *objective* is constantly used. The superstition is natural: we, the offended, are fed on the single view of propaganda, advertising, and myths. If we are subjected to rival propagandas, we have the illusion that there is a third mysterious something somewhere that will decide the issue. We have come to accept only the advertised view of things; if it disappoints us we do not start looking at the things for ourselves, but look for another advertisement."

**William M. Burton,** *"Respectability for Marketing?", Journal of Marketing, October, 1959.*

"There are several indications that marketing will mature socially, and that marketers will devote themselves increasingly to the welfare of others, and will scrutinize more closely the relationship of goods to human satisfaction. One indication is the passing of scarcity—of essentials, conveniences, even comforts. The principle of diminishing returns must apply to the satisfactions to be derived from still more, bigger, more-rapidly-obsoleted goods with more chrome and cellophane . . . Another factor is the growing technical and productive capacity of Russia, which forces reconsideration of superiority based upon quantity of production alone. A third indication . . . is the growing expression of concern by marketers about the social status and obligations of marketing . . . A fourth consideration is the increasing influence of psychology, sociology, and other behavioral sciences upon American marketing theory, methods, and morality."



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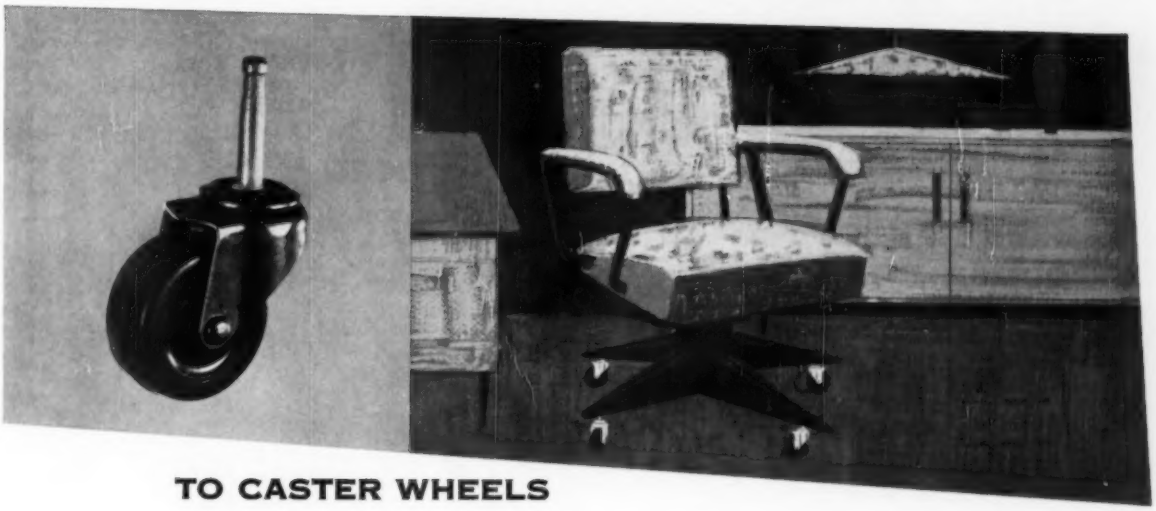

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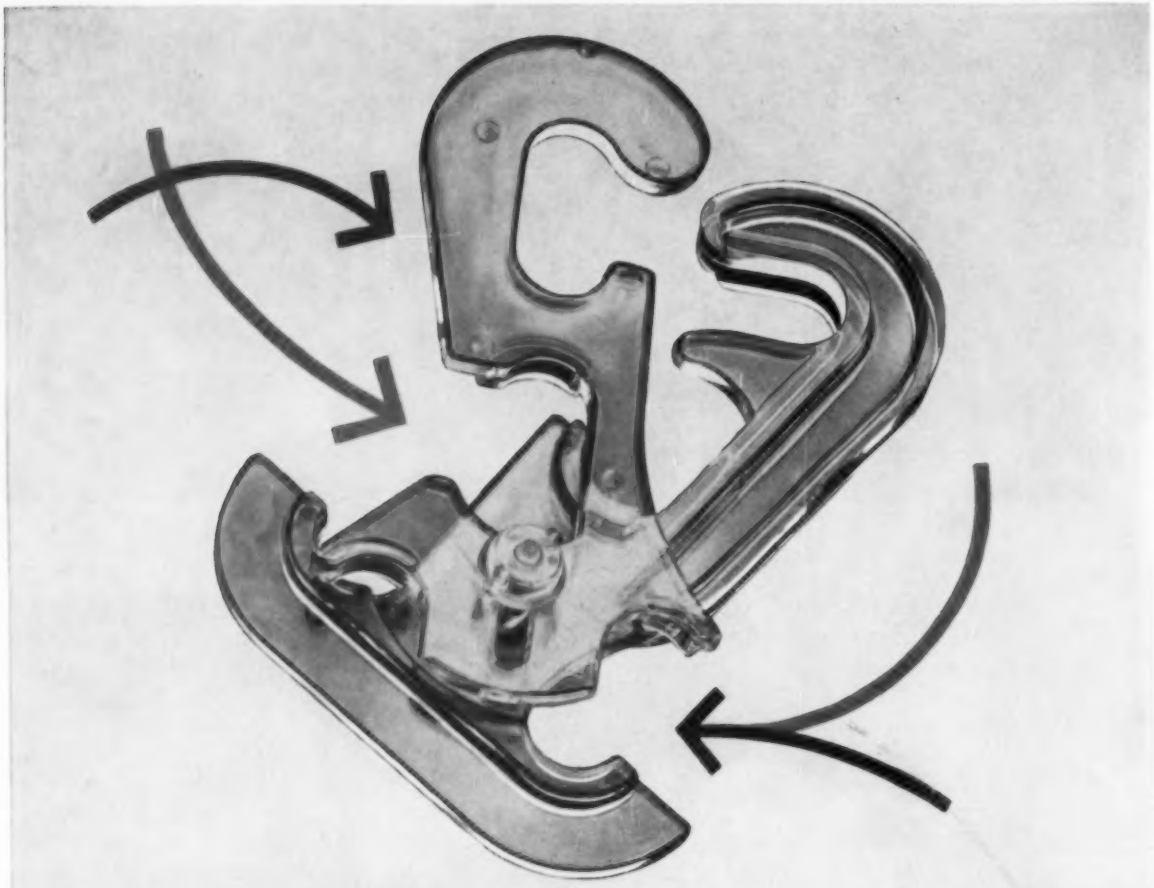

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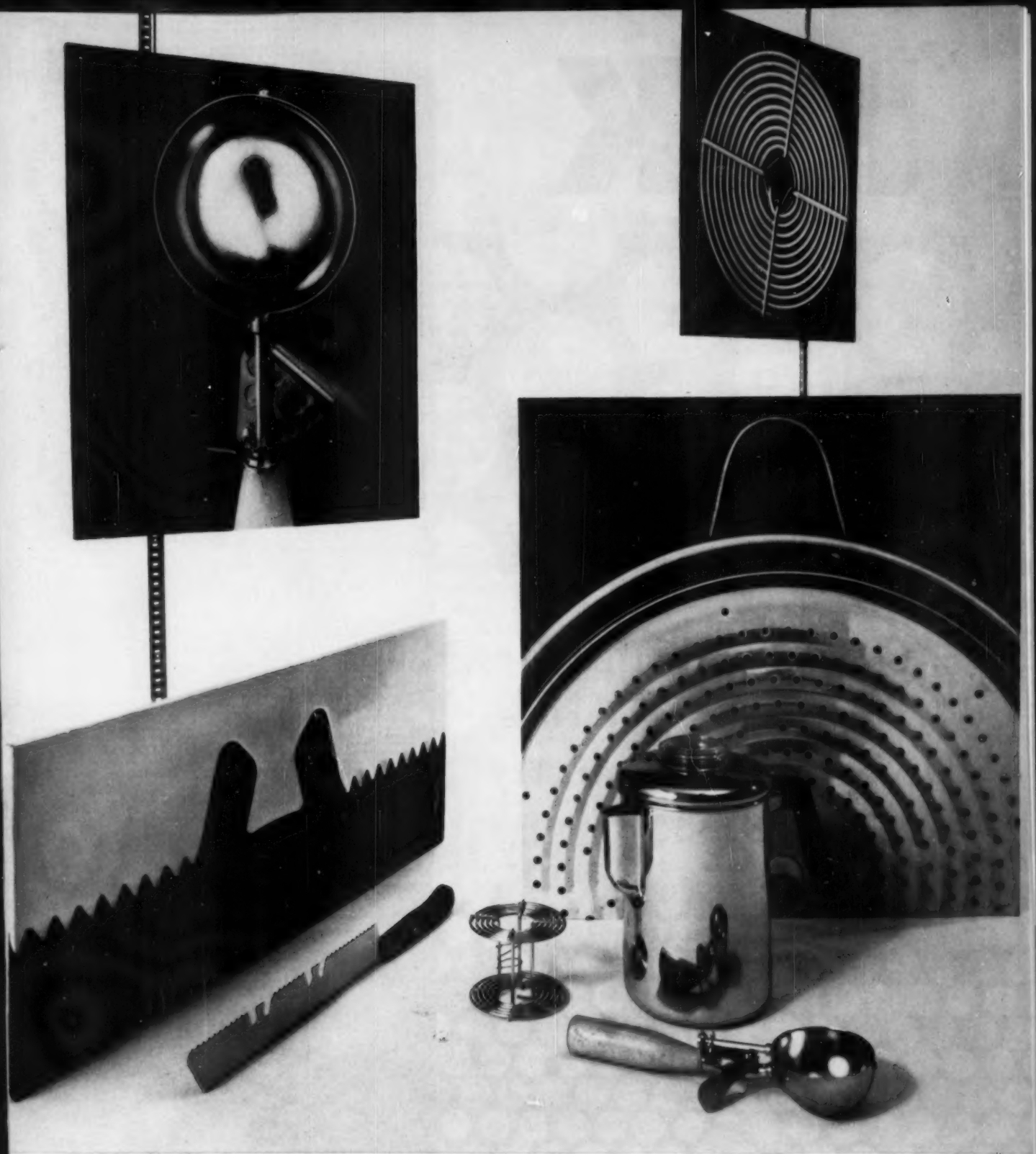

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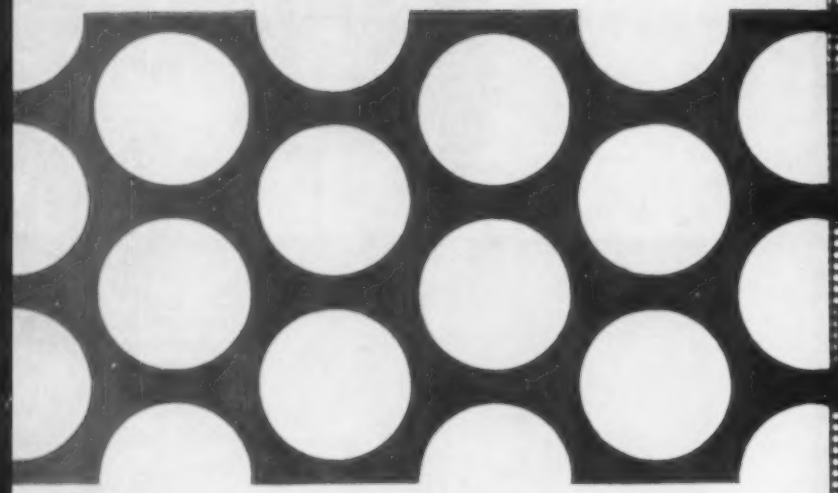

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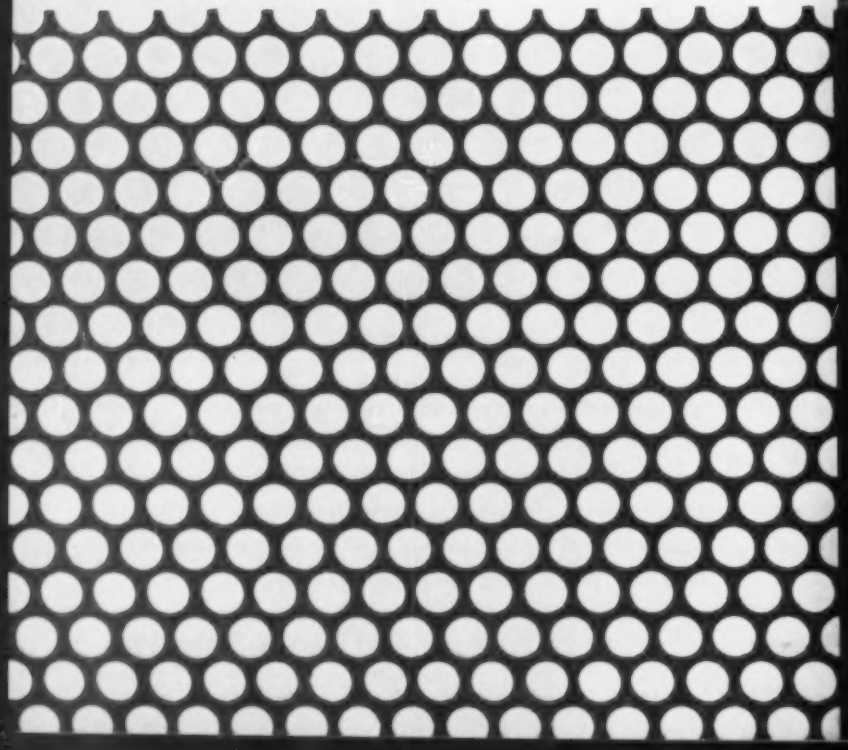

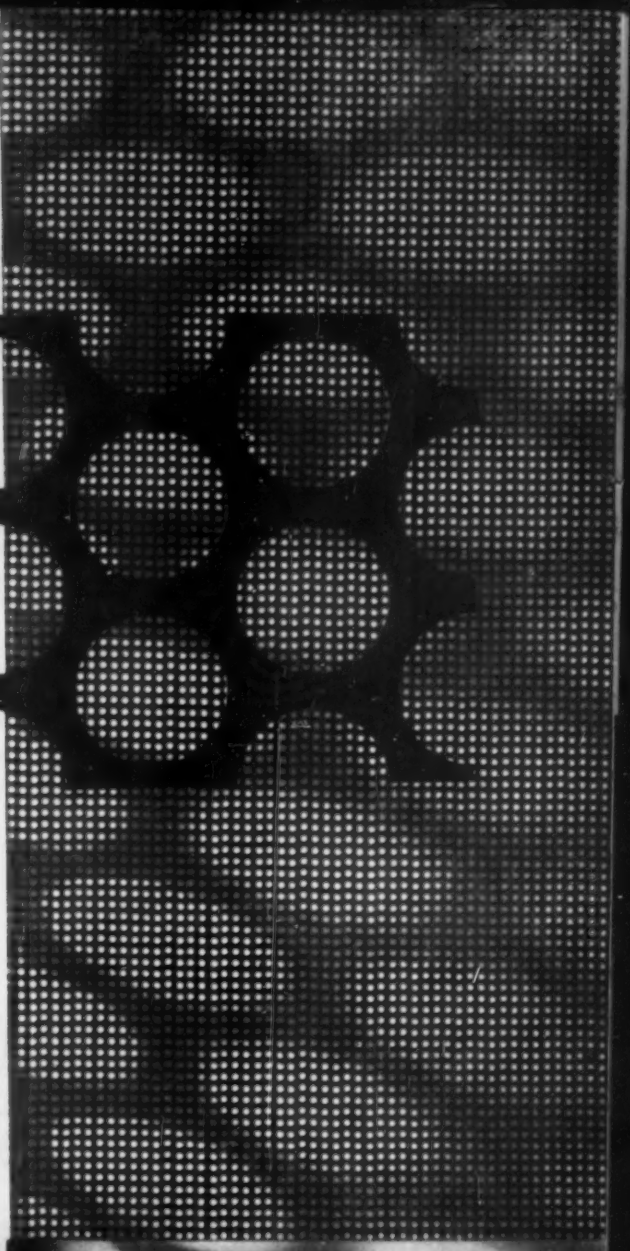

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# Production and the shape of things

An early American anecdote concerns the drugstore cowboy who used to lean against village buildings under the conviction that *he* was holding the building up, instead of vice versa. We are all occasionally given to exaggerated views of our own importance, and the designer is no exception. He may think he has determined the shape of the battery-powered whistling teapot, but the kettle's shape may actually be just one inevitable link in an inevitable chain of production. Too often it is a missing link—when there is no industrial designer on hand, the result may be non-design. But far too often when he *is* on the scene, the result is overdesign. And, although he may castigate himself in professional meetings, the fault may lie not so much in him as in the stars of our peculiar economy.

Here's how the stars look to us in a period of overproduction. The shape of products depends at least as much on a given rate of production as on any other single thing. Much of the current pressure to produce is based less on increased information about the world and its needs than on the increased cost of idle machinery. Idle machines, like idle hands, can become the devil's handmaidens when they are pressed into service to make temporarily appealing "splinter objects" — products that exist only because there are machines to make them; "splinter" because many of them were originally the logical components of other products. Our way with the machine has led precariously close to a situation in which the machine, like the sticks in "The Sorcerer's Apprentice," can have its way with us by inundating us with products for which we have little real use, and therefore no room in our already cluttered lives. (This is bad enough down on the farm, but it will be harder to store surplus transistorized can openers than it is to store surplus wheat. Since the product cannot advertise the fact that its *raison d'être* is often only the need to keep running the machine that makes it, the designer is given the task of making unnecessary products seem necessary. Products that express a false premise are essentially falsely designed products, which is why overproduction breeds overdesign.

Is the designer, then, the victim of overproduction? Not always. For many designers are willing and anxious to play the game, and even advertise themselves as the nimble merchandising chiefs who can create appeal so strong that it compensates for the absence of demand. The designer who does this is well on his way to becoming the "rigged" contestant of industry: he not only takes the shape that overproduction suggests for him, but goes even further by insisting publicly, and of his own volition, that it is the natural shape of things.

The most common defense of production beyond need is that, in the affluent society, it is inevitable. Certainly our economy depends on a high rate of production, but one of the driving principles of industrial design has been the rejection of the evils inherent in this kind of inevitability: the designer was the first to understand that the machine was not *inevitably* a monster, although, admittedly, monstrous use could make it so. Unlike the fine artist, the designer does not ignore economics; his role is to find a decent way of expressing all aspects of mass culture. He is not doing his job if, instead of expressing it, he merely *describes* it in his designs, (and of course he is doing far worse if he falsely describes it.) By responding sensitively to human demands, the designer not only satisfies them but actually changes them, since his designs, not being static descriptions, affect the culture that provokes them into being. The overdesigners, on the other hand, affect nothing. Although they are, inescapably, part of the scene, they are only leaning against buildings held up by forces they may not even be aware of.—*J.S.W.*

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# STREET

## SHALL WE HAVE ASPHALT JUNGLES OR GARDENS OF BEAUTY AND DELIGHT

*by Ann Ferebee*

Now that the parking meter has replaced the hitching post and the gas pump the watering trough, the transformation to the modern street might seem to be complete. But although cities invest millions of dollars in complex furnishings, few will argue that the street looks better for it. The melange of street furniture opposite—drawn from random cities across the country—makes the point to anyone interested in a handsome and harmonious streetscape.

How can the shapes, sizes, styles and colors of such disparate objects be coordinated? And, *should* they be coordinated? An editorial in the *New York Herald Tribune* warns that New York City now has at least 64 different types of street lights—82 if minor variations are counted—and ends with the suggestion that "surely somebody with inclinations both practical and artistic ought to be able to cast some light on the problem." Apart from such vexing variety, the actual quantity of equipment is prodigious. It has been rising steadily over the last 200 years, with few agencies responsibly considering the relationship of the items to each other or to the street as a whole. Even when an individual design is successful, it may fail to fit into its environment properly. Certainly the automobile has been the most significant factor in altering the appearance of the city street; (in fact, by increasing speed of transportation, it has altered the very relationship between man and street.) Furthermore visual homogeneity in the city has generally been sacrificed to the needs of traffic. Because mounting traffic is virtually squeezing the pedestrian off the streets, many cities are closing their main avenues to all motorized traffic in order to create a haven for the pedestrian (and retain the vitality of the city's core). Just last month, Kalamazoo, Michigan, closed its busiest street, making it the 55th city in the country to try this plan. Where traffic engineers have worked to fit the automobile more comfortably into the pattern of city life, they have frequently at the same time removed all variety of character and mood from the streetscape. For this, however, the engineers are not completely to blame. Until recently most furniture for the street was cast in iron; the new furniture is made of steel and aluminum. Until designers create a rich and flexible vocabulary for these materials as they once did for cast iron (see frontispiece for examples), street furniture will continue to suffer from esthetic anemia, look monotonous.

These difficult problems are making the subject of street furniture increasingly fashionable in design circles (the discovery that the most prosaic fire plug becomes bizarre when the camera isolates it now makes street furniture a hit with the mass-circulation magazines, too). But few give much attention to how street furniture got there in the first place, and, now that it is there, what, if anything, can be done about it. On the following spread we make a modest proposal for opening one road to better street furniture design. Evidence that well-designed streets and street furniture do exist follows (on page 44) in a catalog of equipment from the private streets of the housing project, the campus, and most dramatically, the shopping center. Here designers and architects have rejected the street furniture of the city to make their own, to create designs which are contemporary, handsome and *planned* to harmonize with other elements and with the surrounding buildings. These private streets set a design standard which those responsible for the public streets of American cities might consider.

## For the Public Street: a modest proposal to upgrade street furniture in American cities

*"The complexity, hurry and frantic improvisation of the modern way of life seem to have petrified in its street furniture."*
*Kenneth Browne,* Architectural Review

An innovation from an unexpected quarter—the American tobacco industry—last year brought an innovation in New York's street furniture—a public ash tray (page 40). Although New Yorkers have always been heavy smokers, it was not until the mass marketing of filter tips that cigarettes became a major litter problem to their Sanitation Department. Because the new cigarettes wouldn't disintegrate as rapidly as the old tipless variety, they were clogging the city's gutters at an alarming rate. Tackling the problem himself, Sanitation Commissioner Paul R. Screvane sketched out ideas for a public ash tray to collect the residue of some of the 52,000,000 cigarettes purchased daily in the city. Since their installation, the department reports a 60 to 80 per cent decrease in cigarette litter in the areas where the $18.50 ash trays have been placed. This is enough to make the city happy with its new piece of furniture, but designers might have some questions: Couldn't it have been produced more economically? Couldn't a more attractive form that would harmonize with other elements in the street have been used? Why not have a model that would be easy to empty (sieves must be used to sift out butts on the present model)? In the case of the commission's canine comfort station (page 36) no one was happy, least of all the dogs. In spite of the geraniums, it was not sufficiently popular with New York's canine population (270,000 licensed) to justify duplicating the design throughout the city.

There is nothing unusual in the commissioner's approach to design; it is fairly typical of the design-by-happenstance city government way of working that is current across the country. This is important, since city governments exercise by far the greatest control over public street furniture. The city not only says what shall go where, and then pays for it; it sometimes, as in these cases, goes right ahead and designs. This may mean that the city government must take the first step to clear up what is essentially a problem in civic design.

### Supplier design vs. designer design

Although a department commissioner or some other department member may work up the design for a new piece of street equipment, most often it is purchased ready-made from suppliers. The supplier himself is apt not to place too much emphasis on design and the city's representative understandably considers economy and efficiency his first responsibility. Frequently, as with New York's new Third Avenue lights (whose standard was designed by engineers in the Department of Water Supply, Gas and Electricity, and whose light fixture was designed by Westinghouse), major components of a single item will be made by two different manufacturers. Even when an individual design is good, its combination with other items on the street often creates visual anarchy.

There have always been interesting exceptions to the design-by-supplier rule. When Hector Guimard designed the entrances for the Paris Metro he created a memorable example of Art Nouveau and probably the only piece of subway equipment that will ever have a place of honor in the backyard of New York's Museum of Modern Art. Fifth Avenue's distinguished street lamps (patent sketch on front cover) were designed by the founder of *Publishers Weekly,* Richard Rogers Bowker, who at the time was also an executive vice president of the Edison Electric Illuminating Company. These famous old lamps were first installed in 1892, the year of the World's Columbian Exposition in Chicago, the year the Columbus monument went into place at Columbus Circle (surrounded by special boat-bedecked lamps), and the year Stanford White finished his arch at Washington Square. Bowker also directed the evolution of the familiar bishop's crook lamp (frontispiece) a reverse scroll bracket post, a mast arm post, and a lyre top post, all related by an acanthus leaf motif and a bay leaf torus base. Most recently the department of Walter Supply, Gas and Electricity, which now has jurisdiction over New York's street lights, has retained Donald Deskey Associates to design a new street lamp (right) for the city. Still in the experimental stage, the new design, when approved, will replace 64,000 cast-iron posts, including many of the old Bowker designs, with a slotted aluminum multi-purpose post. The slotted standard will hold police and fire call boxes, street signs and traffic lights; its final extension will hold a mercury vapor lamp. It will provide up to 250 per cent more illumination at an energy cost 33 per cent below the present one. But in spite of these obvious advantages, many—including admirers of the art of iron casting as well as rank sentimentalists—are mourning at the thought of losing their old posts and asking for something "with a bit more design" in the new models.

### A designer for the public street

Despite such exceptions, most public street furniture is designed by the supplier or by city engineers and mechanics. As a consequence, even on the most cared-for streets, such as New York's well-groomed Fifth Avenue (page 40), the design of most equipment furnished by city governments is depressing. Is this situation inevitable? Or would it be possible for the city to retain an industrial design firm to coordinate the various pieces of city-owned equipment, and to contribute to the design of all new pieces of furniture as they are needed? Designers who have worked with the New York City government on other projects estimate that the cost for even the nation's largest city would be modest—running between $5,000 and $10,000 in a year when no new designs are required and up to $30,000 or $40,000 in years when a new design is called for. (As the Bowker lamps prove, most street furniture is remarkably long-lived. When cities

develop a design they find suitable, they are apt to stick with it until some one makes a radical innovation or until it is hopelessly out of style. Many of New York's park benches, for example, are of 1935 vintage and its basic mesh trash can (page 36) was introduced around 1920.) Such a program would not require an immediate upheaval in the city's departments, but over a ten to twenty year period it could lead to a radical and permanent improvement in the design of public street furniture and in the appearance of the street as a whole. Such a program would in some cases require an alteration in city law; certainly it will require a change in the "it's not important and it won't work" attitude many city officials adopt toward better street furniture design. At least, city governments could now work toward establishing a coordinated design policy, insuring that each piece of furniture will be well designed yet share a common style with other items in the street.

### The British program

Great Britain's remarkable program for public street furniture design indicates that the idea for such a plan in America is not completely blue-sky. Impetus for the British program had its roots in the stark situation facing the nation at the close of World War II when whole cities had to be rebuilt and new ones planned. At this time the Council of Royal Fine Art Commissions for England and Scotland assumed responsibility for examining the designs of lighting columns on behalf of the national Ministry of Transport. What put teeth in the program was the Ministry's agreement not to contribute towards the cost of a local government's lighting installation unless designs first passed the Commissions. In 1951 the Council of Industrial Design extended the program by assuming responsibility for advising manufacturers on the design of their lamps. They also began keeping a record of approved designs, and the following year set up a Street Furniture Committee—including such distinguished members as Sir Gordon Russell, director of the Council of Industrial Design and J. M. Richards, editor of *Architectural Review*—to examine designs submitted by manufacturers. Now the Council has approved hundreds of designs which qualify them for support by the Ministry of Transport. Discussing the program in its September, 1954 issue, the British magazine *Design* called it a "typically democratic instrument for solving a national problem, steering clear of sanctions, controls, centralization and standardization, but offering incentives to those authorities who aim to do better next time and commercial rewards to those manufacturers who improve their designs."

The United States has no body similar to the Council of Industrial Design, but American cities could retain independent design firms to perform this service. In the meantime, the British experiment does show that public street furniture can be thoughtfully and responsibly handled.

*The Deskey street lamp for New York will incorporate police, fire and traffic-control equipment in its slotted aluminum standard. Extending from the top of the standard will be a mercury vapor lamp which will give 10,000 hours of lighting compared with 2,000 for the present lamps. Cost of the design program was $18,000, which covers design and research.*

**WHO SELECTS THE STREET FURNITURE FOR FIFTH AVENUE?**

**PUBLIC AGENCIES**

## PRIVATE AGENCIES

Like most American cities, New York has no central bureau to coordinate the multifarious furnishings of its public streets. On Fifth Avenue, called by some the most beautiful avenue in the world, no fewer than eight public and four private agencies are responsible for providing various items.

The most ubiquitous fixture on Fifth Avenue, its Bowker street lamps, are now under the jurisdiction of the department of Water Supply, Gas, and Electricity. But a much greater variety of equipment is put on the avenue by the Johnny-come-lately Traffic Department, established in 1949. Though its engineers have improved visibility of signals and designed new ones, they have not been much concerned with the appearance of this equipment or its visual effect on the street. In fact, only the Municipal Art Commission, which meets twice a month to pass on the "appropriateness" of all city-controlled street furniture does anything at all in this direction, and its power is limited; it has no authority to initiate changes or commission designs.

The problem of the furnishing litter on Fifth Avenue, as with most public streets, is due more to division of powers than to lack of interest. Both within and outside the city government are agencies which spend thousands each year to "beautify" it. One of the most successful of these programs is the Department of Commerce-sponsored, privately supported "Salute to the Seasons." Launched in October, 1957, it provides massed flower plantings along some of the major midtown thoroughfares, floodlighting of some of the great public buildings and monuments, and the flying of banners at various times. The handsome cast stone planters (left), whose shrubs and flowers are changed regularly by the Department of Parks, are already on their way to becoming a popular city institution, and stand as an impressive example of a successful combination of public and private effort. On Fifth it is the Equitable Life Assurance Society which donated $25,000 for the program. Along Park Avenue Uris Brothers, a construction firm, has donated $40,000 for the lighting and initial plantings of three blocks of the central mall, and Tishman Brothers, realtors, has donated $30,000 to light some of the streets up in Central Park (the architectural firm of Fordyce and Hamby recently completed this assignment).

Probably the most powerful and consistently effective private group working to improve the avenue's appearance is the Fifth Avenue Association, which spreads its influence over Madison and Park Avenues too. Because of the Association's work, Fifth Avenue is free of commercial traffic, flashing neon signs, gaudy displays, and open-front stores. It is also free of panhandlers, parking lots and store front barkers. In a time of monotonously standardized street furniture, glamorous Fifth now rates its own gold-painted litter baskets (in honor of the Association's fiftieth year), and special bronze, Hermes-topped traffic lights (originally cast in the Tiffany Studios). To keep Hermes, the Association agreed last year to assume responsibility for maintaining the lights, because the city wanted to do away with the extra cleaning chore involved. The idea of the Association has now been adopted in cities from Baltimore and Boston to Paris, London, Auckland and Nagoya. But even elegant Fifth will never have a completely harmonious system of furnishings until a single city agent is authorized to make it that way.

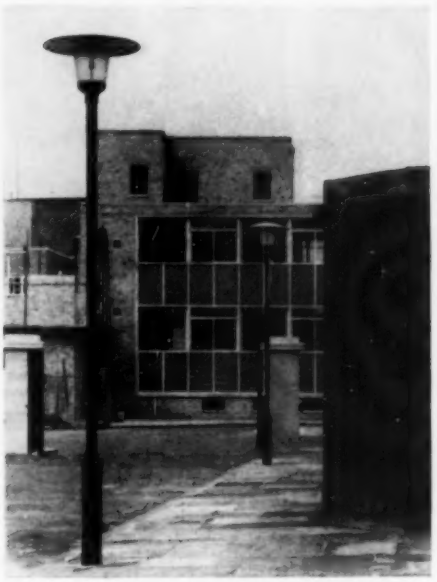
**EUROPE'S VARIED AND IMAGINATIVE NEW PUBLIC STREET LIGHTS SHOW CAREFUL DETAILING AND COORDINATED DESIGN**

**Sweden**

Bengt Carlen

*Post top fluorescent lantern with polyester canopy and acrylic plastic bowl. Designed by Per Heribertson.*

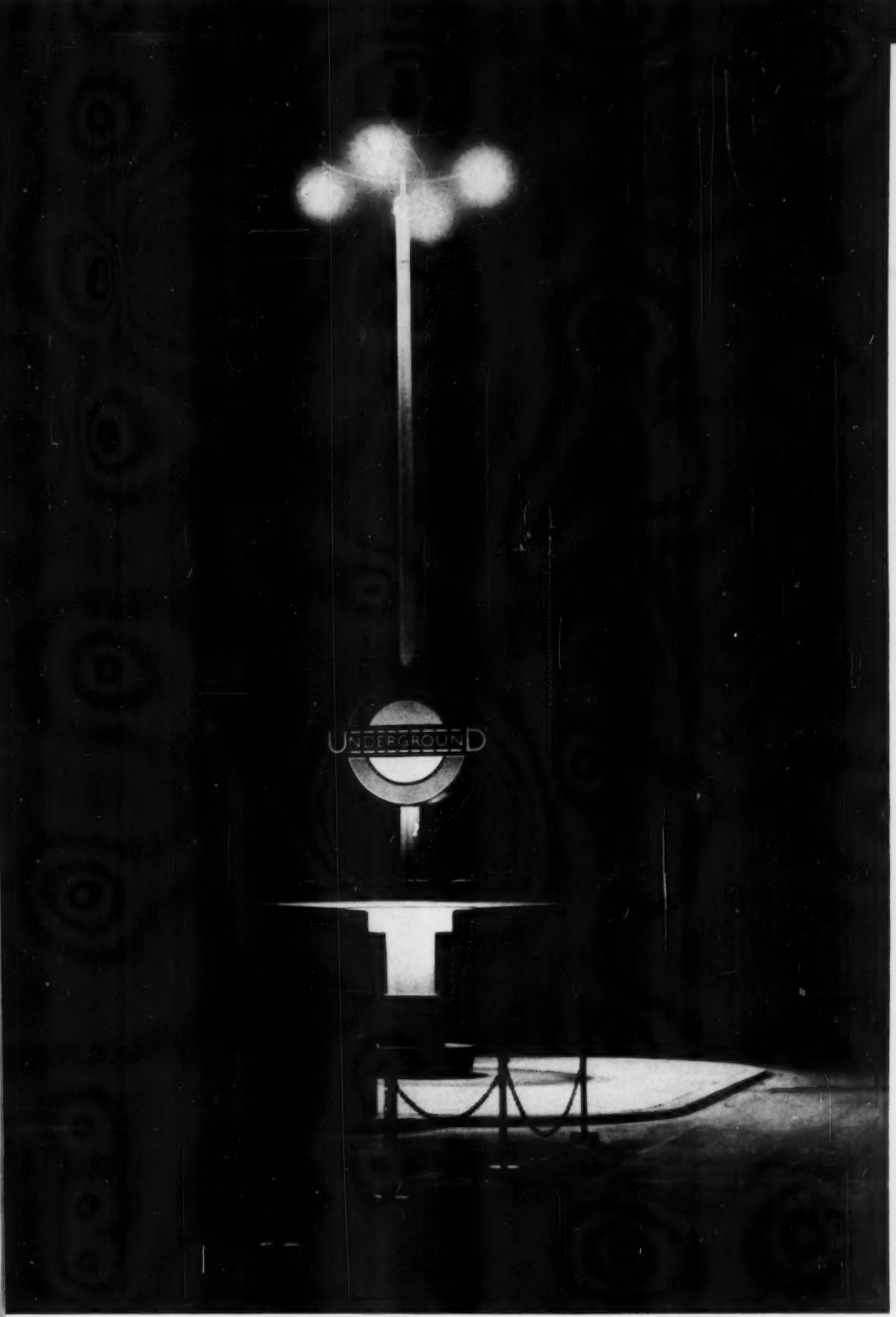
**England**



*All welded tubular steel light, enamel finish. D.R. Mellor for Abacus Engineering Ltd.*

*Twin arm fluorescent light. Richard Stevens and L.C.C. Architects' Department for Atlas Lighting Ltd.*

*Reinforced spun concrete standard, galvanized bracket. Jack Howe, AEI Lamp & Lighting.*




*Combined light, station sign, shelter, and bench for the London Transport Executive. Adams, Holden & Pearson.*

## FOR THE PRIVATE STREET: DESIGNED FURNITURE INTEGRATED WITH ITS SETTING

The collection of street furniture on the following pages comes from the new private streets of the housing development, the shopping center, the airport—even from the temporary streets of the exposition. Among other things, it shows that contemporary street furniture *can* be various and imaginative—occasionally even beautiful—and that it can add significant character to its setting.

What distinguishes this work from that of the preceding section is that almost all of it was created by architects and designers retained by planners who found the available selection inadequate to their needs. Victor Gruen, probably the best known of these men, stands out in our selection simply because, as one of the leading designers of shopping centers, he has become a significant innovator in street furniture too. I. M. Pei & Associates, whose Roosevelt Field has already become a "classic" in shopping centers, has brought an almost "classic" beauty to such normally prosaic objects as benches and ash trays. One important figure in contemporary street furniture design has actually designed nothing at all: James Scheuer, a sort of Olivetti of the urban project, has made a national reputation through his housing developments (his Sacramento project won a major architectural award last year). What makes him significant in the present context is that he has retained such designers as Leo Lionni (page 50) and Saul Bass to create special furniture for his developments.

Besides individuals, several phenomena have had, and will continue to have, an important part in bringing new street furniture designs into existence. Most important are the great international expositions. The last Triennale, the Brussels Fair, the Festival of Britain, all made street furniture an important element in their total design. Much of this would never be satisfactory for the public street (either too expensive to fabricate, or not sufficiently sturdy), but some of the imagination that went into it could well be put to use in solving problems of public street furniture. Whole new cities, like Brazilia, and new city centers, like Lincoln Square in New York, can also be expected to make contributions in this area.

On this spread current designs in lighting begin a catalog that runs from benches, kiosks and trash cans to "street sculpture," where design becomes art and perhaps points the way to an ultimate in streetscape.

*Floodlights along observation deck of Arrival Building, New York International Airport. Harrison and Abramovitz.*

Port of New York Authority


Albert Rothschild Studios

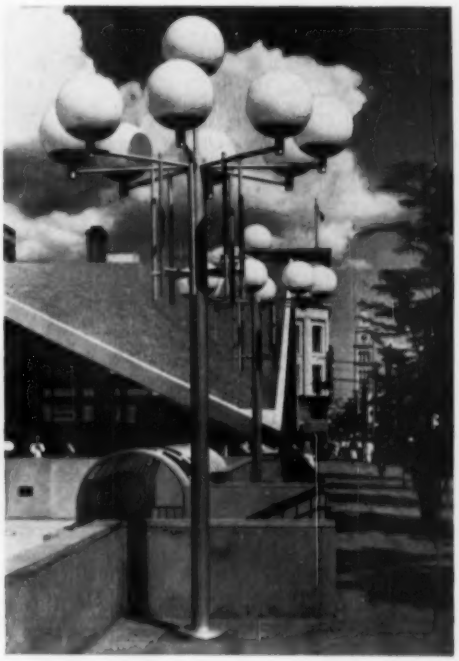
*Lights at Roosevelt Field. Skidmore, Owings & Merrill. Pfaff & Kendall manufacturers.*

Alexandre Georges

*Light for Eastland Shopping Center, Harper Woods, Mich. Victor Gruen Assoc.*

Ostergaard

*Lights at Washington Square Village, New York by Paul Lester Wiener and Sasaki Walker Associates.*



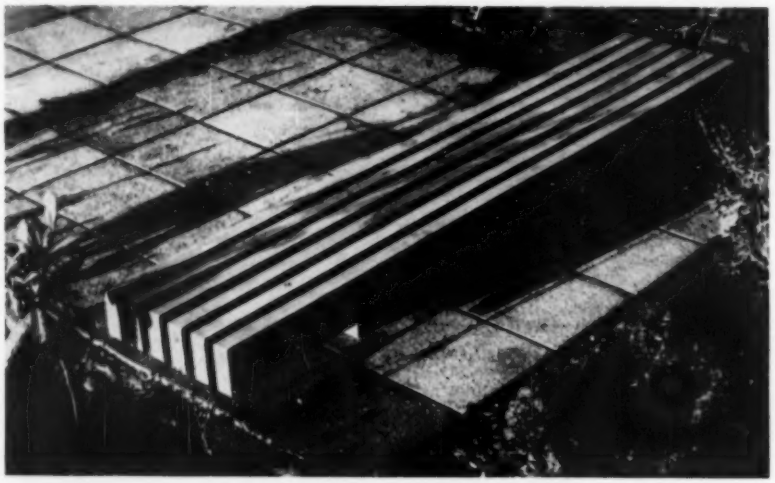
*Opal-glass lamp at Zeckendorf Plaza, Denver. I. M. Pei & Associates.*

Wood, concrete, mable, tile, and wicker have all been used to create a variety of rich effects in the benches and fountains here. The fanciful wicker furniture (right) from the German pavilion at the Brussels Fair probably could not be used in a permanent installation. But there is no reason why some whimsy—fabricated in more lasting materials—should not be put into the public streets. The Spanish architect Antonio Gaudi did exactly that in the serpentine benches which he created for Barcelona's Park Güell. Beatrice Eytan's wooden bench (below) is a detail from a large piazza envisioned as the "living room" of an Israeli village. For eight months of the year the site serves equally with indoor spaces as part of a family care center, without adding prohibitive costs. Eventually, branching evergreen trees will provide a canopy for this outdoor living room. This, and the other elements on the page, add amenities to areas which might otherwise be uninviting.

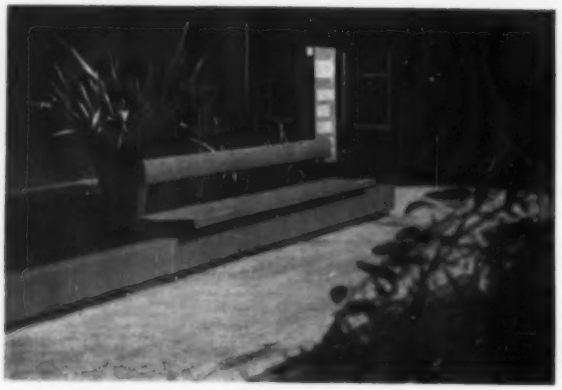
de Burgh Galwey

*Simple wooden benches were provided by Dutch at the Brussels Exposition.*

**BENCHES OF VARIOUS MATERIALS CONTRIBUTE TO SPECIAL CHARACTER OF THEIR SURROUNDINGS**

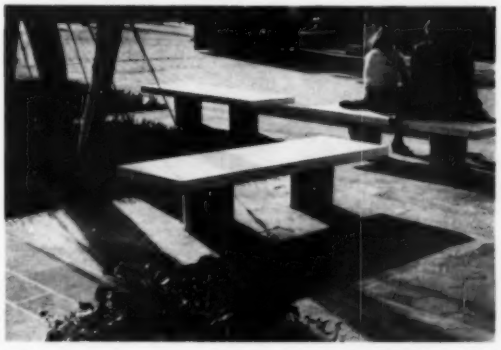


*Bench for Kiryat Yovel community care center near Jerusalem will one day be shaded by young trees. Beatrice L. Eytan for Robert Zion, Harold Breen, Site Planners.*



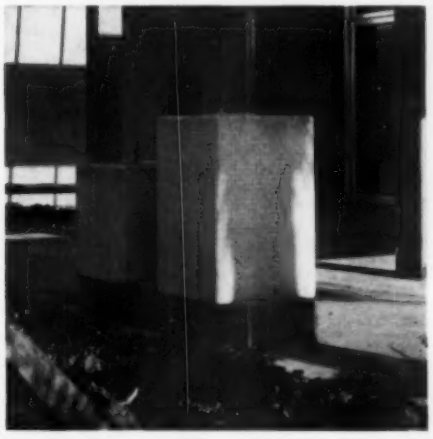
*Benches integrated with plantings create garden setting at Bayfair Shopping Center, San Leandro, California. Victor Gruen Associates.*

*White concrete planters and fountain, stone benches and trees are pleasant details at Roosevelt Field Shopping Center, Long Island. I. M. Pei & Assoc.*

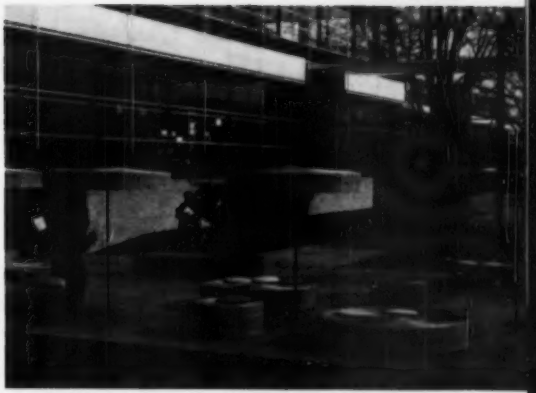


Ezra Stoller

*Grey-blue tile of columns blends with deep blue tile drinking fountain for bank at Yucaipa, Cal. Victor Gruen Assoc.*



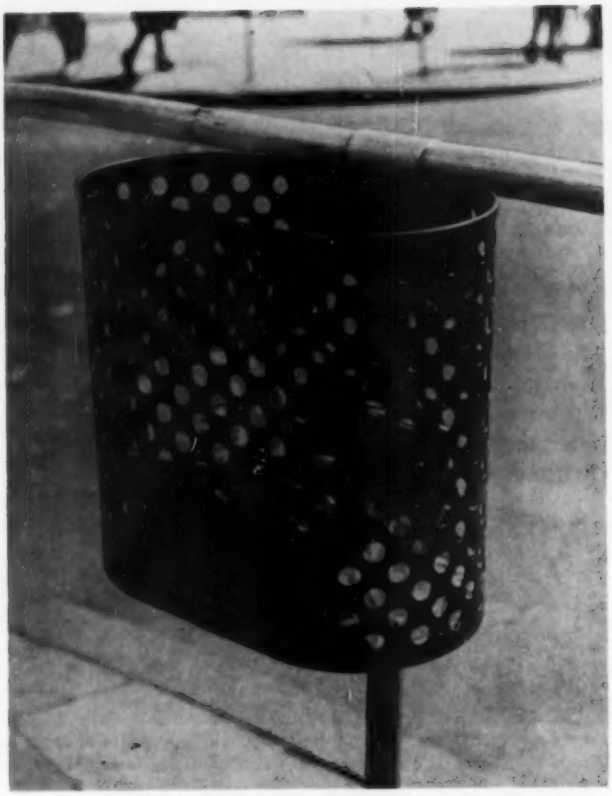
Gordon Sommers



de Bruch Gabler

*Charming wicker furniture was used in German pavilion at Brussels Fair.*

**DESIGN BRINGS BEAUTY TO AN ASH TRAY, CONVENIENCE TO KIOSKS**



Stasharkitekten, Copenhagen

*Perforations form decorative pattern in litter basket from Denmark.*


Council of Industrial Design

*Colorful cigarette bin was designed for Festival of Britain by James Cubitt and Partners.*

Rapid Grip and Batten Ltd.

*Unobtrusive steel basket is by General Steel Wares, Toronto.*

Ezra Stoller

*Sculptured ash tray blends perfectly with travertine bench at Mile High Center, Denver. I. M. Pei & Associates, architects.*

de Burgh Galwey

*Wicker basket matches other furniture (page 47) at German pavilion at Brussels.*

The humble trash can is an object that has not often been enhanced by the designer's skill, and it is refreshing to discover that a start has at last been made. A trash receptacle from Denmark shows that the simplest sheet metal design can be made attractive, yet remain practical, simply by having a pattern of holes punched into it. Even the utterly utilitarian Canadian example has the virtue of being unblemished with either graphics or blatant ads. Unexpectedly, the equally neglected ash tray (in this case I. M. Pei's) turns out to be among the handsomest items in our collection. Kiosks are much more common in Europe than in America, and both the French and British models shown here are excellent ideas: the self service "post office" eliminates time consuming trips to the post office, and the modular British bus stop may be enlarged with ease. Longwood Village's practical telephone kiosk, like the kiosk and light for the British Underground (page 43), incorporates several functions in a single attractive unit.


Courtesy: France Actuelle

*Automatic "post office" provides mailbox, money-changer, money orders, stamps, phone. French Ministry of Post, Telegraph, Telephone has installed them across nation.*

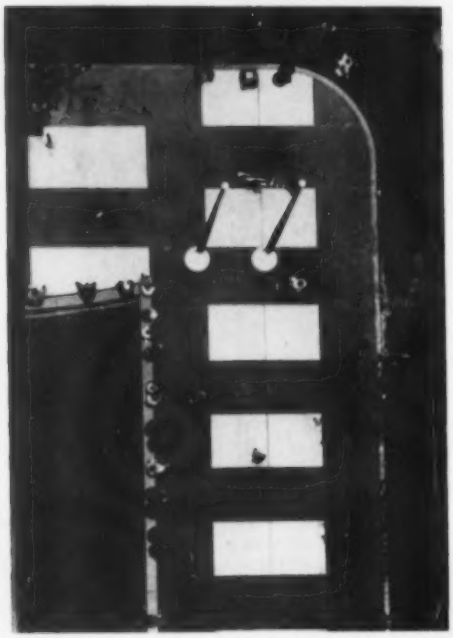
Baltazar Korab

*Steel and aluminum panels are used to build shelters of varying lengths. D.D. Mellor for Abacus Engineering Ltd., England.*

*S-shaped phone booth from Longwood Village in Cleveland has bench on opposite side. Mayer, Whittlesey & Glass.*

**SPECIAL TREATMENT CAN MAKE THE STREET A PLACE OF GENUINE EXCITEMENT AND PLEASURE**

The five designs on this spread represent five ways of bringing added excitement to the street. There is nothing new about most of them—some of the most beautiful decorative pavements were created by the Pompeians 2,000 years ago, and sculpture in the street is almost as old as the street itself. But, until quite recently, both art and decoration have been missing from the modern street. Now Harrison and Abramovitz have created decorative pavements for the new Corning Glass building in New York, and will continue the idea in a serpentine pavement pattern of alternating gray and white stripes for the Time-Life building now under construction. Stahly's decorative pylon is something more than a standard, perhaps a little less than sculpture. At its best, as here, this kind of work adds tremendous visual vitality to the street. The parking lot—one of the dreariest aspects of the urban scene—is a more attractive place for Victor Gruen's treatment of directional standards. Besides amusing, these animals make an excellent mnemonic device, far easier to remember than letters and numbers.



*Decorative pavement for Corning Glass building, New York. Harrison and Abramovitz.*

Balthar Korab

*Exedra by Mayer, Whittlesey & Glass, and clock tower, fountain, and phone stall by Leo Lionni for Longwood Village, Cleveland.*

Henri Glaeser

*Decorative aluminum tower was designed by F. Stahly for Salon des Arts Menagers.*


*Directional standard, Southdale Shopping Center, Minneapolis. Victor Gruen Assoc.*

*Last year when designer-sculptor Constantine Nivola startled and pleased the citizens of his home-town Orani in Sardinia with a street exhibition of his work, it made design news across the world. This was because Nivola's show was really an exciting liberation of sculpture from the studio. As such, it was also the first move toward an ultimate collaboration of designer, sculptor and architect to create a new kind of street in which buildings, furniture and art will at last be in harmony.*

*At RCA's Electronic Data-Processing headquarters at Cherry Hill, N. J. the new system is used to check out customer programs.*

# COMPUTER TAKES ON COLOR FOR MARKET APPEAL

*Into an already impressive array of large-capacity computers steps a newcomer—smaller and cooler—that can handle clerical tedium with a minimum of worries. The new system is colored to blend with and enhance office environments.*

With the new 501 Electronic Data Processing System—a fully-transistorized system which literally brings full color to the computer field—the Radio Corporation of America has entered the battle for a major spot in the computer market. The emergence of the new computer, and handsomely re-appointed electronic data processing headquarters in Cherry Hill, New Jersey, are RCA's all-out venture into a product field which may be the most fantastic in all industrial history. It is a market in which prices are astronomical, product output is low, and prestige for its leaders is enormous. Even for a company famous for its lofty place in certain product areas, moving in on such a market territory was not without its problems. The computer field has been firmly in the hands of other giants (IBM, Remington Rand, Burroughs) and there were and are other companies (Minneapolis-Honeywell, Philco, General Electric, to name a few) risking huge dollar outlays in the scramble for computer leadership. But as a latecomer, RCA had some definite advantages—and it used them to make its real debut in the computer field with strength and colorful fanfare. (The BIZMAC, RCA's earlier computer, was a huge, clumsy affair whose circuits were stuffed into left-over transmission equipment, and behind which the company had—wisely—put little market push).

In designing the circuitry for the new system, RCA engineers were in the position of being able to employ the most advanced electronic components. When the giant computer manufacturers set up their production systems a few years ago for the then-existing range of electronic components, it was not wholly clear that smaller, less troublesome computers could be built entirely with pin-sized, solid-state devices for message-handling and transfer. Today such computers are possible and newcomers in the field can set up shop using the most advanced parts and methods without the burden of drastic revisions in equipment. This is the position in which RCA found itself.

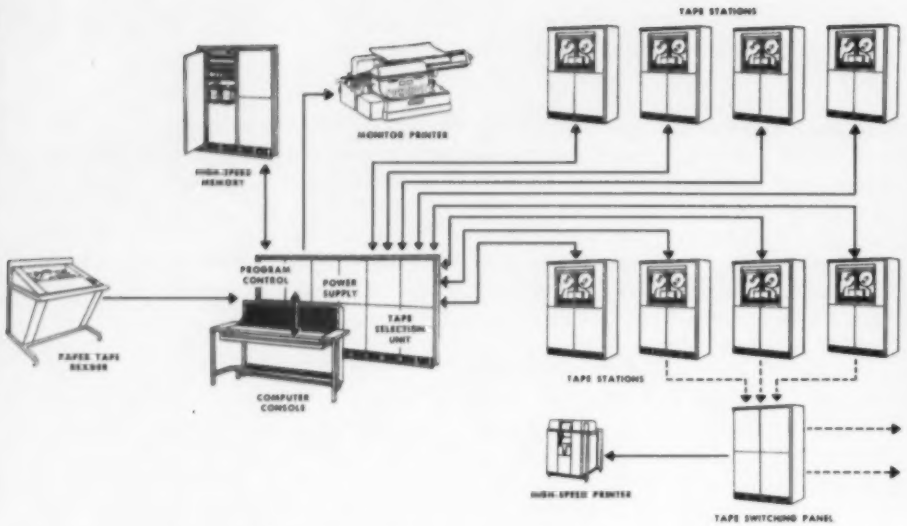
The new E(lectronic) D(ata) P(rocessing) system is capable of performance in the large computer range but, since it uses only solid-state devices, is considerably smaller than its equivalents among "first generation" computers. It is easier to handle, less trouble to maintain, cheaper to rent ($12,000 per month) and takes up a good deal less office space—characteristics which are, naturally, pretty good market assets. But RCA went further than simply exploiting its assets as a beginner. To get as firm a hold as possible on the awesome new market, the new product had to make a strong, clear impression. Like any new product it needed an impact that would at once identify it.

The new EDP system is a product of RCA's Industrial Product Division. Attached to this division is a department of functional design headed by Stewart Pike. This department has in the past taken part in the design of new industrial products (tv cameras, meters, laboratory equipment, etc.) and with John Vassos as design consultant, has worked closely with the company's electronic data processing division from the very start of the division's expansion program. The design team was one of the company departments responsible for the new EDP equipment, whose pronounced feature is the extensive use of color. This above all identifies the system as RCA's though there are other design features (to be discussed later) which differ markedly from design solutions arrived at by competitors.

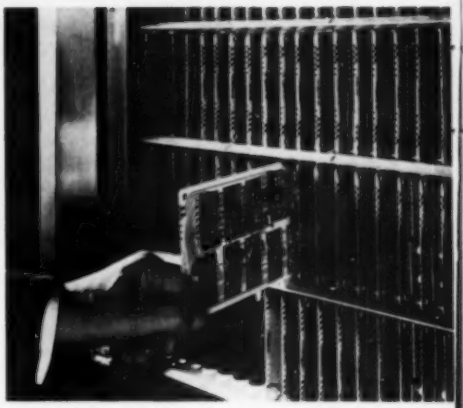
**What does color do for the system?**

As seen here, the colors used are red, blue and yellow, and they vary according to equipment function and shape. The components fall roughly into two general shapes: tall rectangular boxes with comparatively narrow depth, which serve as the frames for the large, stationary units (the computer, memory storage, tape stations, switchgear and power supplies); and stockier, movable units—the console and those which need to be easily interchangeable (paper tape reader, high-speed printer, monitor printer, card reading, punching and sorting units). The stationary equipment was given two shades of blue for the upper parts and sides, and yellow for the lower half; on the movable units yellow was dropped, and red put in its place. The designers have said that use of color was desirable for the stationary units "to

*An operator monitors and controls the functions of the computer and its equipment from this console. Keyboard knobs are in various colors which indicate computer functions and process locations. Maintenance programs are also handled from this station.*




*Block diagram indicates input-to-output process. Actual computer consists of console, program control, tape selection unit, and high-speed storage. Rest of equipment makes up total computer system. From one to eight tape stations are connected into computer for manipulation of data used in a given program. Process data is fed from paper tape reader into computer, is handled by processing components; answers are "fed out" from high-speed printer. Input data can be in form of paper tape, magnetic tape, punched cards.*

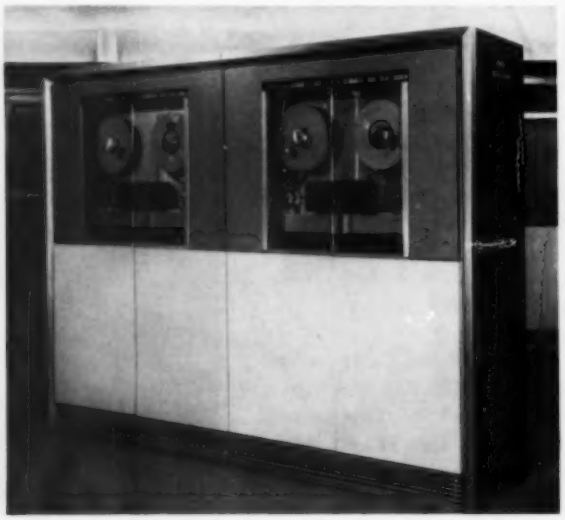


*Principle of modules was employed in construction and assembly methods for electronic circuits. Tiny, solid state devices and other components were assembled on unit blocks mounted on plug-in assemblies. This greatly facilitates getting at faulty parts.*

*This paper tape reader is an input unit to the system. All controls and indicators are located in lower right-hand side. Units measures 46" high, 40" wide 19½" deep. It feeds messages from 1"-wide tape at rate of 1,000 characters p.s.*

*Tape stations are part of computer's processing units. They are used for reading, writing and erasing "electronic" characters on magnetic tape. Like the rest of the equipment, the stations have a leather-like vinyl finish.*

*The high-speed printer is the unit where output documents are prepared. It receives its information directly from the computer block, and can print 600 lines per minute, 120 characters per line. Like other units, it rests on casters.*



set the equipment apart and avoid any feeling of static storage" and that in the case of the movable cabinets "red identifies them as peripheral items and also imparts a sense of direction."

The three basic colors are the first and immediate visual contact with the computer system. They convey to visitors —and presumably to the operator — a cheerful feeling of brightness and clarity, and give the impression of a "cool" environment, fresh and modern. No doubt they were intended to blend with the atmosphere of the modern business office, and the design succeeds in this. In addition, they evoke good humor, a kind of playfulness, with the result that one is more likely to be reminded of an informal, almost "recreational" atmosphere than to be awed by an electronic process absorbing and emitting vital data at a fabulous rate. Does this add up to a lack of dignity? In a way, yes. This is not to suggest that there is a distortion of purpose or lack of impressiveness here, but rather that the design stress is placed elsewhere.

The computer's strong visual impact is not subtle, and in all probability was not meant to be. It would be hard indeed to compete with the design subtleties, the sophistication, of some of the computers already on the market, none of which aim at man's "homeyness." The design of the new EDP system acknowledges that a change of purpose has occurred in computer use during its short lifespan and tries to express that change. The computer has moved from the highly specialized floors of research where it was engaged for some "lofty" purpose to the "mass" offices of nearly all larger— and many medium—corporations, where it takes care of such former clerical tedium as payroll, inventory, and many other types of business data compilation, storage and manipulation. The RCA system seems to satisfy these office needs.

#### Was color essential?

Color seems to be an integral aspect of the total design in its use with the control keyboard and panels of the console (see preceding page). There it helps the operator to identify computer function and process location such as, for example, a station in which an operation is jammed and eases communication between the system and its operator. The colored square keys make a pleasing pattern, and this decorative "plus" results purely from the functional qualities of the keys and switches. In the system itself, however, it cannot be said that color emerges similarly out of the system's design structure. The decorative aspects, while not incidental, are *applied*, and to this extent the unit depends on a separate, external device for its effect. But if the intent was to "set the equipment apart and avoid any feeling of static storage" it is doubtful that the application of color was the only, or even the best, solution. This is not to suggest that color serves no purpose here, but rather that its purpose has more to do with marketing aims than with *performance*.

The new RCA 501 is a general purpose system and like all data processing systems consists of a) input units (the paper tape reader on the opposite page is one of them); b) data storage and processing units; c) output units. These are basic component sections of EDP but the extensiveness of each section and the type of input and output devices depend upon the needed capacity and form of the input data (punched paper tape, punched cards, magnetic tape). The block diagram on the opposite page shows the independent set-up of the various sections to which stations can be added depending upon the range of a given program. This modular "building block" idea underlies the construction principle of this system from circuits to cabinets.

#### A complex of modular units

The design team was consulted by the design engineers in their attempt to work out a sound, logical structure for the modular units. Circuitry is assembled with basic, modularized components which are in turn mounted on plug-in assemblies (top right opposite page) which slide in vertically along the rails," part of the stationary cabinet construction. To distinguish these sections—blocks of cabinets performing one area of the computer actions—a trim of rectangular aluminum extrusions was used to give accent to separateness (middle picture, bottom of opposite page).

In spite of the different ways in which the three basic sections are used, a clear similarity of line gives the equipment unity. Could each basic equipment type have been expressed more emphatically without destroying this unity? Probably, but the designers were limited in their design explorations by the need to use existing tooling as far as possible. In the case of the output printer for example (bottom right opposite page) the tooling for a component used with the old BIZMAC had to be retained. The designers managed to fit it neatly into the overall pattern, but in the case of some units one wonders whether certain lines and angles might not have been more effectively resolved. The base of the console, for example, with its ornate curved lines; or the strong angle of the input reader's front panel which tends to suggest a striving for "style." And why the use of sheet-metal curtains on the tape units? Since the doors that give access to the tape-reels do not slide but are hinged the designers wanted to avoid having them protrude too far when opened. But could this not have been resolved in a way that eliminated the self-conscious curtain effect?

Due largely to size reduction, the system has a very neat and logical floor layout. The components to which the operator must have direct access are arranged in the circular front row while the rest of the system, the stationary units, surround the movable operator's equipment. The stationary units are grouped according to the actions they perform; this provides ready accessibility for servicing and maintenance. A complete RCA 501 Electronic Data Processing system can fit in an area of 35 by 40 feet.—*A.G.*

*Crown Zellerbach*

*John Hancock*

*San Francisco Museum of Art's display of Crown Zellerbach and John Hancock buildings furnishes a studied approach to the problem of architectural exhibition design*

# MUSEUM BRINGS BUILDINGS TO LIFE

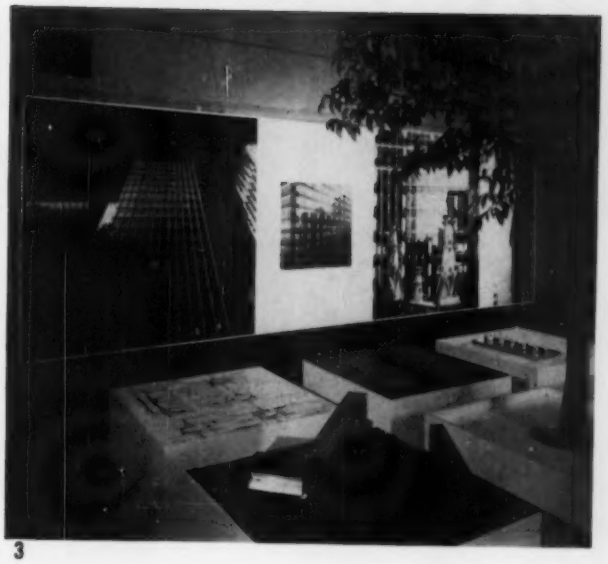
Two recent architectural exhibits at the San Francisco Museum of Art furnish an effective, yet simple, solution to a special problem in museum display: that of re-creating inside a room the spatial and material "presence" of an immense edifice. The John Hancock Building (Skidmore, Owings and Merrill) and the Crown Zellerbach Building (Hertzka and Knowles, in association with SOM), both of which are presently under construction in San Francisco, were exhibited by the Museum in an attempt to develop public awareness of the esthetic qualities of contemporary business building, using these two office towers as examples. Some features of the structures—such as Crown Zellerbach's glass curtain wall—will be new architectural sights in the city's downtown buildingscape.

The designers of the exhibition (a committee headed by Charles O. Perry, of SOM) were aware of the tendency of architectural displays to offer the viewer simply a collection of miscellaneous pieces of information about the buildings. To avoid this, the San Francisco show was designed to conduct the spectator through a coordinated arrangement of models, photos, photo-murals, working sketches and examples of building, landscape, and decorative materials whose total effect would be to put him in the presence of the buildings themselves and to show him how they had "grown" from empty site to finished roof.

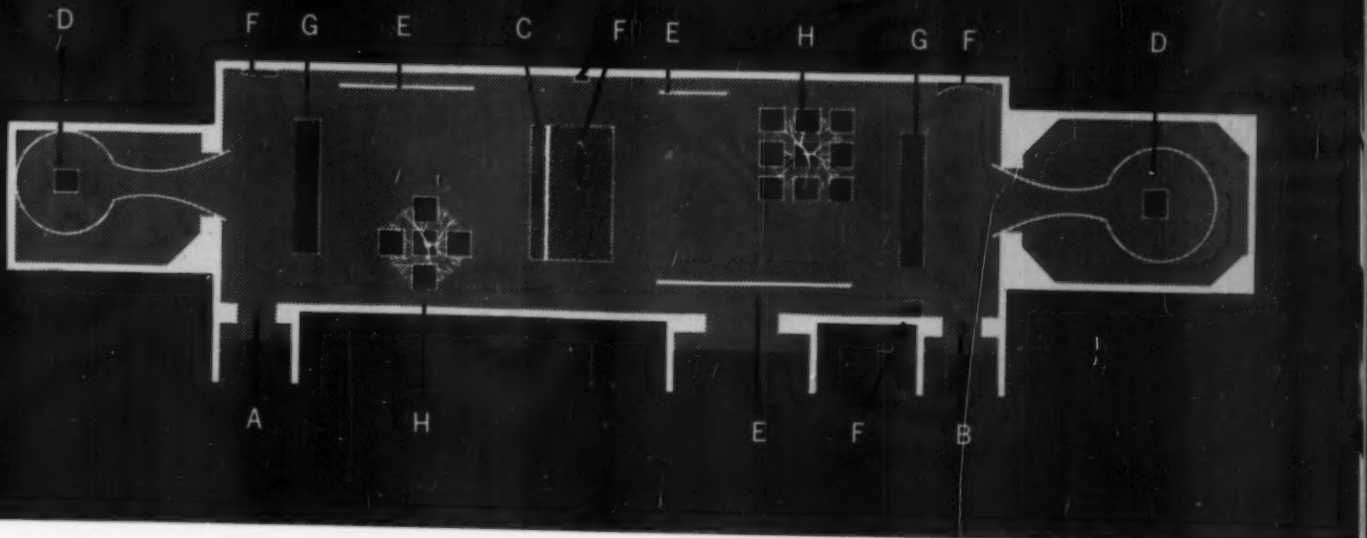
The "Two Buildings" exhibit occupied a single room with two entrances, one at either end (see floor plan, opposite page). This separated the Crown Zellerbach display from that of the Hancock Building, permitting the designers to make effective use of the great volume of the one large room, yet at the same time guard visitors against confusing the two exhibits.

1

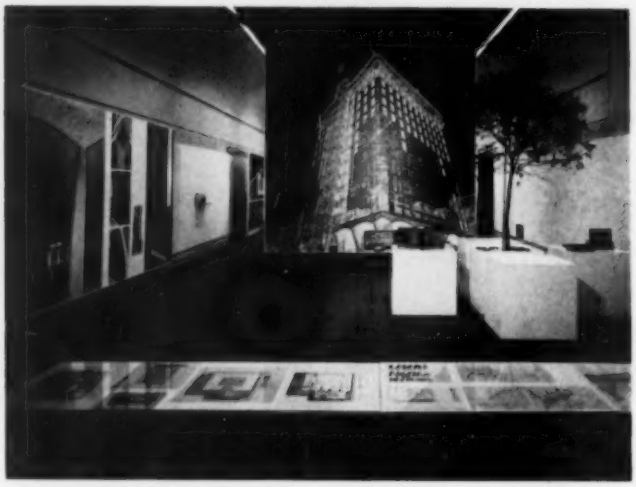
2



3



## Exhibit Is Designed to Re-create Physical "Presence" of Buildings



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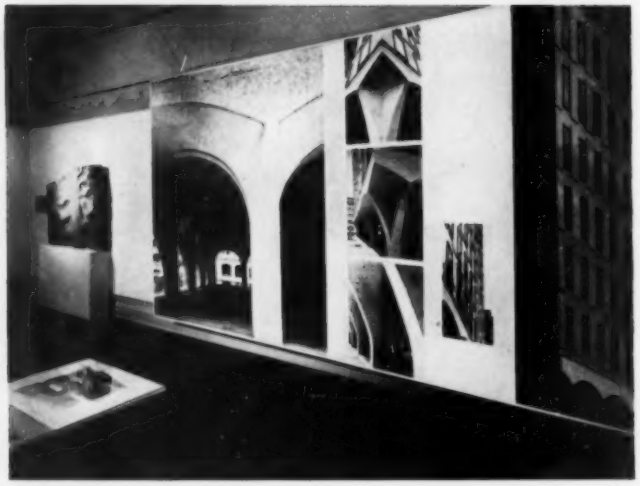

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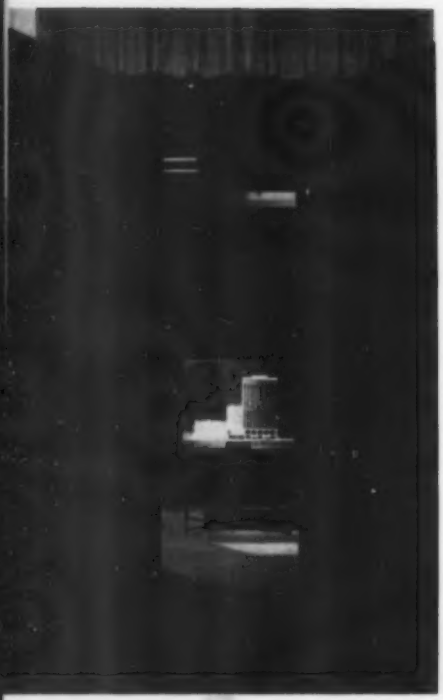
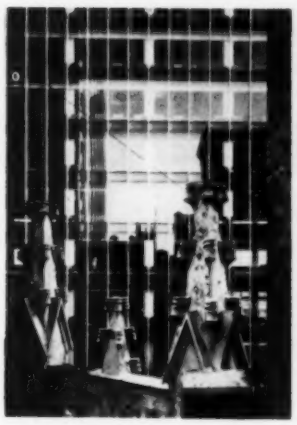
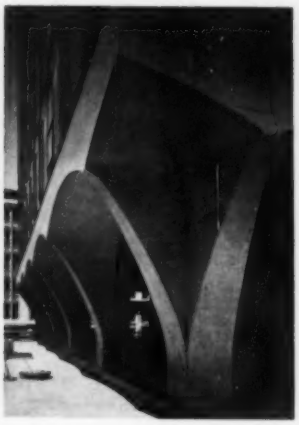


1

*Exhibit of Hancock Building begins with model display* (1), *continues with photomural* (2) *at far end of exhibit which also includes display of architects' drawings, building and landscape materials, other photos and model of sand sculpture* (3).

**Pictures at the Exhibition** *complemented overall views of the buildings with presentation of various aspects of the structures, emphasizing both visual and tactile values. Below left, part of Crown Zellerbach's glass curtain wall. Other pictures are of Hancock's arcade, facade.*





*Far left: From drawn letter to pattern plate to matrix to type block—the genesis of a type face. Left: Jan van der Ploeg, design director at ATF, and Freeman Craw, graphic and type designer.*

# GENESIS OF A TYPE FACE

*by Irma M. Weinig*

*Bringing a new type face into the world today is a long and painstaking process, as the designer guides his handiwork through machine processes introduced to this age-old craft at the turn of the century. It is also expensive, which makes it imperative to design type, however fresh, that is useful enough to stay in the specimen books for a long time.*

When type designer Freeman Craw sits down to draw a new type face, as he has been doing increasingly lately (Craw Modern Bold is just being distributed to printers by the American Type Foundry, two faces are waiting to be cut, another face is in process, another contemplated), he is practicing an art as old as writing, an art which persists despite the inroads of the machine. A printed page may look like the last word in mechanical precision, but what gives it color and character is the type designer's hand-drawn curves, the way he branches an *m* or *n*, brackets a letter to form the serif, slants and curves an *S*, rounds an *o*.

"How original and how different a letter form is, is no criterion in judging it as a potential type face," says Craw, who is art director of Tri-Arts Press. "How good and useful it is in keeping with needs of design today—that is the main consideration." Although Craw believes that the letters needed today for modern buildings, interiors, and graphic design should be modern in form, he also believes they should be consistent with the principles of designed letters as evolved during the past 500 years. Such devices as changing the direction of a serif or adding new ones, or reversing the age-old relationship between thick and thin lines tend to produce type that calls attention to itself to the detriment of the design in which it plays an important but subsidiary role. Novelty alone might make it popular, but not for long. The thoughtful type designer takes advantage of the authority which the printed letter has accumulated since the 15th century, and which so many hand or processed letter styles do not have. A useful letter should be as anonymously familiar as a coin or stamp; no one reading it should be driven to question its origin.

*Oldstyle Garamond G (top) has diagonal slant (prove by connecting thinnest parts of letter curve) and hand-finished serifs. In contrast, modern Craw Clarendon G has vertical stress, greater difference between thick and thin lines. Although the Clarendon has a more precise character, neither is without the influence of the human hand.*

What makes a letter modern in form? Serifs alone are sometimes thought to be the determining factor, but Craw believes that such things as basic construction are even more valid considerations. He points to the vertical stress, uniform proportion of letters, and contrast between thick and thin lines, as characteristic of the modern roman letter. One of his favorite ploys is to draw just the counters (the areas enclosed by a letter) of a modern E and a Renaissance E to demonstrate the precise, machine-made form of modern in contrast to the hand-drawn quality of old style faces.

The first modern letter faces appeared early in the 19th century, and their use here, and in England and Germany, paralleled the growth of machine production and, also, of advertising. As the linotype machine took over the typesetting of newspapers and their books, and readable, if not very lively, type was designed for it, the only expanding market for hand-set types was for notices, posters and other matter where instant impact was vital. Bold, strong letters had this power, and many types of increasing blackness were designed in this period.

But just as many artists, architects and designers reacted against the dull, graceless products of the machine at the beginning of the 20th century, so type designers of the same period turned away from the modern faces that machines produced. Designers such as William Morris, Bruce Rogers and Fred Goudy spearheaded a movement back to Renaissance type designs. One of Morris' first faces was a re-drawing of Jenson, originally designed in 1470 for one of the first Venetian presses. This movement, which began with book printing, soon spread to every form of graphic expression; and it took the far-reaching revolution of modern art, particularly Dadaism and de Stijl, with its dramatic effect on graphic design, to reinstate the modern letter.

At first this second coming of "modern" simply meant a letter without a serif (a form that harks back to 5th century B.C. Greek letters and thus antecedes the classic Roman letter with its serif), but a serif is more than an ornament—it actually knits the letters into words and is an important factor in readability.

### Designing Craw Clarendon

In late '54, Jan van der Ploeg, director of type design for the American Type Foundry, the only maker of foundry type in this country, felt that although the use of formalized square serif letters such as Beton and Stymie was definitely dropping off, the interest in a letter of this general appearance remained strong. Since both were later adaptations of the Clarendon letter, and since



*The 1870 Music Hall poster features a badly spaced Clarendon among its many type styles. In graphic design of that day, types attracted attention by their boldness and oddities. Craw Clarendon, freed of the idiosyncracies of the past to try to meet the needs of design today, made its debut in the Ohrbach's ads.*

he had been getting some requests for Clarendon, it seemed logical to recut one of the Clarendons in the ATF files. There were literally hundreds of versions, inherited from the 25 foundries which had joined in 1892 to form American Type Foundry. (Each had been cutting letters of the same general classification, but always with some slight deviation to ensure keeping a once-supplied customer.)

Despite the surfeit of designs, van der Ploeg found none that was satisfactory for today. The letters needed to be reweighted, reproportioned and stripped of idiosyncracies introduced by the various cutters. He suggested to the president and vice president in charge of production, who make up an informal type committee at ATF, that they invest in a redrawing of Clarendon. He argued that a type used widely for six or seven years could return an investment of about $35,000 to $40,000.

Craw, a fellow member of the Type Director's Club and a designer whom van der Ploeg admired for his sensitive handling of type, was asked to undertake the re-drawing. What was the nature of the product he was asked to redesign?

Each letter in a type face sits on a separate block of metal; and, ideally, each letter is limited to its block. If a letter extends beyond its block (which happens sometimes with italics) it can be kerned, i.e. cut away from beneath so that it will overlap the next type block. But this means a delicate type block, difficult to pack, and sometimes it adds extra pieces of type to the font (occasionally extended letters cannot be kerned and must be cast as ligatures—in the case of *f*, these ligatures would be *ff*, *fi*, *fl*, *ffl*). This is a refinement which type founders are anxious to avoid.

The types made by ATF are hand-set by a typographer, and actually used in the printing press, as distinct from type used on a linotype or monotype machine, where it serves as matrix only, from which slugs are cast. A font of ATF type, containing capitals, lower case and figures in a ratio based on frequency in normal use, ranges in price from $10.15 for 4-point size to $33.95 for 72-point. The smaller faces are cheap enough to be discarded after one use—rather than go through the time-consuming process of redistributing them (the larger ones are not expensive either, but may require replacing every few years). A font of foundry type is a quality product that can have some of the hand-drawn quality associated with a craftsman's work.

Since hand-setting is an expensive operation, these faces are used primarily for titles and headings in magazines, books and pamphlets, and for posters and advertising. Small printers throughout the country, who generally do not have linotype machines, will use them for any jobs coming their way. (Interestingly enough, although the popularity of a face is strongly influenced by its acceptance by art directors, ATF's biggest market is with small printers.) It was a display type, then, that Craw was drawing, one that would be used mostly in larger sizes, one that could be bold and powerful.

Study of the Clarendon letters convinced Craw that the fundamental failing was an imbalance between the capital and lower case letters—the capitals were so much heavier and larger, and the ascenders and descenders so much longer, that the result was an uneven, spotty accent. He wanted to redress the balance, but he did not want to lose the basic flavor of the letter. Since this was a matter of careful change, he enlarged each drawn letter to refine the design in the smallest detail, then reduced the letter again to normal size.

The process from drawn letter to type face begins with combining a group of key letters that includes a capital letter, ascending and descending letters, and other lower case letters to test their size

relationships. Once approved these will set the size standard for the rest of the alphabet. Then *H, O, m* and *o* are designed and cast into type in all the sizes in which the font may be produced—in this case, from 8-point to 72-point. Step one in type-casting is enlarging Craw's 36-point drawn letter (about ½ inch high) to 6 inches in order to smooth out the drawing to meet the requirements of a machined item — without, however, erasing the irregularities and hand drawn character which give it liveliness. It is here that care must be taken to preserve the artistic and human element in the type design against the slickness and dexterity of the machine.

Sensitized metal pattern plates are then photographically etched from the 6-inch photo.

The process of making a matrix used to be a hand operation which was so difficult that the punch cutter became in effect a second designer (or, as was often the case, the punch cutter *was* the designer, i.e., Caslon, Baskerville, Bodoni). Now it is an exact machine process, and the art of cutting a punch—filing away around a letter drawn on a steel bar which is then punched into soft metal to make the matrix—is lost in this country. Replacing it is the Benton Matrix Engraving Machine, invented in 1885, which works on the pantograph principle and cuts the matrix exactly to pattern as the operator guides a stylus over the etched-out area. The operator is still a skilled man, who must know how often to pass over a given area to get the correct depth of cut, and when to change to a finer cutting tool—but he is in no sense a creator.

Working from the same pattern, all sizes can be cut and the machine introduces modifications to correct optical problems: as letters become smaller, they appear narrower and lighter and the reverse is true as they grow larger. To correct this illusion, the machine will make a smaller letter bolder and wider than the master letter of 36-point. There is another problem, however, which the machine cannot handle. With Clarendon, the counters were so close that they formed potential ink traps and the serifs almost met in the smaller sizes. Craw went back to the drawing board to do new versions which, of course, look to the naked eye exactly like their larger relatives. One of his special concerns was to see that there was a definite cut in all sizes where the bowl and stem of the *R*, and two bowls of *B*, met.

The matrices next go to the fitting room, where the letter is positioned on the type body according to the original design, which has set the space between letters and also their position on the type line. The standard distances are set between two straight-sided letters (*H-m*), between curved and straight (*H-o*) and between two curved (*O-o*). The general rule is that the space between two curved strokes must be smaller than between two straight ones to make them look equal, but exactly how much smaller depends on what looks best. In Clarendon, the *o* has slim sides and is slightly elongated to make fitting easier.

Slant-sided letters (*A,v,w*), because they create a wedge of white space when fitted with another letter, present an insoluble problem for the fitter. One solution, which has been resorted to on one of the old Clarendon faces, was to cap the *A* with a serif. Today's solution is to make the serif as short as possible, and to send the letters on a regular type block to the typographer who will, if he is conscientious, cut into it to get a good fit. ATF used to perform this service but, since each typographer had differ-

**Bar SOUNDS**

Dry REPAST

Effectual CALUMNY

*Above the line: Faces of the Clarendon family used in the 19th century: a bold, a book, and a condensed illustrate the adaptability of modern faces. Below: Craw Clarendon Book and Craw Clarendon. The serifs are more sensitively handled, more gracefully bracketed and shortened to avoid flat-footed look. (compare A's). Craw Clarendon is better proportioned than older bold face (compare D's). In general the new faces are more normal and readable, which is attributed to the better size relationship between letters.*

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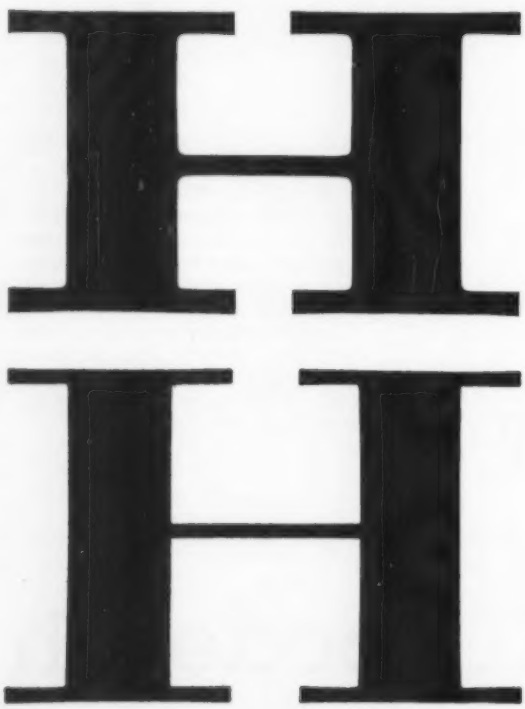
ABCDEFGHI abcdefgh

**ABCDEFGH abcdefg**

*Benton Matrix Engraving Machine automatically contracts the width of larger letters and expands the width of smaller ones in relation to their heights to correct optical problems. Example: directly below, an 8 pt. Craw Modern Bold H enlarged photographically and, below that, a 72-point one cut on the machine.*



ent requirements, soon gave it up.

Three sets of proofs were pulled of the *H* and *O* combined with every other capital. Craw took one back to his studio, van der Ploeg studied his in his office, and the supervisor of the foundry got the third copy. The letters were pored over day after day to check proportion, spacing, slant, weight, inconsistencies, anything that looked wrong to the eye. Since the eye is unreliable, a lot of the ideas had to be "slept on."

Many proofs were marked with instructions to turn this or that letter clockwise or counterclockwise, in the search for a straight up-and-down appearance or the correct slant. Generally, this can be assured by slanting the letters very slightly forward—but again, how much? It turned out in the Clarendon that the *b* and *q* required a greater forward slant than the other letters to look straight. The *S*, on the other hand, kept a slight backward stress which Craw felt was characteristic of the Clarendon family. To make the letters seem uniform in size, rounded lines (*o,p,b*) descend slightly below the base line, and ascend above the waist line.

The painstaking process took ten months, somewhat longer than usual. It was worth it. Robert Gage, art director of Doyle, Dane & Bernbach found Craw Clarendon "fresh, straightforward and readable," and launched it in the striking new Ohrbach's ads. Craw Clarendon is on the cover of *Architectural Forum* and used throughout its pages, and Clarendons can be seen everywhere today, in industrial ads as well as fashion ads in little magazines, in smart ones, on the new cigarette packages—and on the cover and department headings of ID.

It may not always be Craw Clarendon that you see, for similar faces are being made by European foundries, and there are no patents to protect these type designs. Craw Clarendon's continuing success is a tribute to his fidelity to the belief that a distinctive letter freed of archness will prove not only useful but lasting.

**Proof sheets** of Craw Modern Bold illustrate the minute attention to detail necessary to fit, proportion, space, and weight letters to produce a pleasing type face. In this case, Craw was designing a bold version of a face he had already drawn, but this seemingly simple job took longer than the redrawing of Clarendon. Preserving the character of the face while adding the authority of boldness was part of the problem. The trick was to embolden the letter yet retain its crisp and elegant character.

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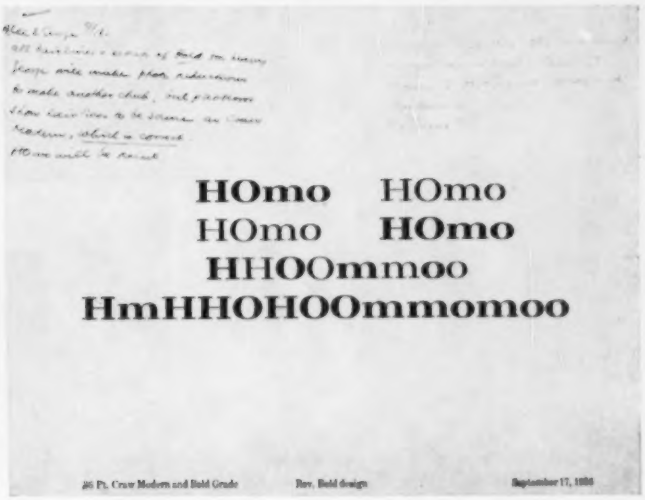
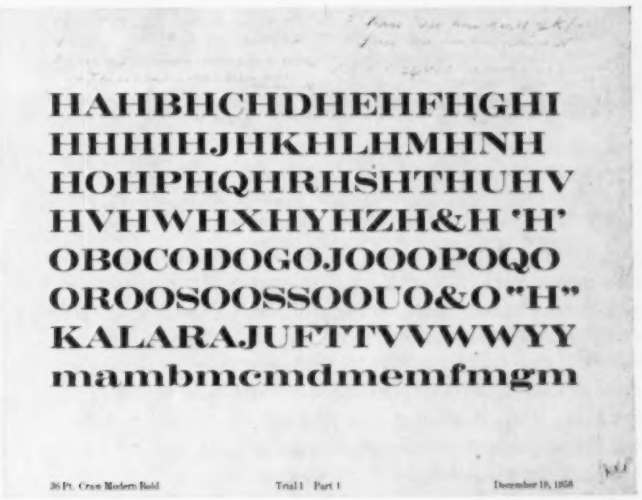
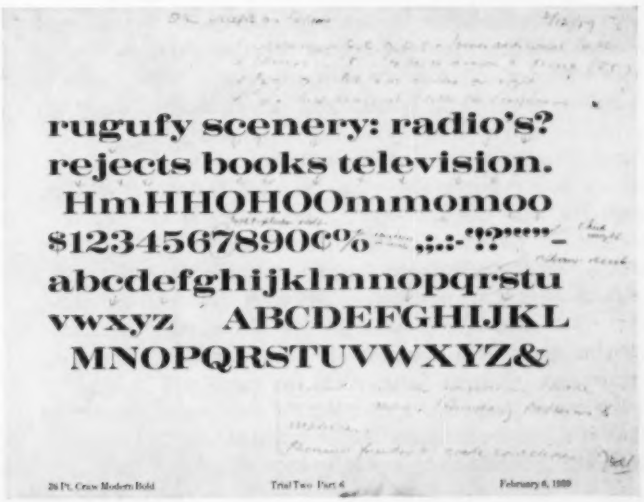
*Instructions on the proof sheet: "All hairlines and serifs of bold too heavy. Make photo reductions to make another check, but patterns show hairlines to be same as Craw Modern, which is correct. HOmo will be recut. Serifs on left of cap H are .050 (on pattern) longer than on right. Hence O between 2 H does not appear to be centered. Fix same?"*




*"OK except as follows: lowercase c, e, g, o, s, lower additional ¼ pt. below type line. Lowercase r to be redrawn and recut. Fig. 7 fit ¼ pt. tighter on right. %—check diagonal stroke for roughness."*




*"Should we add ¼ pt. to right of B.E.? Should we add ⅛ pt. both sides of S? Rotate cap S counter-clockwise (very little). Cap J too far below line. Follow lighter weight. Shave ¼ pt. from right of K. Shave ¼ pt. from both sides of N."*



# The Guggenheim: great architecture, difficult installation

*by George McAuliffe*

The Solomon R. Guggenheim Museum, Frank Lloyd Wright's only major work in New York City, was finally opened to the public on October 21st. Designed for a capacity of 1500 people (and host to 16,039 on the first Sunday after it opened) the Guggenheim's curvilinear form provides the most dramatic setting contemporary art has ever had. At the same time, it creates new and serious problems involving the important relationship between architecture, painting, and the viewer.

Although the work of extraordinary men cannot be evaluated the morning after it happens, it *is* possible to say what the Guggenheim is, if not what it means. As you enter, you are immediately struck by its visual excitement: beautifully finished, soft, mellow tan-colored concrete surfaces alternate with a white band set with a mosaic of paintings, all spiraling upward and inward, and penetrated rhythmically by the vertical structural ribs that continue on to enclose the dome. The ramp can be traveled from bottom to top or, by taking an elevator to the dome, from top to bottom. Either way, you have the breathtaking experience of viewing the magnificent Guggenheim collection in toto, as well as in detail, across the cylindrical airspace. Certain abstract paintings, those that are particularly powerful, gain a new dimension when seen in this way: there is a distinct pleasure in viewing them at a distance and in anticipating their reappearance, close at hand, when the ramp will eventually bring you to them. It is a uniquely different experience from that of a conventional rectilinear museum, where paintings are come upon suddenly, or can be approached at will.

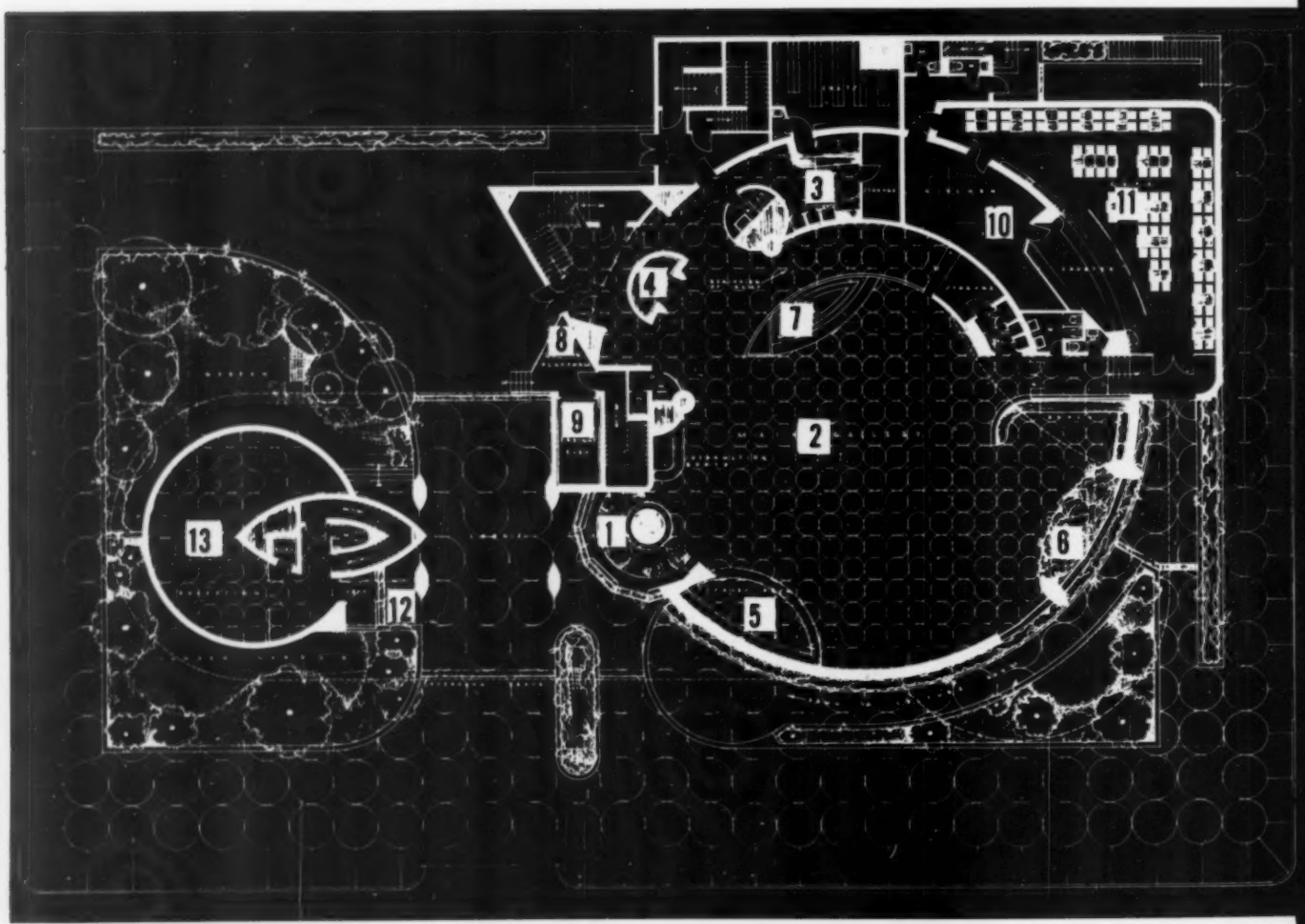
The continuous ramp is divided into circular bays by the vertical structural ribs. Paintings against the rib walls are hung flat, but those along the curving outer wall are ingeniously and invisibly projected from the wall by means of slender white steel rods attached to the center back of the paintings—an innovation of James Johnson Sweeney, the Guggenheim's director. They are bathed from above by a combination of natural and fluorescent light and, almost literally, float in space. But the relationship of the paintings to the graded ceiling and floor creates the unpleasant impression that somehow all the paintings are askew. Wright wanted the paintings tilted back against the wall, easel-fashion, and lighted only by natural daylight. But it seems doubtful that this would have been any better.

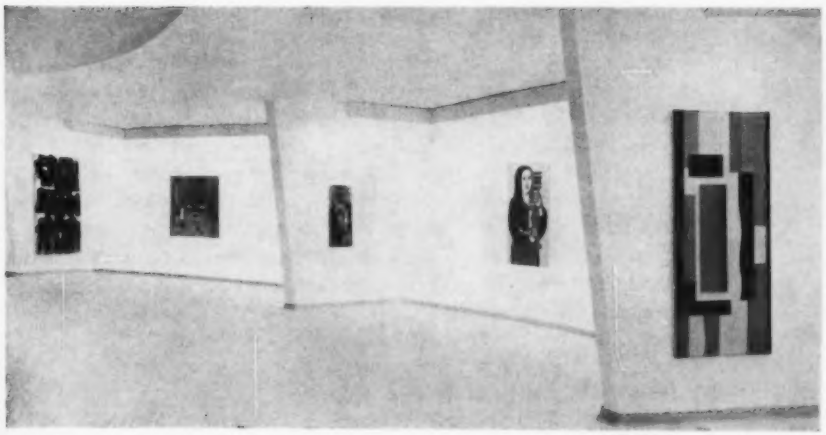
Eventually the Guggenheim's quarter-mile spiral course begins to seem too rigidly constraining. Also, one becomes aware that 90 degrees of every turn of the circle is taken up by services, occurring at regular intervals and therefore breaking the arc into 270-degree segments. Furthermore there are no resting places until the lower level, where there is a choice between the visitors' lounge or, three steps up off the ramp, the High Gallery, an enclosed, less brilliantly lighted, two-story space assigned to heroic-size painting and sculpture. Other than the main floor, the Gallery is the only area of the Museum with a level floor, essential for large sculpture.

Whatever the defects of this structure as a museum (and some of them may not be the absolutes that custom now tricks us into thinking they are) the Guggenheim is thrilling architecture every inch of the way.

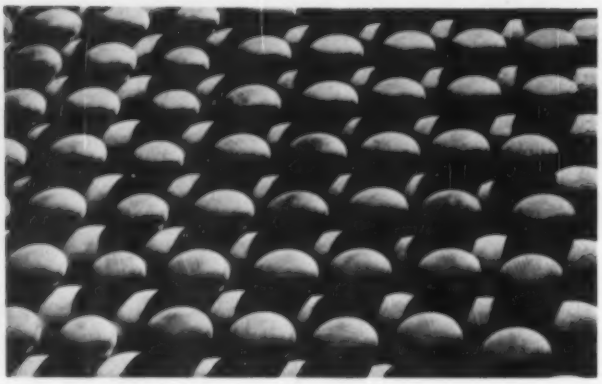
*Looking upward from parapet (top) viewer sees widening inward thrust of continuous spiral ramp; concave portion, containing painting bays, plays against convex portion that serves to bypass utility core. View downward is a similar kaleidoscopic architectural pattern: in defiance of gravity the diameter of the well becomes larger and larger at each successive lower spiral, and each spiral falls further away from the perpendicular. Space is lighted by meticulously detailed glass dome, by a continuous rim of narrow fenestration recessed at 45 degrees into wall between spirals, and by large window on southwest side of main floor; individual bays also have fluorescent fixtures. Window on main floor in effect carries Central Park across Fifth Avenue and into Museum; this is Wright's only concession to site. In late afternoon (bottom) it is penetrated by low western sun, the rays being filtered by an ivy trellis outside, which together with the sculpture, casts long shadows across terrazzo floor. All floors inside are scribed into circles which are repeated, in a somewhat larger size, in paving on sidewalk outside Museum.*

*Museum is a self-contained entity, not at all deferential to its neighbors. Entrance is a keel-shaped overhang that connects smaller administrative core* (13) *to larger gallery complex* (2). *Entering visitor is exposed to contrast between two thin, fin-shaped columns on left and massive cantilevered visitors' lounge on right. Entrance itself is wide and low, but beyond it, space immediately soars the full 95 feet of structure. Circular ground floor is broken by three contrapuntal semi-circular forms: an oiled walnut reception desk* (5) *at entrance; a blue pool* (7) *at beginning of ramp; and a pebble and ivy garden* (6) *on west. These forms provide color and textural contrasts and, when seen from levels above, immediately key viewer's position on spiral with relation to main entrance. Coat check is at* (1); *semicircular passenger elevator at* (4); *kitchen is* (10); *adjoining cafeteria is* (11). *Works of art are delivered by truck to platform* (8) *and carried aloft in freight elevator* (9) *to exhibition level, or to suspended open storage racks on top level. Smaller administration entrance* (12) *at front of building, is inconspicuous.*





*Traveling along ramp (above) viewer is unconsciously propelled by grade and directed into successive bays by gently canted ceiling that soars slightly upward and away from low, protective parapet. All surfaces inside canted portion of ceiling are painted soft tan; all surfaces within individual bays, including ribs, are painted white. This combination of color, together with lighting, produces an overall space that has tremendous vitality and dignity—yet is easy to comprehend. Against it, each painting becomes very powerful, and viewers, too, become an important element —their silhouettes, their attitudes, the color of their clothes, and especially their movements, become in effect a secondary frieze, a living mosaic. Most of Museum's serious shortcomings occur within individual bays (left). Unfortunately the bays are poor in some detailing, such as the harshness of the fluorescent light bo installations, their sharp lines and corners clashing with the pervasive roundness of the structure.*



*Subtle changes in baseball, and less subtle changes in football, call for corresponding changes in the equipment that makes playing safe — or at least possible — in a field in which design is a matter of*

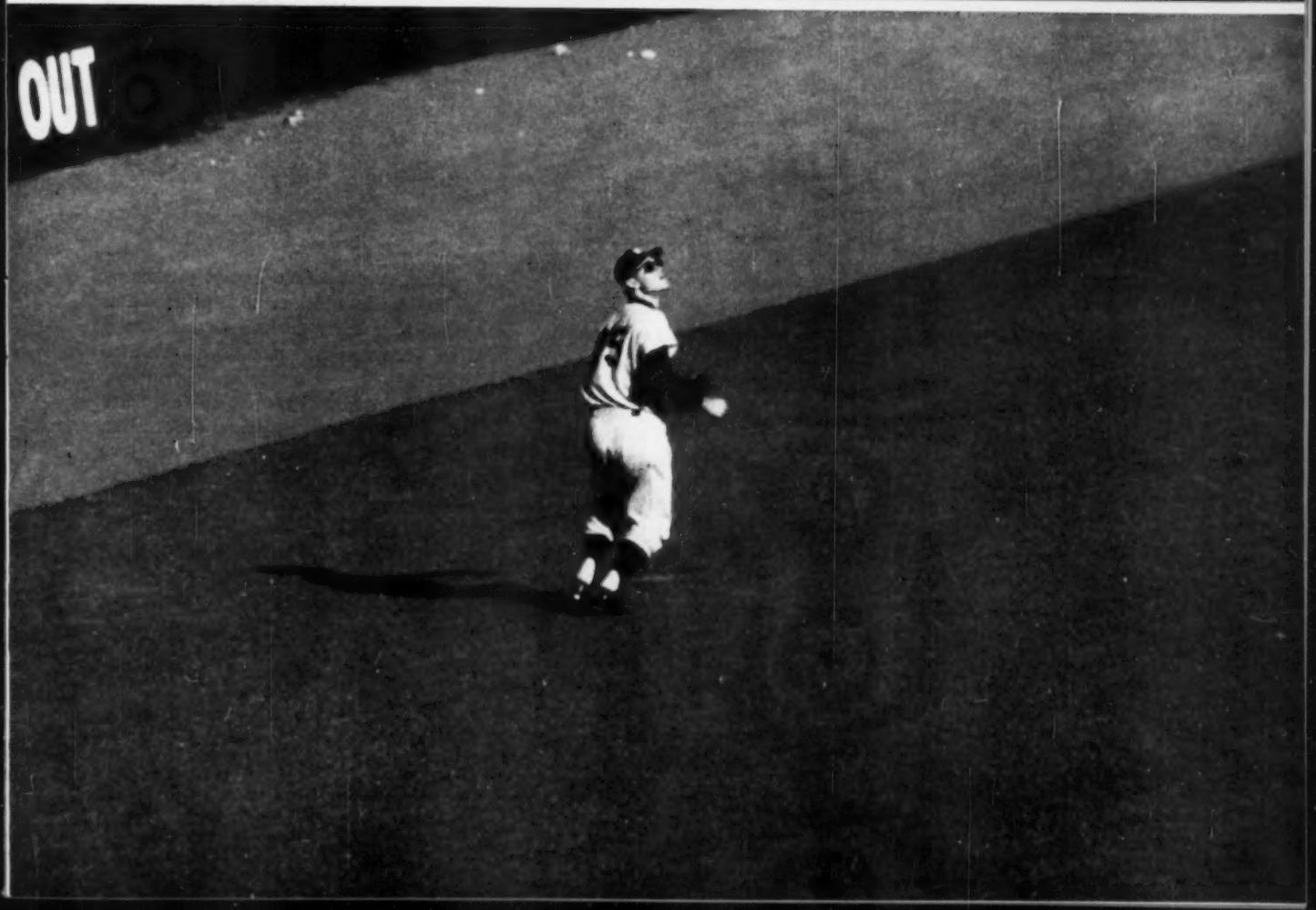
# THE WAY THE BALL BOUNCES

*by Willard Manus*

The worlds of the two athletes on the opposite page seem far apart, and they are, at least to the extent that the world of this hard-driving Baltimore Colt halfback is violent and warlike, while the world of Yankee outfielder Norm Sieburn is, by comparison, pacifistic and genteel. But the two men have a great deal in common, apart from being superb professionals, masters of their respective trades: neither of them could have achieved what is shown here without the aid of the equipment he is wearing. With the possible exception of pinochle, there is no sport in America today in which performance does not depend to a large extent on the design and style of the equipment its players use. And while the designers of baseball and football equipment are of necessity specialists, their work bears much relevance to all design. For it must not only meet the requirements of safety and function in an area in which equipment is often the difference between winning and losing, or even life and death, but it must also satisfy the new and arcane needs of a highly competitive industry. And since baseball and football are not just sports but *spectator* sports, the equipment must also look at least presentable, and preferably even glamorous, to those in the stands and in the living room.

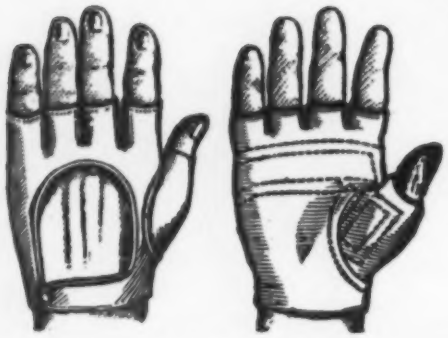
The makers of sporting goods bear more than a little resemblance to the makers of automobiles: they jealously try

Photos on opposite page courtesy Sport Magazine


OUT

*The Chicago Baseball Club*, 1882


*The Trap-Eze is the first glove that fits the player's hand on the thumb side as well as on the little finger side.*



*In the 1870's models of these gloves were advertised as selling for 50 cents. Baseballs went for 40 cents.*

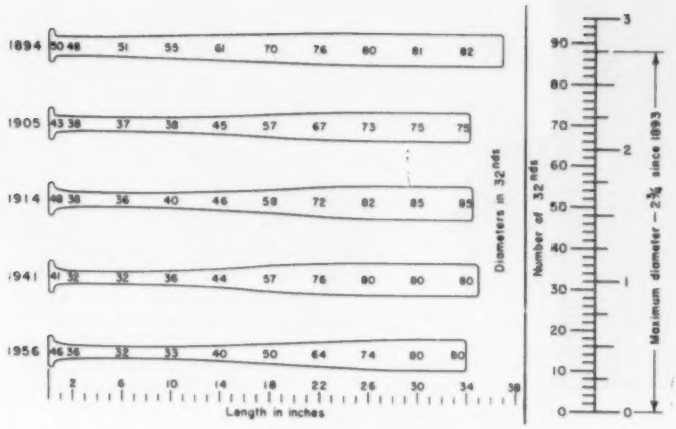
*Modern catcher's mitts are built for flexibility, protection, and to withstand heavy punishment.*

**BASEBALL,** *which began as a bare-hand game, now uses a glove with six fingers*

to keep every advance in design from each other, yet they steal from each other, they spend enormous amounts of money in experimental research and engineering; they insist on changing models every year, even if it amounts to nothing more than frill. And, as in Detroit, the stakes are big—several million Americans play baseball and football today. On the professional level (and, very often, on the amateur) the games assume the proportions of great spectacles, what with their accoutrements of immense stadiums, do-or-die fans, network television, and public relations hoopla. Manufacturers understandably feel that what is good for baseball and football is good for America.

In the beginning, though, it was all much more primitive. The mustachioed gentlemen of the 1860's who played baseball (above, left) scorned the use of gloves and mitts as being decidedly effeminate. It wasn't until 1877, when the great and beloved A. G. Spalding appeared at his first-base position wearing a cut-down black kid glove (above, left) in which he had stuffed some padding, that this judgment was renounced. Players began using gloves, catchers began protecting themselves against foul tips and errant pitches by donning various pads and masks which came to be known as the "tools of ignorance." Most early gloves — small, lumpy and heavily padded — were designed more for protection than for flashy fielding.

The first major change in glove design came about in 1919 when the Rawlings Bill Doak model was put on the market. (Doak, a great spitball pitcher of the day, designed the glove himself.) It had a heavy heel which made for a deep pocket to receive the ball, and it featured a radical change in webbing construction: it had a much larger web designed not just to hold the fingers together, as previous webs did, but actually to catch the ball. All further changes in glove design have been variations on that primary construction, says Harry Latina, who is perhaps the most well-known glove designer in the field. Latina at one time played professional baseball himself, went to work for Rawlings shortly after the original Doaks model came out, and is the man responsible for the newest innovation in glove design: the Trap-Eze, the six-fingered glove (above, right) now manufactured




*Hitting stars Ty Cobb, Honus Wagner and Eddie Collins began the trend to thinner handles. Hitters 20 years ago used bats of around 40 ounces; but today 37 ounces is considered a heavy bat. Weight is not limited by rules: Babe Ruth used bats as heavy as 54 ounces.*

*Every major leaguer must wear safety helmet (or insert) at bat. The rule is also in effect for players in the Little Leagues.*

by at least one company besides Rawlings. He developed this unorthodox glove after first field-testing six different models of it in various major league training camps where he turns up every spring with notebook and assistants. The sixth-finger feature is an adaptation of the construction of first-basemen's mitts; the "finger" and its flexible lacing allows the web to depress when a ball makes contact, and it has a tendency to "grab" and prevent the ball from bouncing out.

There have been few other significant changes in other baseball equipment over the years. Hillerich & Bradsby Co., makers of Louisville Sluggers, report that, as in the old days, bats are still made mainly from ash, and that, with the advent of the "live" ball and the home-run, hitters now favor a light bat with a narrow handle and a large barrel over the old-time bat with its reverse proportions (above, left). As for that "live" ball—always a controversial subject—major league officials and manufacturers claim the ball is the same as it was in 1927. Ball designer Milton B. Reach, of Spalding & Bros., points out that some considerable slugging was done even before 1900. His uncle, A. J. Reach, the leading power hitter of that time, was once credited with nine home runs and thirty-four runs batted in during one day's play.

Essentially the ball, even from the start, has always been pretty much what it is today—a rubber core (now cork-cushioned to insulate it from constrictive forces of moist yarn and/or the impact forces of bat contacts), surrounded by tightly wound woolen yarn and covered with leather (horsehide). The same holds true for the rest of the game's paraphernalia—spiked shoes have changed only to the extent that they are lighter and more flexible, uniforms are now fancier and lighter in weight (less wool, more synthetics) and so on. About the most radical equipment change is the safety helmet that most players now wear while at bat. (above, right) These helmets (or inserts) of tough, shock-resistant plastic shells of high-impact strength are worn as protection against beanings; some ballplayers take advantage of this protection even while running the bases.

If baseball equipment has been refined—but not radically changed—over the last twenty-five years, football equipment has been drastically revised. Its evolutionary changes have

*"Flying wedge," with hand-grips on pants, was introduced by Harvard in 1892, when substitutions were almost unheard of. Injured or not, a player remained in game until he had to be carried off the field.*

*First shoulder pads, introduced in the 1890's, were small patches of leather-covered curled hair. 20th century produced pads that protected shoulders, collarbone, and shoulder blades. Their effectiveness led to pads for knees, elbows, and thighs.*

1898

1909

**FOOTBALL** *remains the roughest of games, with only equipment design to make it safe*

been anything but minor. The game itself is far different from fifty years ago, and it has made stringent demands on manufacturers to keep up with the pace. It was a long time in coming, but now all major manufacturers are sponsoring projects by engineers and scientists in the hope of developing equipment that will truly make safer a game which is undoubtedly the roughest in the world. (Though many football men point out, with statistics to back them up, that an individual is safer on the gridiron than in most other areas of our mechanized society.)

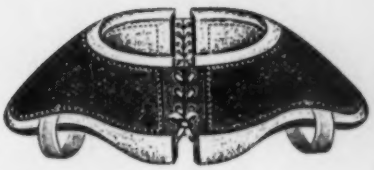
Most experts credit William S. Gummere of Princeton, in 1868, with conceiving the idea of organized intercollegiate football, though the game itself, in one rude form or another —Harpaston, Rugby, etc.—has existed since Biblical days. It was Gummere's "Association" rules under which the first game of college football in this country was played—between Princeton and Rutgers on November 6, 1869. The uniforms consisted of old clothes; the ball could be advanced only by kicking it with the feet, hands, head or side. In later years canvas pants and jackets were in order, and a thick bush of hair was considered the best shock absorber for the head. Early football was straightforward, power-laden, bruising; passing the fat, egg-shaped ball of the 90's was precarious. Helmets and pads (see above)—"body armor"—appeared in the early 1900's; a harness of soft black rubber for the head, patches of leather-covered curled hair for the shoulders. Eventually manufacturers began developing pads for the hips, knees, thighs and kidneys.

During that era of the flying wedge (above, left), arm-linked blocking and the flying hurdle—a bizarre offensive maneuver which saw the ballcarrier orbited by two of his teammates high over the line of scrimmage—injuries to players were excessive, particularly brain concussions, broken necks and shoulder fractures. It got so bad that President Theodore Roosevelt ordered legislation passed prohibiting many of those brutal maneuvers, but it was not until 1931, when fifty football fatalities were recorded, that a committee of manufacturers, coaches, trainers and doctors began a comprehensive study of how the game could be made safer.

Out of this study came the development of many protective

1916

1919



1919

*Contoured fibres of this modern shoulder pad fit the shape of the shoulder. Some shoulder arches are reinforced with a heavy steel spring to help absorb shock. Despite pads, many injuries occur when player is hit from a blind side or when he is off-balance and tries to make tackle with one arm.*

devices which drastically reduced the nature of many football injuries. The cantilever-type shoulder pad, for example, designed on the same shock-absorbing principle as a car's knee-action (above, right), helped put an end to the high incidence of broken collar bones and fractures in the area of the shoulder. There were other equipment advances which were important and beneficial, but it remained until 1951 for the first thoroughly scientific study, incorporating recognized principles of mechanics and engineering, to be made. Sponsored by the MacGregor Sporting Goods Company, the study was conducted at the Cornell Aeronautical Laboratory at Buffalo by a team of safety experts.

Their findings have gone a long way toward solving some of the contradictory problems of designing modern football equipment. For instance, how to adequately protect the wearer without turning him into a human battering ram, as did the old steel-hard fibers and plastics. And how to equip him—back and lineman alike—without encumbering him and robbing him of precious speed, the endowment around which today's game is built.

In order to determine just how many of the CAL suggestions have been acted upon, this writer recently visited the locker room of the New York Giants pro football team and with the help of trainers Sid Moret and John Johnson examined some of their equipment. The typical Giant wears the following armament, from top to bottom:

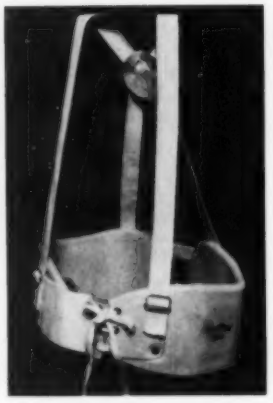
1) A helmet of the type developed by the CAL (described on page 77). Inside it features what CAL called a "geodetic suspension system"—a network of nylon suspension straps and "beam pad" shock absorbent material which serves to disperse the force of a blow over the entire head, and to reinforce the normally weak sides and keep the helmet squared on the head. In order to protect the "other guy," the hard shell is cushioned with a band of energy-absorbing plastic.

A faceguard, usually one or two bars of Crayolite which curve over the lower part of the jaw. Faceguards were not mentioned by the CAL, but the pros find them important.

2) Shoulderpads, but hardly any of the kind developed by the CAL—soft, close-fitting pads, much akin to heavy underwear, which covers the chest and back. Most players still


*Helmet (above) with clear plastic face-mask is not used by professional teams, who prefer style at right which is now used by almost every player in the league. Trainers report that it has cut down on incidence of dental injuries by as much as 80 per cent.*

*Rib and hip pads of lightweight vinyl plastic afford protection, mostly for blocking and tackling. Safety study reports that tackling, blocking and being tackled or blocked accounted for 54.4 per cent of all football fatalities from 1931-1955.*



favor the big, stiff, cantilever pads, thickly padded with vinyl plastic, which sit high atop the shoulders. In evidence were a few models of pads made entirely from vinyl plastic or foam rubber, but trainer Moret said that none of the players considered them protective enough for game conditions.

3) Rib and hip pads, some old-style—corrugated fiber, nylon-covered vinyl; some new-style, an outgrowth of the CAL report—"girdle" pads (above) which feature removable pads at the hips, kidneys and spine.

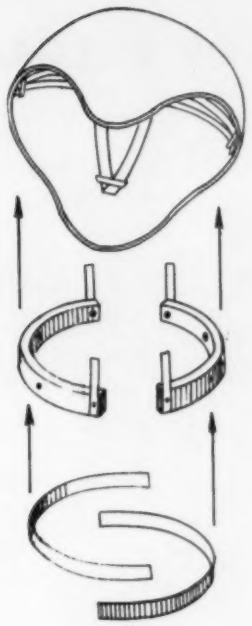
4) Thigh and knee pads of CAL "beam pad" design; i.e., with sponge rubber padding "tied" into the fiber shell to give a better distribution of force and to bring into action a larger volume of padding material to absorb the blow.

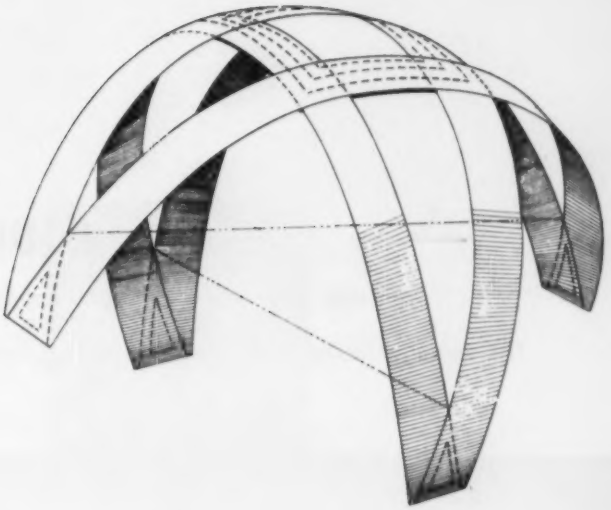
5) Shin pads, light fiber with cane ribbing. Not mentioned by the CAL. Pros are also required to wear high stockings.

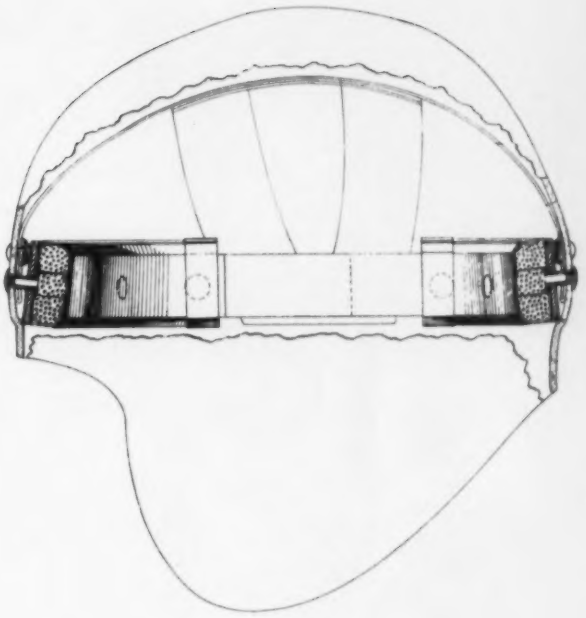
6) Football shoes, usually of the lowcut variety. The CAL's Traction Ring Cleat, a lightweight aluminum ring which was supposed to take the place of standard cleats (in order to eliminate their sometimes-dangerous locking action), proved to be impractical under game conditions. They were insufficient for sharp cutting and broken-field running.

By the time the typical Giant finishes suiting up he may be wearing anywhere from eleven to twenty pounds of equipment, if you add to the above list such items as pants and jersey, T-shirt, socks, athletic supporter and metal cup and, quite possibly, a knee, elbow or shoulder brace (or all three). It is one of the ironies of the modern game, however, that with all the emphasis on the development of new equipment and with all the money being spent on it, the players themselves are constantly cheating on the amount of equipment they are supposed to wear. They do this not out of carelessness or ignorance but out of the game's ruthless demands on them for speed and more speed. By shedding such pieces as rib pads, shin pads and even hip pads, they leave themselves open to serious injury, but this is a chance many of them seem willing to take.

It is clear that existing football equipment is still far from the answer to some of the most crucial needs of the game as played today. Although a variety of forces are at work to make the game safer, there is at present no satisfactory







*C.A.L. scientists studied movies of games to determine how injuries occur and then—in the lab—leveled bruising blows at every piece of equipment to test its protection power. They found that while top of most football headgear was strong enough, sides and back were only about* 1/300th *as stiff as average human skull. A blow in this area will "bottom" (dent in) onto a player's head, causing possible brain concussion. New CAL-based helmets are built to withstand a* 2,000*-pound-per-inch blow; the helmets are constructed to hug skull so they will not fall forward over eyes or turn on contact.*

clearing house through which the accumulated findings of scientists, human engineers and safety engineers, coaches, trainers, medical men and those pragmatic researchers, the players themselves, can be communicated and exchanged. Football will never be made as safe as baseball, but there is much to be done to make it safer than it is.

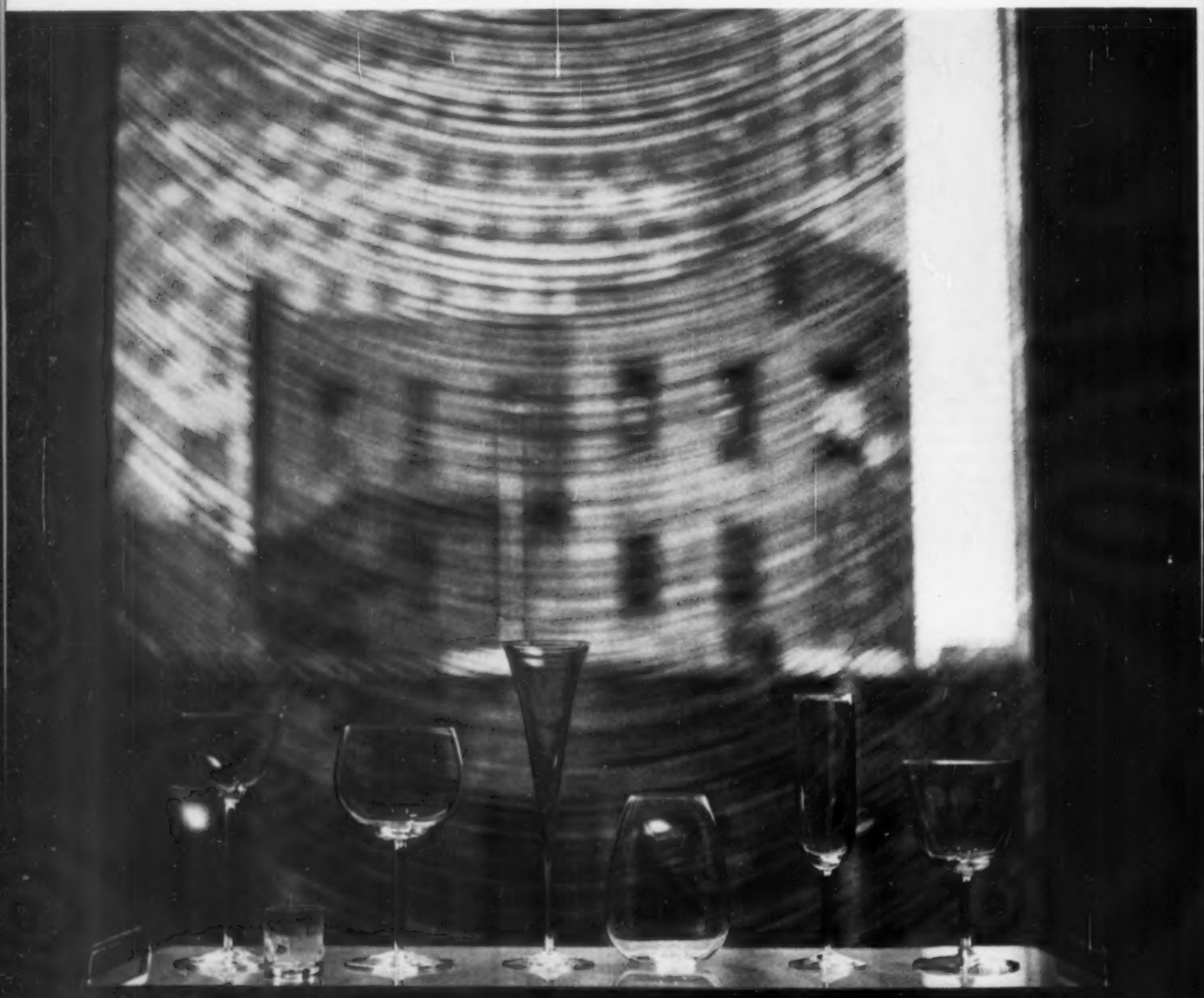
There is a general distinction between the kinds of equipment called for by these two sports that may help explain the design emphasis. Baseball is a precision sport, and the basic tools necessary for its practice are precision tools: gloves that can pick up split-second grounders, bats that can extend the batter's sensitivity to the point of striking a tiny sphere moving at great speed through a highly restricted zone. Football, despite the development of both forward and lateral passing, is, like war in the good old days, more a matter of massing force against force—and where force is the issue, protection, rather than accuracy, is the design principle.

Whatever the emphasis, however, it is likely that game improvement in both football and baseball will depend very largely on progress in equipment design.

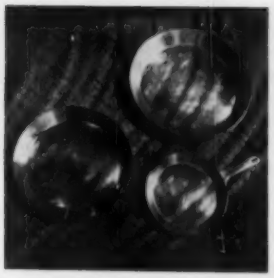
# EQUIPMENT FOR ELEGANCE

*has been designed in abundance by a husband and wife team to match*

*the decor, cuisine, and intended reputation of one of the world's fanciest eating places*



All photos by Mei Lou Foo



*COFFEE SERVICE on Saarinen table uses simple reverse shapes for sugar and creamer. Salt and pepper are half spheres in heavy silver plate, with hinged cover for fresh-ground pepper.*

*SUZETTE PANS, part of the family of silver-plated serving cookware.*

*SERVING POTS and pans, straight-sided and silver-plated designed for a "classic" cookware look, have stacking covers for storage.*

There was nothing conventional about the design assignment given to Garth and Ada Louis Huxtable for The Four Seasons — New York's monumentally impressive new restaurant in the celebrated Seagram Building. Nor does the story of this job make a conventional case history. In less than nine months over one hundred items were created — including complete sets of china, glassware, and silver-plated hollowware—to meet unusual concepts of food service which, in turn, were especially developed to contribute to a rare atmosphere of high living and *haute cuisine*.

Restaurant Associates, the corporate owner and creator of The Four Seasons, is a remarkable organization even among restaurateurs, and, the Huxtables found, a remarkable client. Its executives are young—under forty; and its operation is informal—meetings included unscheduled visits from chefs with samples of pastries or impromptu demonstrations of the preferred way to press duck. Their contract for the Seagram Building space meant working with Philip Johnson, guardian of the building's design integrity (and designer, with William Pahlmann Associates, of the restaurant) and meant setting a design goal for accessories and equipment that would match the *avant garde* elegance of the surroundings. The Huxtables, who were called in to help solve this problem (and who work as a husband-and-wife design team when Mrs. Huxtable is not writing architectural history or criticism), found there were no existing models for what they, or Restaurant Associates, wanted.

The Four Seasons was conceived as a unique dining experience. The idea was to spare no expense in titillating the customer's senses: he is exposed to paintings and sculpture by Picasso, Miro, and Lippold; he orders from a wine list and menu which offer an extraordinary variety of tint and texture, as well as taste; and he is served his meal in silver, china, and crystal specifically designed to implement the esthetics of food presentation — its color, display, and arrangement. These pleasures are compounded four times a year by seasonal changes in cuisine, service, planting, decor.

While executive chef Albert Stockli devised new dishes and vice-president Joseph Baum considered ways to dramatize their presentation, the Huxtables worked against time to produce a comprehensive variety of pieces—from service wagons to snail heaters—aided by purchasing director Lee Jaffe, who assisted them with an encyclopedic knowledge of supply sources and the particular problems of restaurant operation; and by president Jerome Brody, who resolved culinary and esthetic crises. The result of this collaboration is a group of coordinated accessories which the designers feel mirrors the distinctive character of the restaurant and is easily identified as The Four Seasons' services. In this they are supported by the Museum of Modern Art, which has chosen eighteen of the items for its permanent design collection. For the Huxtable's own account, turn overleaf.

*CHEESE SERVING TRAY, white carrara oval in a silver-plated frame; one of the Museum of Modern Art selections.*

*FOLDING TRAY STAND, surrounded by serving ovals, which range from a 7½" gratin to a 24" casserole.*

*A SAMPLING of The Four Seasons services: steak tartare board with condiment clips, chafing dishes, serving pots and pans. Seasonal symbols by Emil Antonucci appear on small pieces.*

*by Garth and Ada Louise Huxtable*

Our job was to translate the unusual food and service requirements of The Four Seasons into equally unusual accoutrements that would match the simplicity and elegance of the restaurant itself, and to do so in an incredibly short time. It was a designer's dream and a designer's nightmare.

Our opportunities were unprecedented. Not only had the architects set a design standard that gave us particular pleasure, but a creative client provided the chance to develop new items, or new solutions for traditional ones, unrestricted by conventional attitudes (or budgets!).

At the same time, the problems of schedule and production were formidable. The list of individual items used by a luxury restaurant is a long one. Although the number required of each item is considerable, in many instances it fell far short of mass production quantities, so that every effort was made for the utmost efficiency of fabrication as well as simplicity of design. Because of the crash program, there was rarely time for a prototype model that could be tested for faults. We worked from design sketch to finished product as fast as possible, and in some cases our prototype disappeared before approval—only to turn up later in the test kitchens. Our meetings lasted long into the night, and occasionally (ironically, with such a client) without a break for dinner.

Many of the requirements called for ingenious solutions within the stringent limitations of time, material and production methods. Sauce pots, for example, were designed with captive covers controlled by a small lever pivoting from the pot handle. These covers cannot fall off, but may be easily removed for cleaning.

Glasses (page 78) were studied individually, with distinctive shapes developed to enhance each wine and beverage, including two special champagnes. A basic character maintains their harmonious relationship. Although the glassware is of course heavier than domestic ware, it is much lighter than normal restaurant weight. The simply-designed china is also unusually lightweight for restaurant use, without the customary rolled edges, and with many unconventional items —stacking tea and hot water pots, oval butter and vegetable dishes, covered demi-tasses.

The hollow-ware, of silver-plated nickel silver for maximum richness and durability, is a design that suggests classic cookware, developed in a wide variety of shapes and sizes for table service: round pots, pans, skillets; oval gratins, casseroles and platters. Separating covers—simple flanged disks—allow the straight-sided pans to stack, with only the serving covers having curved contours and silver tips.

Some special items never leave the kitchen: an adjustable rotisserie cage for beef ribs, a heater-dispenser for serving snails. Other items—a novel flambé sword, a game skewer stand, and additional service wagons—are still in the experimental stage until the time comes when a menu change may require their use.

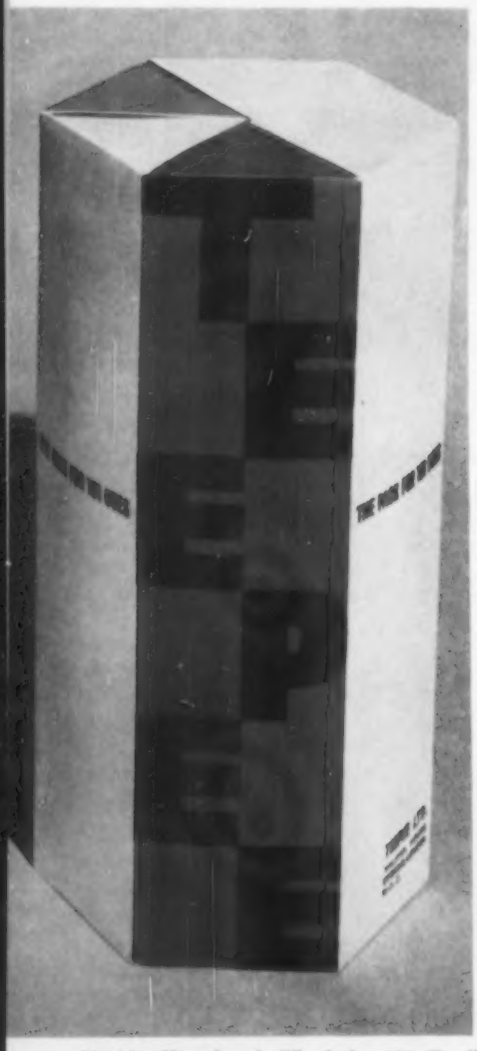
*CHINA, which emphasizes simple shape and warm ivory color, is thin-edged, like domestic ware. Rims of plates and sides of cups and bowls are straight-lined, clearly defined.*

*STACKING POT for tea and hot water maintains straight-lined design, carried through all china pieces even to cup saucers.*

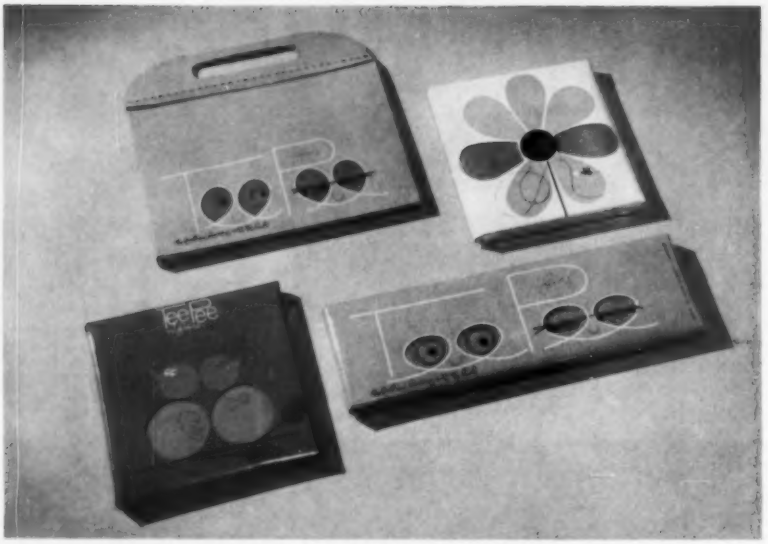
*FOOTED BREAD STAND, a signature piece of the restaurant, stays on the table at all times. Different liners adapt it to petits fours or fruit. The smaller bowl is a matching supreme service.*

# PACKAGES WITH NO STRINGS ATTACHED

*A British converter displays results of carte-blanche package design commissions granted to six designers from different countries*



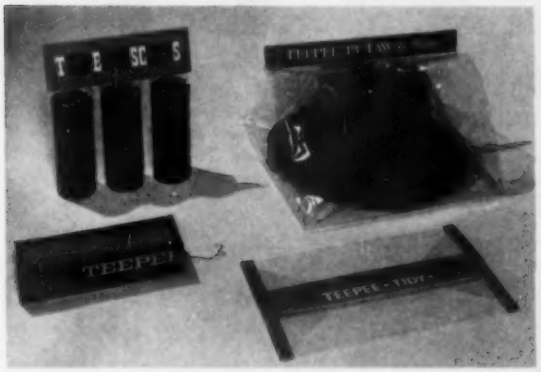
*Yusaku Kamekura's "Pack for 101 Uses" can be produced in any size.*

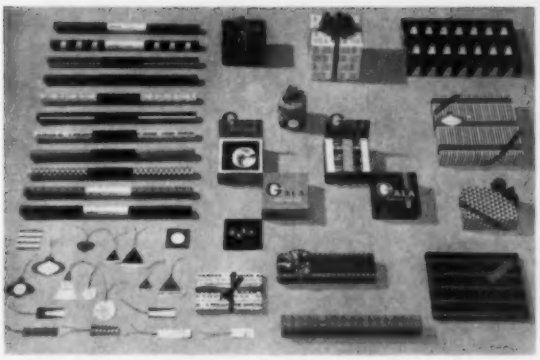


*Group of nylon stocking packages by Saul Bass.*

*Coordinated range of designs for imaginary store by Olle Eksell (Sweden).*

*"Putaway" bag and yarn pack-dispenser by Fritz Bühler (Switzerland).*



*Variety of "Gala Giftwraps" for year-round use by Britain's W. M. de Majo.*


*Assortment of bags for apparel and stationery by Italy's Alberto Steiner.*

American package designers, who sometimes feel that management's commercial requirements are strangling their individual creativity, will find a breath of fresh air in a piece of news from England, where a packaging manufacturer recently commissioned six prominent designers from six different countries to do virtually anything they liked in the way of new package design.

Transparent Paper Limited, Europe's largest converter of cellulose film, granted the commissions to Saul Bass (U.S.A.), Fritz Bühler (Switzerland), Olle Eksell (Sweden), Yusaku Kamekura (Japan), W. M. de Majo (Great Britain), and Alberto Steiner (Italy). The company asked the designers to "design for forward thinking" and to "create packs which both graphically and constructionally will ensure visual impact and protection." The only stipulation was that the company's own products, DIOphane cellulose film and DIOlam cellulose film laminate, be used in the new designs. The results of their work, shown on these pages, were featured in Transparent Paper's display at the September Packaging Exhibition in London's Olympia.

In addition to promoting its own products, the company intended with this display to show "that packaging design has come of age, and that it is no longer a haphazard operation, but one best left in the hands of experts . . . that close cooperation between designer and manufacturer is the only way to ensure best results for the customer."

Notable among the designs presented is Bass's group of nylon stocking packs (opposite, top right), which consist of die-cut white lined chipboard blanks and reverse-printed DIOphane. The hand-bag pack is in film laminated board, folded and stitched, leaving the front free to snap in and out like a bookmatch cover.

Although the designs presented offer a variety of original packaging ideas, it seems clear that no "radically new concepts" emerged from this unusual experiment, perhaps because no demands were made. Furthermore, while the designers represent six different countries, the graphic elements of their designs convey no distinct reflection of the particular cultural conditions in which each designer lives and works. If you look at these packs long enough, you may discern a typically American sense of humor in Bass's use of the imaginary product's motto ("the fashion with the look") as a caption for the cartoon-like pictorial motif of the male eye ogling his coy mistress. Similarly, a certain English quality of tidy elegance may be attributed to the "Gala Giftwraps" of W. M. de Majo (above)—but these slight individual differences are lost in the much stronger similarities among these six designs, which, on the whole, tend to level national differences in style to a relatively uniform expression. But then it *is*, of course, one world.—*R.M.*

# DESIGNERS UNDER THE ELMS

*IDI's New England Chapter meets in rustic Connecticut setting to discuss problems ranging from the global conflicts among nations to the emotional conflicts of designers*

*Cousins*

*Bach*

*Watts*

**Speakers**

NORMAN COUSINS
*Editor,* Saturday Review
RICHARD F. BACH
*Educational Advisor,*
*American Institute of Decorators*
W. WALTER WATTS
*Group Executive Vice President, RCA*

**Panelists**

DR. WILLIAM B. TERHUNE
*Associate Professor of Psychiatry,*
*Yale University*
WILLIAM CAPITMAN
*President*
*Center for Research and Marketing*
JOHN GRISWOLD
*Vice President*
*Griswold, Heckel & Keiser Associates*
ROBERT REDMAN
*Chairman*
*Department of Industrial Design,*
*University of Bridgeport*
JOHN PETER
*President, John Peter Associates,*
*Designers and Editorial Consultants*

All photos by Leo Privato

Not everyone knew exactly what "Polydirectional Horizons" meant, but as the theme of the sixth annual symposium conducted by IDI's Southern New England Chapter last month it had, as one speaker observed, some of the characteristics of a good industrial design: it was new, a little strange, and altogether enticing. In keeping with this theme—which was enticing enough to bring a large number of polyminded designers to the elm-shaded retreat of the Silvermine (Connecticut) Guild of Artists, where the conference was held—the speeches of the day covered a polyvariety of subjects.

Norman Cousins, Editor of the *Saturday Review,* sounded the key-note of high seriousness which marked much of the day's discussion with a fresh appraisal of the changing nature of the contest between the Soviet Union and the U. S. After describing the "new look" in Russia today, where, he reported, an emergent class structure is replacing the Marxist ideal of a classless society; where progress in meeting consumer needs is replacing the Stalinist emphasis on the exclusive development of heavy industry; and where science and technology have moved far beyond that primitive state in which Americans like to think they are stuck, Cousins went on to exhort American businessmen and State Department policy-makers to realize that the problem is no longer that of a military Iron Curtain but of an economic "Red Magnet." Lest we see half the world drawn to it and away from us, Cousins declared, we must not only accept Krushchev's disarmament proposals promptly, but must regain the initiative by commencing a much more elaborate program of economic assistance to under-developed countries.

Richard F. Bach pleased listeners by predicting that "in industrial design ultimately there will be a revelation of genius." Urging his audience to prepare for the event, Bach voiced a vigorous appeal for professional purposiveness and unity. To make each of his designs a contribution to the expression of his individual talent is a designer's purpose, Bach said, and in this purpose consists the "morality" of his profession. On the question of unity, which he (like most of his listeners) considered one of the more pressing needs of the profession, Bach declared that "some way must be found to unify the IDI and the ASID," to "join them both in the moral cause of industrial design." He recommended a common meeting of the two organizations. "The two roads must merge somewhere," he concluded, "or you'll never come out on a highway."

While the designers were digesting this substantial diet of theory concerning the survival of their country and the morality of their profession, Gen. W. Walter Watts discussed the more concrete matter of the role of the industrial designers in the development of RCA's new electronic computer (reviewed on page 53). Claiming excellence for the product, he said it was "the result of our designers' being included on the project from the earliest possible moment."

*George Goshco, Conference chairman*

*Dr. Terhune*

*The afternoon panel session, true to the stated theme of the conference, flew off in many directions. But it never quit the subject at hand, which was, of course, the industrial designer himself. Under discussion were such diverse matters as: the emotional life of designers, their artistic integrity, their education, and their relation to the consumer market.*

*John Vassos (left) and Robert Redman (right) presenting Richard F. Bach with a special SNE Chapter award in recognition of "his continuous inspiration and dedicated service to the profession of industrial design."*

**Dr. Terhune:** In our contemporary culture most Americans have no personal design for life, no way of life based on premises in which they fundamentally believe. Therefore, most of them do not live free lives. They do not enjoy a self-disciplined freedom. They more or less live under a mass discipline, so-called freedom. What is the basic conflict which handicaps our best brains? The conflict is between integrity and materialism. Life in this age of mass production puts an added burden on the emotions of the artist. More than ever before the artist needs a design for life that will withstand these conditions. Some examples of our contemporary art and design reflect the schizoid and unbalanced state of mind of some artists. These designs represent the unfinished business of a group of tortured minds. There are two types of drawings as we study them: the schizoid drawing and the manic designs, shall we say, of our modern automobiles. We are sure they were designed by a manic temperament: bigger and better?—well we won't say any more about that!

As industrial designers your job is to create new, beautiful patterns, reconciled with the economic necessity of selling them to the public. So you are faced with a question: is a piece of bread in one's pocket better than a feather in one's cap? A world-renowned artist once said, "The public has always in every age been badly brought up." They continually demand art to be popular, to please their want of taste, to flatter their vanity. It is the task of the artist to improve and mold their taste. Human beings basically love the beautiful, the sublime. But they must be led by the artist. You must help guide the esthetic direction of our culture in relation to consumer goods. That, I think, is a large part of your mission, and you must be tough to accomplish this.

Life is full of reciprocal concessions, and the modern artist does not escape

*Griswold*

*Redman*

*Capitman*

*John Peter,*
*Panel moderator*

them. It is not possible, if you wish to survive, to consider art only for art's sake, to the exclusion of these compromises. But it can be done with integrity remaining intact. You know, but most people do not, that design and art are in themselves a language. If the designer wishes to converse and speak to the people clearly and understandably, then he must order his own life so that his mind is free and uncluttered with unresolved conflicts. Needless to say, designers above all people must love their work. When this is true, life has a way of transcending the pressures, a way of permeating the actual labor to such a degree that it weaves itself right into the fabric of design.

**Griswold:** I don't mean to be a predictor of gloom, but we should recognize that our materialistic culture presents a situation which the industrial designer must face, because it might force him to compromise his artistic honesty. Now most of us can't really implement at every occasion this artistic honesty. We've got to eat, we have to be paid by an employer, and so on. But we're talking about ideals. Unless we have this purpose and ideal, we might be forced to compromise our artistic honesty, in this mass of materialistic manufactured volume. What is the objective, then, of an industrial designer? What is his purpose? Our objective is for recognition as professionals. We have to win respect for ourselves and for the fee that we charge. It's as simple as that.

**Redman:** What we are trying to do at Bridgeport is to turn out flexible nonspecialists who have a basic approach and who, with a reasonable break-in period, can fit into any good office. We are trying to get versatile people who are not tied down to a particular way of handling a design problem or of presenting a design solution. We are naive enough to think we can teach our students to think a little bit. We are trying to give our people a sense of discrimination, the ability to note and do something about the small differences that make the difference between a good design and a poor one. We believe that the student who graduates is *ready to become* a designer.

**Capitman:** In my opinion it's not true that there is anything filthy about an artist engaging in commercial work. It's a normal part of human behavior, except perhaps for the rare genius who can operate more effectively in an ivory tower. But for most artists the stimulation of the market place is more likely to be conducive to creativity than against it. In fact there is not likely to be anything more stultifying than design for design's sake. The function of a design is a human function and not an abstract one.

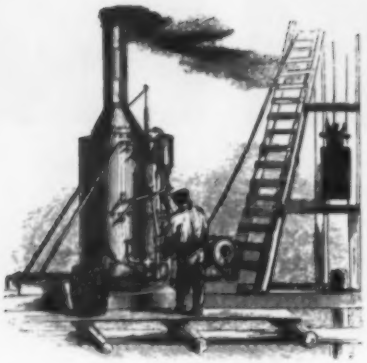
I think the whole question of functionalism needs re-examination. There is a strange trend in design and architecture to think of functionalism as being dictated by materials and things rather than thinking of the sphere of human activity into which an object or building fits. Human needs are not merely physiological. Designers need particularly to realize that people have esthetic, social, and emotional needs which are every bit as important as the physical desire for comfort. Park Avenue as it is developing is almost a classic example of an inhuman definition of functionalism. When Lever House stood alone its classic simplicity, its uniqueness, were in themselves desirable qualities and gave people pleasure. But today Park Avenue is becoming a monument to starkness and to cold inhumanity. Basically these misinterpretations of function occur because designers are not availing themselves of the opportunities that exist for finding out what people want and need.

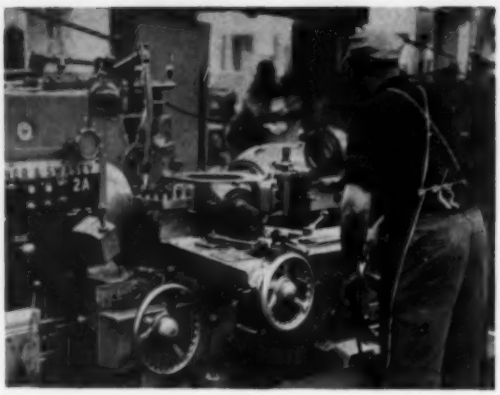
Mr. Watts spoke of the development of a new electronic computer in which a designer played an important role. RCA would never think of putting a machine on the market if it had not been demonstrated in advance that it would work. Yet the company was content to work on the designer's hunches as to how well it would do its job from the standpoint of satisfying the consumer's esthetic and emotional needs. In the area of engineering nothing was left to chance, but in the area of design, everything was left to one designer's ability to guess that his design solution was correct.

Design market testing procedures available today may not be as accurate as engineering measurements. But they offer an enormous improvement over guesswork. And this doesn't mean that social scientists would rob a designer of his creativity. On the contrary, the richness of human experience and the sensitivity of the human mind provide new opportunities on a human scale.

What the researcher does for the designer is to interpret the inherent meanings of a product as it is felt and seen by people. In this the researcher broadens the range of esthetic directions for the designer, who would otherwise (by contrast) have only his own narrow experience to go on. He has a greater leeway to pick and choose from the associations and feelings of many people, rather than the arbitrary confinements of pure esthetics. At the same time, he has the aid of the research in selecting from many alternatives that which is most germane to the meaning of the product to the people who will use it.

In all this, one must remember that the researcher is not telling him what or how to design, but rather interpreting for him what his design must accomplish. The superiority of the designer's creativity, his intuition, if you will, will be displayed by how effectively he can fill these demands upon his art. It is, after all, possible for creativity to flourish when a patron makes demands of a very definite sort. One need only to point to religious art as the prime example.





# ADJUSTING THE MACHINE TO FIT THE MAN

*Latest thinking in human engineering attempts to devise a means of applying human factors knowledge to the design of machines and other products*

On the glittering new kitchen range, pots are boiling over, billows of steam are rising from the burner, flames are licking up out of a roaster, the glass door of the oven is opaque with soot; at the rear control-panel, lights are flashing red, green, and yellow; dials are spinning, counters ticking, bells ringing, alarms buzzing. The disconcerted housewife turns helplessly to her puzzled husband, saying, "It's trying to tell me something, but I don't know what!"

Such was one cartoonist's caricature of a consumer product designed, apparently, to baffle the person destined to use it; for whatever chromium-plated virtues this range may have had, it was clearly not designed for facility of operation by its prospective operator. That is to say, it was not human-engineered.

The term, "human engineering," has several different applications. For some psychologists it designates a process of aptitude testing and measurement by which they determine what kind of work-tasks a man is best capable of performing. For naval aircraft-control officers it is a term applied to certain knobs on their radar-scopes. They are told in training school that these knobs, whose different shapes permit the operator to use them accurately in the dark compartment in which the radar scopes must be housed are "human-engineered knobs." For philosophically-minded devotees of good, old-fashioned individualism, human engineering (whatever it may mean) may loom as a portent of the dehumanization of mankind. They may see in human engineering the ultimate subjugation of man to his machinery. Human engineers themselves, however, are convinced that their work helps man gain dominion over his machines — or at least to keep up with them. So the question is whether the operator of the primitive steam-driven pulley, above left, is more or less a "slave" to his machine than the mechanic, right, operating a modern Warner-Swasey lathe.

Among designers, human engineering is perhaps most widely thought of as a department of common sense: the application of some fairly obvious facts about human beings to the design of machines and products which human beings must operate and use. One of the dangers in regarding human engineering as "just common sense" is that it leaves the designer free to take it or leave it. Our cartoonist's kitchen range was a burlesque of the designer who chose to leave it. Another danger is that, if human engineering is a question of common sense, the designer is free to feel he already knows everything there is to know about the subject. For, as Descartes once pointed out, common sense is one of those very few highly-prized commodities whose supply exceeds demand, since everyone is certain he already possesses as much of it as he needs. Yet, while there is just enough truth in the common-sense view of human engineering to make it plausible, there is not quite enough to make it entirely accurate.

It is plausible because designers are continually finding good solutions to design problems on the basis of what—to them, if not to the man in the street—is simply common knowledge. Without the slightest researched statistical information about the range of human body dimensions, a designer can still come up with a fairly adequate chair for

people to sit in. The common-sense view is plausible, too, because behind it stands the long tradition of its proven service to man. Up till a few decades ago, and possibly yet today, European peasants constructed their agricultural tools according to an elaborate system of "natural measurements" based on hand-widths, arm-lengths, finger-spans, etc., so that in using an implement, they might make the most efficient use of their own personal physical capacities.

### New knowledge of men and machines

But common sense is no longer adequate to the task; it no longer brings enough knowledge or experience to a problem in modern design. In the design of an airplane cockpit, for example, there is not room enough to be inefficient, or money enough to be careless of costly equipment. And in the design of complex instruments there are too many variables for a common-sense approach to handle with perfect efficiency. The airplane is the classic example here, because scientific human engineering began during World War II when the need for a more efficient cockpit than anyone was yet prepared to design sparked tremendous programs of research into the capabilities and limitations of human beings in complex work situations. Guesswork was replaced by very precise answers to such questions as: what kinds of typefaces and dial-readings is a man capable of reading most quickly and most accurately?—what kinds of sound signals can he best discriminate among and understand?—what is his conditioned reaction to the colors of indicator-lights?—what kinds of motions can he perform most easily?—what ranges of temperature, humidity, air-pressure, and vibration can his body tolerate?—how far can he reach?—how low can he crouch?

The result of this research was not only the development of more efficient airplane control equipment, but the accumulation, also, of a vast body of new knowledge about the relationship of men and machines. However, this prodigious amount of information about the capabilities and limitations of human beings in work situations leaves the industrial designer faced with the problem of picking and choosing whatever data happen to be relevant to the particular design he is working on at the moment. He is also left to his own untrained resources to determine what information, of all that is available, *is* relevant. The literature on the subject does not provide him with a method of determining what information he needs and then of making most effective use of this information in the solution to *any* design problem.

One recent attempt to supply this need is based on a concept of the man-machine system as an organic unit, in which the machine is made to respond to the capacities and limitations of the operator.

The man-machine system concept is predicated on a simple and (once stated) rather obvious breakdown of the basic relationship between any machine and its operator. This relationship consists of five sequential situations, in which there is (with examples):

(1) reception of information by the operator (*traffic light blinks green; policeman blows two shorts on his whistle*),

(2) a decision by the operator (*to proceed*),

(3) action by the operator (*shifting to first, simultaneously releasing the clutch and depressing the accelerator*),

(4) functioning of the machine (*car goes*),

(5) feedback (*high pitched sound of engine, speedometer reading of* 15 *mph*) and continuing control by the operator (*shifting to second, etc.*)

This analysis of any man-machine relationship (and it holds for a seamstress at her sewing-machine as well as for a mechanic at his lathe and a pilot in his cockpit) should not be hastily dismissed because of its deceptive simplicity; for it provides the basis of a carefully analytic approach to design which places primary emphasis on the adaptation of the machine to the abilities of the operator, rather than bending the operator to fit the machine. Human engineers regard such an approach to design as the best means of achieving maximum efficiency, comfort, safety, speed, and accuracy in the use of products and the operation of equipment.

### Five-phase approach to design

This approach itself may be broken down into five phases of which the first is a statement of the goal or objectives of the system. This again is deceptively simple, because while the statement of a problem always appears easy, the solution of the problem depends on the accuracy of the statement. It may be put in an infinitive phrase. For example: "to translate, automatically, vocal statements into writing." (This happens to be one of the problems computer engineers are at present working on.)

Second, in terms of this statement of objectives an analysis is made of the man-machine relationship. This consists of a complete listing of the *decisions* which the operator or machine must make, of the *information* he will need to make these decisions (information originating either in the machine itself or in other machines or other people) of the *actions* he must perform to carry out these decisions, and of the *general conditions* of the work situation (including environmental conditions—temperature, humidity, illumination, vibration, etc.—and characteristics of the prospective operator).

The third step consists of separate studies of each human factor in the man-machine relationship. Without considering the relative importance and priority of all the human factors (this comes later), the designer here attempts simply to determine what kinds of components of the system will be

best suited to the capabilities and limitations of the prospective operator. The number of questions to be answered here depends on the nature and complexity of the objectives of the system. For example:

—How should the operator receive a piece of information, visually or aurally?

—How shall this information be displayed to him? If visually, by what kind of display (meter, dial, light, etc.)? If aurally, by voice or sound signal?

—What is the optimum location of this informational display?

—What type of controls will be best suited for a particular action? What would be its optimum location?

—What is the optimum location of the operator?

And so on *ad infinitum*. It must be stressed that these questions should be answered in terms of the abilities of the operator, rather than in terms merely of the functional requirements of the machine; for the chief idea behind this approach is that the abilities of the machine can be manipulated while those of the operator cannot.

This third phase is crucial, for it is here that the designer may be most tempted to depend on common sense, while it is right here that common sense has been superseded by a great deal of precise knowledge on the subject.

Knowledge of human factors, as they figure in the design of equipment and products, falls into five broad categories of human capabilities and limitations: (1) vision, (2) hearing, (3) motor activity, (4) body dimensions, and (5) physical tolerances. Each of these areas of *human* characteristics corresponds to one of the *technological* elements of design: (1) visual display of information, (2) auditory communication, (3) controls, (4) component and work-space arrangement, and (5) environmental conditions (e.g., temperature, humidity, illumination, pressure, vibration).

#### New emphasis in research

Not all the research in these areas is new, of course. The nature of human vision and the theory of optics, for example, have been subjects of study literally for centuries. But where research is not new, it has taken on a new emphasis. Human engineers and applied psychologists are concerned with the theory of vision and optics (to continue with the same example) not only in order to determine how people *see*, but in order to find out how they *read*—not in order to fit them with spectacles to help them see better, but to devise visual displays which they will be able to read, and act upon, with maximum efficiency, accuracy, and speed.

Now, to indicate the scope of this third phase of the design solution, suppose that the question, "How should the operator receive a particular piece of information, visually or aurally?", has been answered; that for such-and-such reasons the designer decides to employ a *visual* display of information. When he asks himself the next question, "What kind of visual display will best convey this information to the operator?", he is plunged into an ocean of facts and figures concerning the nature of human vision and the possible uses and relative effectiveness of a variety of types of visual display. For a great deal of research has been carried out in this field, and a great deal of information about the problem of vision and visual display, some of it theoretical, some of very immediate application, is available to the designer. Following is only the sketchiest outline of the scope of the subject:

#### How human vision may affect design

First of all, there are several aspects of vision which affect reading ability: visual acuity (the ability to perceive black and white detail at a distance), convergence (the process of focusing both eyes on an object), depth perception, color discrimination, and dark adaptation. Second, visual acuity itself has been found to be subject to variation by several factors: the level of illumination, the length of exposure time, the difference in brightness between — for example—the numbers on a dial and the dial itself, the difference in brightness between the dial and the surrounding area, and the amount of glare.

Third, instruments may display information in three different ways: quantitatively (as in the numerical readings of a thermometer), qualitatively (as in the deviations from normal indicated by an automobile temperature gage, which generally reads "hot—normal—cold"), and in the form of check-readings (as, most simply, in the on-or-off condition of an electric light switch).

Fourth, of all the possible types of visual-display instruments—the dials, pointers, counters, lights, etc., with which designers are familiar — certain ones have been found to be better than others for a particular type of information. Research has also revealed that within any one type of reading instrument (dials, say), certain design features (such as shape, type-face, needle position, etc.) make for easier, speedier, more accurate reading than others.

This knowledge, though at first blush it may look forbidding in its complexity, and though not all of it may seem relevant, can be of tremendous assistance to the industrial designer. It can save him the trouble of flying blind over a course someone has already mapped out—at least in part. Specifically, it can tell him what kind of visual display he needs for the particular design problem he is faced with. And ideally, if the designer assiduously pursues the answers to all the other human-factors questions which the third

phase of the design solution poses—questions about human hearing, motion, body dimensions, and physical tolerances, and the related technological problems of auditory communication, equipment controls, component and work-space arrangement, and environmental conditions (all of which are at least as complex as the questions of human vision and visual display)—then a design solution will not only be made easier, but should go further towards achieving maximum compatability of man and machine.

The fourth phase in a completely human-engineered design is the relating of all these human factors in a preliminary layout of the design. The third phase will have uncovered any number of conflicts in the relative importance of the various human factors, and between human factors, engineering, and design requirements. For example, the optimum location of a particular display of information may be found also to be the optimum location of a particular control instrument. Or the best location of this display may conflict with the necessary arrangement of circuitry and linkages behind the panel. For both cases, layout of the design will have to provide a compromise, and for this there is no pat solution. The need for cooperation between designer and engineer at this point is particularly obvious.

In the fifth phase of design, a full-scale prototype is developed, so that layouts may be checked against human factors, engineering, and design requirements.

### Human engineering and consumer products

Human engineering is a relatively new field of advanced technology, and as a governing concept in design it has so far met with only limited application. The reasons for this are obvious. The theory and practice of human engineering (considered as a scientific discipline) have not yet reached a stage of organization and sophistication comparable to that of other fields of technology—and perhaps they never will, since their subjects are human beings and not metals or electrons. Furthermore, while the man-machine system concept is patently the only basis for an approach to the design of complex equipment, it may seem to designers to be of little service in the design of ordinary products like household appliances. Human engineers claim that their discipline has reached a high level of sophistication, and that even for the simplest products the man-machine system concept provides the most fruitful approach to design. They argue that an approach to product design based on the total concept of the man-machine system will liberate the designer's thinking at the most fundamental level, and will provide him, not with a formula for solving each design problem, but with a means of determining the basic nature of any problem, and of determining the various alternatives by which a good solution may be achieved.

Industrial designers, whose work is necessarily pretty radical, but whose attitudes, when it comes to new thinking in their field, can often be strenuously conservative, have been quick to suspect a defined approach to human engineering in product design. Only a very few of them, however, are not aware of the importance of human factors in any design which people are ultimately going to use, and they will look forward to a practical substantiation of the fruitfulness of the man-machine system approach to the design of consumer products.

Overleaf is the first of a series of reviews of current designs illustrative of the growing emphasis on human engineering. Since Henry Dreyfuss early espoused the idea that "the most efficient machine is the one that is built around a person," it is appropriate that we begin with a new airplane passenger-seat designed by the Dreyfuss office and built around the people who are destined to use it.

### Basic Human Engineering Bibliography

**Surveys of Human Engineering Theory and Research:**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E. J. McCormick, *Human engineering.* (McGraw-Hill, 1957).


**Human Engineering Guides for Designers and Engineers:**


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W. E. Woodson, *Human engineering guide for equipment designers.* (University of California Press, 1954).

Alphonse Chapanis, *Research techniques in human engineering.* (Johns Hopkins Press, 1959).

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**Periodicals:**


*Ergonomics*, British quarterly, available through Academic Press, 111 Fifth Avenue, New York.

*Bulletin* (monthly) and *Journal* (quarterly) of Human Factors Society, available from Dr. John Lyman, College of Engineering, UCLA.

*New seat (left) for Lockheed executive's transportation plane, like its commercial-plane precursor (above), is based on long research into problems of sitting comfort.*

**DREYFUSS OFFICE HUMAN ENGINEERS A CHAIR FOR AIRBORNE EXECUTIVE SUITE**

Henry Dreyfuss does not pretend to be a human engineer, but, as anyone who has followed his career or read his book, *Designing for People,* knows, he has always been a strong advocate of human factors research in industrial design. Given his office's almost single-minded concern for the people who are destined to use the products it designs, it is not surprising that five years of anatomical study and seating research should have gone into the new Dreyfuss chair (above, left) for Lockheed's JetStar, an eight-passenger executive's transportation plane scheduled for first deliveries early in 1961.

The research on which the design of the JetStar is based was originally conducted for the purpose of designing standard passenger-seats for Lockheed's Electra jet commercial airplane. This seat (above, right) is currently in use only in National Airlines' fleet. The two seats shown above are vastly different in appearance and in some specifications, but the same seating principles which were developed out of research for the one have been applied to the basic design of both.

This research, conducted by Dr. Janet Travell, who teaches clinical pharmacology at Cornell and is Dreyfuss' consultant in matters anatomical and physiological, developed some theoretical criteria for a seat design whose object was maximum comfort for the widest range of human body-types. A set of dimensions for a chair that would meet these criteria was then established, and a mockup based on these dimensions constructed. To determine whether or not the dimensions for the chair actually satisfied the criteria of comfort previously established, two subjects, a man and a woman of average body sizes, were x-rayed in various positions in the mockup (opposite, 1 and 2). Further tests of comfort were conducted on a larger number of subjects representing a broad range of body-types. When these tests proved successful, the mockup was used as a basis for the dimensions of the two final Lockheed chair designs. While this procedure was not meant to satisfy all the requirements of laboratory science, it does indicate a more careful attention to human factors than is usually found in the design of such "ordinary" items as chairs.

Among the criteria of sitting comfort on which the final designs were based, some are particularly noteworthy, for they either establish new ideas in seating or contradict some commonly-held notions about chair design. The first of these requirements was that there should be a platform support for the buttocks, rather than a bucket-shaped bottom (opposite, 3). The theory was that if the weight of the body, sitting erect, is not borne chiefly by the two extremities of the pelvis (called the "ischial tuberosities"), undue pressure is put upon the thighs and buttocks, and this causes abnormal — and hence uncom-

fortable — muscular tensions in the lower region of the torso. This theory directly contradicts the idea behind a number of contemporary seat designs: that the bottoms of chairs should be shaped to the bottoms of people.

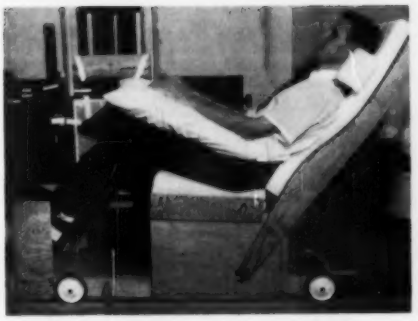
Second, research recommended that the seat-bottom should be low enough and short enough to place all the weight of the legs on the floor (right, 4). The reason was that the fleshy part of the thigh behind the knee is especially vulnerable under compression, since it contains some of the main blood vessels and nerves of the legs.

Third, the back of the seat should be contoured (vertically, but not horizontally) in order to provide support for the concave "lumbar" curve of the lower spine, to provide a recess for the convex curve of the middle back, and to provide flat support for the shoulder area. The reason for this is that unless the natural "S"-curve of the back is maintained, the body falls into an unnatural, and uncomfortable, posture. Moreover, it was found that the horizontal plane of the back of the chair should *not* be contoured, since a concave back (as is found most typically in the older kinds of theatre seats and in some contemporary designs) tends to push the shoulders forward, causing an uncomfortable compression of the lungs.

On the two Lockheed seats, maintenance of the spinal curves was achieved partly by contouring, partly by the use of variable-density plastic foams for the cushioning material — polyether in the Electra seat, and a combination of polyether and polyvinyl chloride foams in the case of the JetStar chair.

Other recommendations of research (some of them simply confirmations of the obvious) were: maintenance of obtuse angles at hip and knee joints, adequate arm and foot rest, allowance for a change of position, shaped support (in the form of a pillow) for the neck and head, and provisions for accommodating a range of body sizes.

Although the superficial resemblance of the JetStar chair to some other contemporary chair designs may be the first thing to strike the eye, Dreyfuss claims that it subtly incorporates a number of features which can be expected — over the long haul of a passenger's confinement to an airplane seat — to strike the buttocks differently. And not only the buttocks, but the head, neck, shoulders, back, thighs, and legs as well — in sum, all parts of the seated body which can affect the individual's comfort. And, further, not only a particular person's comfort, but that of virtually *any* person, small, medium, or large. As an objective in seat design this is a large order, and we shall have to await the reports of executives using the plane to find out whether it has in fact been achieved.—*R.M.*



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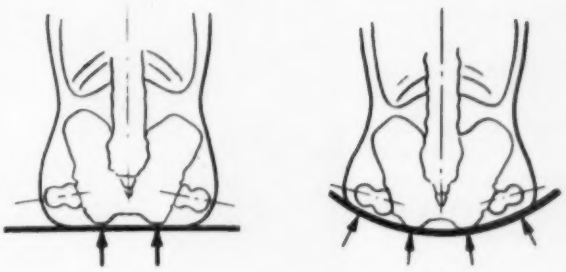


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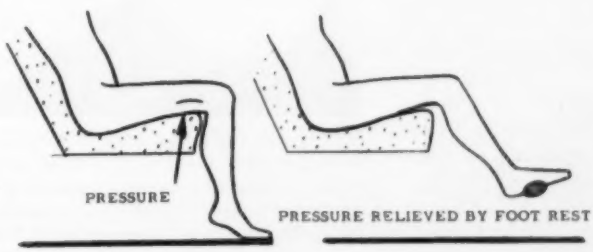


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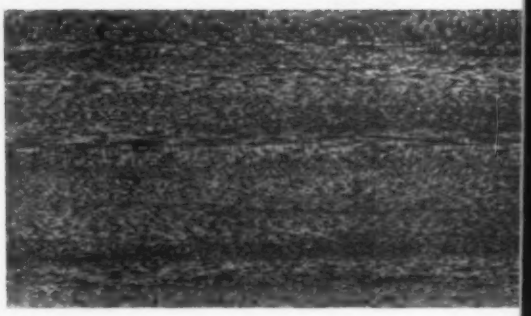
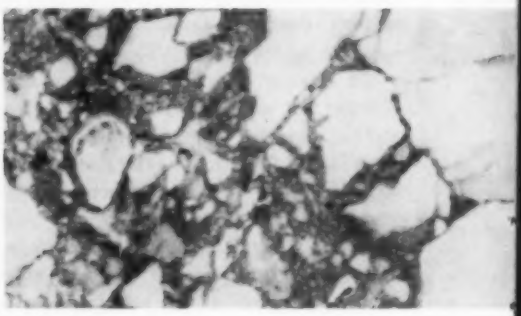
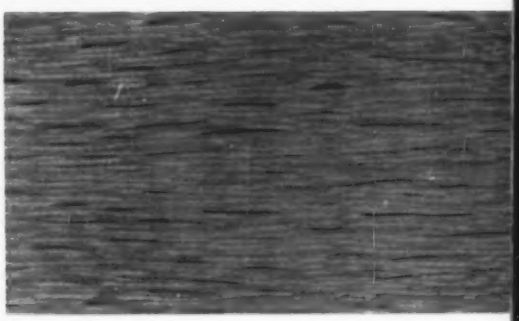
# PLASTIC-TO-STEEL FOR VARIETY'S SAKE







*At Enamelstrip Corporation, Allentown, Pa. the decorated plastic film is laminated to strips of steel up to 48" wide in a continuous process. At left, operator watches at point in production process of which roll-fed Videne is joined with chemically treated base material. At right, three types of surfaces of finished laminate.*

## *New Videne laminate's major asset is its surface durability*

A plastic-to-steel product, previously available only in sheet form for limited production runs, is now being produced in continuous rolls by a firm whose facilities were heretofore employed for the enamel coating of metals. The new product, called Miracoil, consists of a thin film of rotogravure-printed plastic applied to steel by means of a specially developed bonding agent which also contains background color. It is being made by Enamelstrip Corporation, Allentown, Pennsylvania, a division of National Steel Corporation, and uses a non-oriented polyester cast film called Videne, a Goodyear product, which is previously prepared and imprinted by Di-Noc Chemical Arts, Inc., Cleveland. Eventually Enamelstrip may also supply this new film bonded to other materials, such as aluminum or plywood.

Miracoil's special characteristics are its wide range of pattern possibilities, surface durability, and its capacity to be formed into many shapes without distortion of its pattern. Although these can be obtained in a wide variety, the patterns that reproduce to best advantage with the rotogravure process—a given pattern is engraved on a copper cylinder which then imprints it on the plastic—are those that simulate a wood or marble grain (see opposite page). Miracoil will probably be most widely used as a surface material for paneling, tv and radio cabinets, furniture, bread boxes, food trays, automobile instrument panels, etc.

### A prime advantage

The material's major asset, surface durability, results from the way in which the decorated Videne is applied to the solid, base material. Because the printed surface of the film is placed directly on top of the base material, the plastic-to-metal laminate uses the thickness of the plastic as a protective coating. This results in a very high scratch resistance, and also makes the material impervious to discoloring by heat or excessive light. Since it will not fade (even white will remain lastingly white) it can be used effectively on kitchen or hospital appliances.

Polyesters are thermosetting plastics and this property of Videne gives Miracoil good fabrication characteristics. The surface of the laminate will not "shrink back," therefore causes no distortions in pattern delineations. The material can be deep-drawn, lock-seamed, roll-formed, sheared, crimped, bent, pierced; but there are restrictions for fastening. Welding is harmful to the plastic surface, and no special welding methods have been devised as yet; but it is likely that suitable adhesives will in time replace heat welding. Miracoil can of course be fastened by mechanical joints.

### Production bottlenecks

Except for curing-temperature adjustments and base-coat application, the laminating process for Miracoil does not differ much from that for standard vinyl laminates produced in rolls on a continuous production cycle. (see ID November, 1958 for details). The base material (steel, aluminum, etc.) is fed from rolls through various stages of preparations to a point in the production process (opposite page) at which it meets the roll-fed Videne. The decorated film is bonded to the base material and the finished, laminated product is removed —again in rolls—at the end of the production cycle.

One serious problem confronted the Enamelstrip Corporation engineers in developing this continuous process. Coating the metal surface prior to the application of the Videne was difficult to control—uneven thickness of the coating had ill effects on the color tone of the laminate and made it impossible to produce the material without continued adjustments for thickness control; this of course hindered the process, and did not permit continuous runs. The problem was solved by combining a pigment with the base coat (the bonding adhesive) and by using the printed Videne in unbacked, clear form. A special adhesive had to be found and the addition of a compatible pigment gave Enamelstrip engineers a bonding mixture that yielded the base color for the decorative pattern.

The material can be supplied with one or both sides covered with Videne. Both sides can be covered in different colors with film thickness of .001, .002 or .003 inches; the current production rate is 300 feet per minute. Miracoil, produced in its present form only recently, is being used by Sylvania for the cabinet of one of their new tv sets, and is also being tested as roof panels in two buses.


### Pre-packaged rocket engine

A pre-packaged liquid propellant engine is being produced for two U. S. Navy rockets by the Thiokol Corporation. A packaged liquid rocket thrust unit is one in which liquid propellants and the propellant pressurizing medium are permanently sealed into a tank shell which fits into the rocket thrust chamber. The advantages of this method of rocket fueling have been known for some time, but only recently have the technical difficulties been overcome. Three main problems had to be solved to construct a workable pre-packaged engine. First, the propellant combination had to be one that would not affect the tank construction material; second, a compact energy source was needed to pressurize and expel the explosive propellants; and third, a strong starting device was needed.

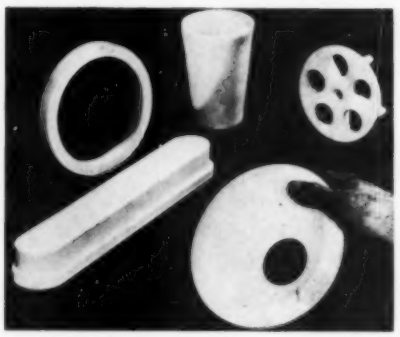
The problems were overcome by using a solid propellant charge to initiate the explosion, and an aluminum tank to encase the fuel. The rocket is fired by setting off the solid charge by means of the heat generated by electricity.

In the photograph at upper left, a workman is seen welding a stainless steel deflector for the Guardian I engine combustion chamber assembly. In the photograph at lower left, the Sparrow III missile is shown being fired from a McDonnell F3H Demon fighter. Both the Guardian and Sparrow missiles use these pre-packaged engines. The new engines can find their most appropriate use in missiles, because their detachability will permit last-minute repairs. Manufacturer: Thiokol Chemical Corporation, Bristol, Pennsylvania.

### Silica in shapes

A method of producing high purity fused silica in complex shapes and sizes not possible before, has been developed by Corning Glass Works. Fused silica, under the new process, can be formed into cylinders, domes, crucibles, rods and slabs—making possible sizes like those achieved by conventional ceramic forming processes.

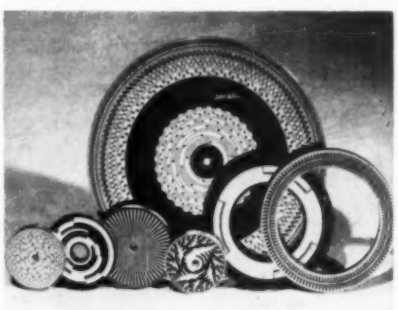
The material from which these shapes can be made is known as Multiform fused silica. This silica, of exceptional pureness, is extremely viscous and tends to sublime before it can liquefy and flow. The shapes are made by slip-casting or dry pressing.



The resulting opaque, fine-grained structure can be machined to tolerances of plus or minus .001 inches. Manufacturer: Corning Glass Works, Corning, New York.

### Improved flush-circuit

A newly-patented process for making flush circuits, by Scientific Components, Inc., is said to yield greater smoothness of surface than possible with ordinary printed circuits. In the new process the pattern representing the conductors of the circuit is embedded in a thin sheet of plastic in such a way (patented and not divulged) that dimensional tolerances can be kept to a very high degree. The metallic part of the flush circuit can consist of any metal which can be electroplated, including such precious metals as rhodium, silver and gold; epoxy,

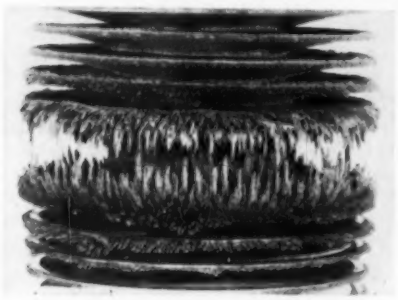


melamine, phenolic, polystyrene, and Teflon are applicable as the surface resins. This type of printed circuit is best used in applications where roughness of surface may prove to be critically disturbing to electrical performance. Some of these

applications are commutators, coding discs, emitter discs, switching plates. The holders of the new production patent also claim that use of this circuit will provide noise-free electrical action. The patterns can be provided in any size and pattern that the customer desires. Manufacturer: Scientific Components, Inc., 30 South Salispuedes St., Santa Barbara, California.

### Strainer traps iron filings

The development of a new Magnetic Sump Strainer to protect hydraulic equipment is announced by the Ripley Screen and Strainer Company. The strainer has built-in circular magnets placed between the removable filter disks in hydraulic systems. The result is a powerful magnetic field which traps iron filings. Much fluid in hydraulic systems contains suspended metal particles. These particles are too small to be filtered out. Since all fluid in the system must pass through the filter,

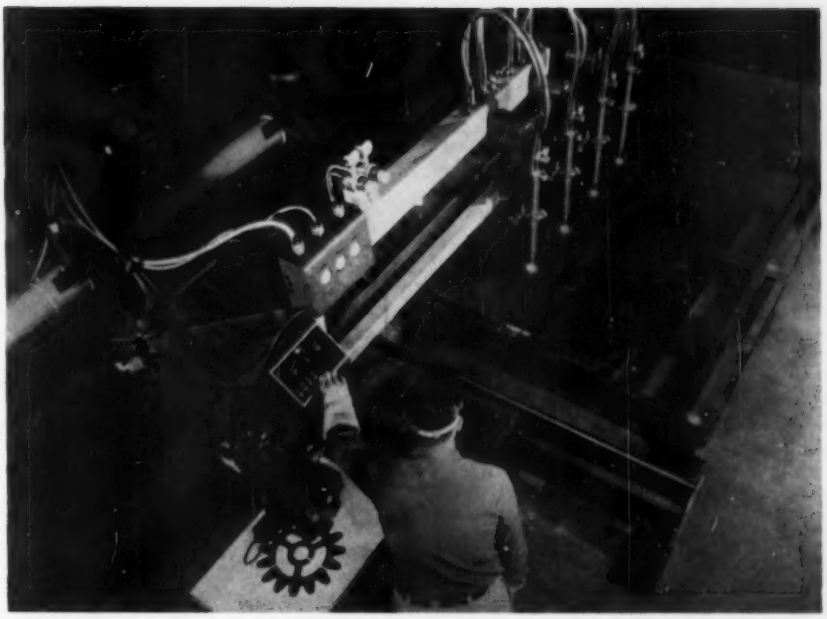


most metal particles will be strained out. In the photograph (above) the magnetic filter has collected a considerable amount of iron particles. The filter is equipped with screens to filter out non-magnetic particles also. Manufacturer: Ripley Screen and Strainer Company, Farmington, Michigan.

### Pantograph cuts steel

A machine which can cut steel plate automatically is being marketed by a major welding equipment maker. The machine consists of an electronic tracer, a pantograph, and several metal cutting torches which are mounted on a frame to cut patterns side by side.

The tracer developed for the machine projects a beam of light on a black template and steers a tracer wheel around the pattern of an object to be cut. The wheel is connected to the pantograph, a steel parallelogram, to which is attached a series of cutting torches. As the tracer moves, so do the torches, over a steel plate. Thus the pattern is duplicated.



*Electronic tracing machine duplicates intricate steel patterns*

In the photograph (above) the tracer wheel is following a pattern. Its motion is duplicated by the four cutting torches which form similar patterns over the steel.

The torches will operate with acetylene, propane, or natural gas. A control panel operates the torches, and if necessary, the torches can be operated manually. The entire machine, with two lengths of ten-foot track, and rails for the steel plates requires about 20′ x 20′ of space. It is capable of cutting steel plates up to 8′ wide and 12″ thick. According to the company the machine uses less electricity than a breakfast toaster. The plates which the machine can cut are of particular use in the shipbuilding and heavy machinery industries, where strong, but intricately cut steel pieces are needed for fittings. Manufacturer: Air Reduction Company, 150 East 42nd Street, New York, New York.

### Plastic film of great strength

The development of a film for packaging which is said to be strong enough to be made into a gas tank for an automobile has been announced. The new film, called "Estane VC," may be of interest to manufacturers who need a film with both integral strength and stitchability, or the quality of not tearing at a puncture caused by sewing. Many films used now must be supported with fabric backing wherever stitching is required. The film is claimed to be unaffected by gasoline or other petroleum products.

The thin material may be stitched or sealed electronically or by heat to form a leak-proof cell. It will remain flexible at temperatures below zero, and is said to be from three to five times stronger than other materials commonly used for films. Manufacturer: B. F. Goodrich Company, Akron, Ohio.

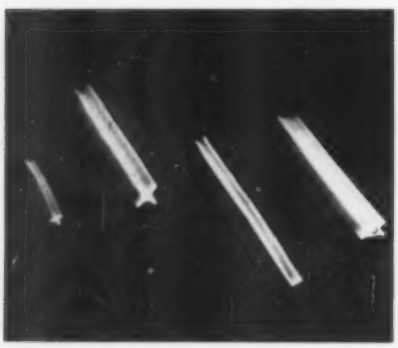
### Paper for insulation

A new line of insulation papers which are inorganic and are said to be resistant to high temperature and fire are being prepared from a special type of synthetic mica by the Minnesota Mining and Manufacturing Company. The paper is called Crystal M and three forms are available. One is a paper made entirely of the synthetic mica; the other two are made of the mica in combination with fibers which are introduced during the manufacturing process. The paper can be made in thicknesses of 2 to 10 mills but now it is available in 5 mills only. The density of the paper may vary from 0.6 to 1.7 grams/cm$^3$ depending on the construction.

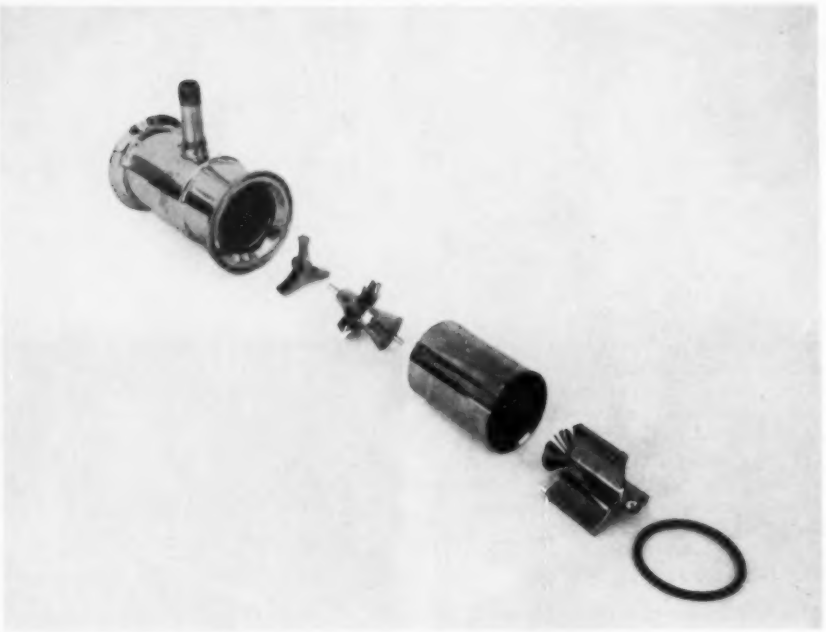
The new papers may be used as fire resistant materials, thermal insulation, electrical insulation, and fire-resistant document paper. In electrical applications, for instance, the Crystal M papers can be used on wires and cables as high-temperature insulation. Combining the paper with metal foils or plastic could produce good insulation wrappings or interlayers. Metal fibers or graphite can also be included in the paper during manufacture to control resistivity. Manufacturer: Minnesota Mining and Manufacturing Company, 900 Bush Avenue, St. Paul 6, Minnesota.

### Extruded Teflon in shapes

A variety of complex and dimensionally accurate Teflon plastic shapes are now being produced from segmented dies. Continuous shapes or profiles thus made can eliminate costly machining or rod or tube stock, according to the producer. These extruded plastic shapes can be used for various trims or for electrical housings. Teflon plastic is said to have the widest temperature service range of any plastic (—450°F. to 500°F.) and it is among the



most resistant to corrosion. The molds and dies used to produce these shapes are generally of carbon steel and are made by the manufacturer upon order for the shapes required. The molds can be supplied to the contractor, however. Manufacturer: Pennsylvania Fluorocarbon Company, Inc., Philadelphia, Penna.



### Redesigned flowmeter

A new way of measuring the rate of flow of liquids is achieved with the Potter meter, a flowmeter which uses a spinning rotor, rather than the conventional flowmeter principle; i.e. a thrust bearing which is displaced in proportion to the pressure of the flow. The new device consists of a rotor whose fins are turned by the flow of the liquid moving past it. The downstream drag factor, created by flow through the rotor fins, is exactly balanced by the upstream thrust caused by the consequent decrease in fluid velocity and corresponding pressure recovery. Thus, the rotor is said to spin freely, in proportion with the rate at which the liquid is moving. A magnet, inside the rotor, produces an electric signal which can be translated into rate of turn without the need for external electrical contact. The frequency of turns in the rotor produces the signal which can be used to control or simply to measure the rate of flow.

The meter can be used for either irregular or continuous flow, and for applications involving solvents, acids, caustics, hydrocarbons, liquefied gases, and solutions containing suspended particles. Manufacturer: Potter Aeronautical Corporation, U. S. Route No. 22, Union, New Jersey.

### Furnace superheats air

A new heating and an air-conditioning system for homes, factories, or military installations utilizes a jet-engine type burner to force small but intense streams of heated or cooled air through flexible ducts. The units are said to use 20 per cent less fuel than comparable heating and cooling systems of the same output.

The heating unit works in this manner: the jet-engine type burner delivers air at temperatures of 350°-500°F. at pressures of around 1.50 I.W.C. through pipes. Adjacent to these pipes is a blower which blows fresh air past the pipes, thus heating the air. The fresh air and the super-heated air in the pipes flow in opposite directions, for more efficient heat extraction, and the heated air is then sent through flexible ducts to its destination.

The air cooler utilizes a small amount of cool air under pressure, from a refrigeration unit, and mixes this cool air with a larger amount of air at room temperature, to lower the relative humidity of the room temperature air. These units are separate, but sold in matching containers. Manufacturer: Jet-Heet Inc., Englewood, N. J.

### Machine reads handwriting

An experimental machine which translates script-written numbers into numerical symbols has been developed by Bell Laboratories. At present it will "read" only numbers from zero through nine, but Bell hopes that the principle may be eventually used for a machine which could read a wide variety of handwritten material. Reading machines could be valuable in any business or industry where information must now be translated into machine language by punched cards, tape, or by pressing the keys of an adding machine.

To use the Bell machine, the writer moves a metal stylus over a special surface just as if he were writing with a pen. He then touches a button marked "identify,"

and a light appears signifying what number he's written. The machine "reads" by picking out features of the written word —the length of the word, the dotting of i's, and the number and position of vertically extended letters such as "h" and "g." There are now machines which can read letters, but they require a uniform and rigid script. Compared to earlier models, this machine has a high degree of accuracy with different styles of writing, as long as the writer plays fair and dots his "i's" and crosses his "t's." Source: Bell Telephone Laboratories, 463 West Street, New York 14, N. Y.

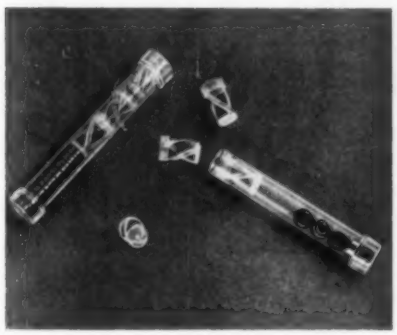
### New photofilm exceptionally fast

The Polaroid Corporation has announced the availability of a film for use with their camera with a film speed rated at ASA 3000. The Type 47 film will be especially useful, according to the company, in picture-taking under ordinary room conditions, without flash.

Films of approximately the same speed are available with conventionally developed films, but this is the first film of such a high speed to be used with the Polaroid Land Camera. Manufacturer: Polaroid Corporation, Cambridge 39, Massachusetts.

### Polyethylene buffer

Polyethylene is being employed as a packing material for shipment of ball bearings used in gyroscopes and other electronic equipment. Bearings used for these purposes are ground to tolerances of 1½-ten thousandths of an inch and the smallest of them has a diameter of .1-inch; the least nick or scratch makes them unserviceable. In a missile guidance system, for example, bearings ground to such tolerances are rendered useless by the slightest imperfection, because an inaccuracy at this point is



magnified enormously over the distance which missiles must travel.

The new shipping method uses plastic vials and a polyethylene filling in the form of buffers, which separate and immobilize the bearings so that they cannot rub against one another, causing scratches.

This method has advantages over the conventional oil damping technique. It is lighter in weight; the buffers do not lose their resilience, thus maintaining a constant pressure on the bearings; and the user will receive the bearings with only a protective shield of lubricant, rather than in an oil bath which can spill over work. The buffers are said to be entirely free of lint or other minute contaminants. Source: New Hampshire Ball Bearings, Inc., Route 202, Peterborough, N. H.

### Electrical distribution system

Electrical power take-off in industrial plants and commercial buildings can now be accomplished without disconnecting the main line of power. A new duct, called the "XL" duct, contains a safety plug whose cover will remain closed until actual contact is made. It is said to be practically impossible for a workman to cause an arc —even by deliberately attempting to do so. These ducts are used in industrial plants where large amounts of electricity must be used to run machines. Installations to supply electrical current must be safe and well-made in order to withstand constant use and the danger of accidental breakage. The "XL" duct is designed so that even an inexperienced mechanic can install it with no danger of electrocution from the high voltage currents which run through it. The installation is comparatively simple. The connection is established by the tightening of a bolt designed to increase the contact between cables. A bolt is provided which automatically tightens the connection to above 3,000 pounds of pressure per square inch. Thus the connection can make a contact with little resistance loss or danger of breakage.

Besides its safety factors and ease of operation, the new duct is said to be able to withstand greater stresses. It will be available in ampere ratings of 225 through 1,000 amperes, voltage ratings through 600 volts, AC 1-3-4W, and full neutral in all sizes. In the photograph (above) the duct is shown being installed. Manufacturer: Bulldog Electrical Products Company, Box 117, Detroit 32, Mich.

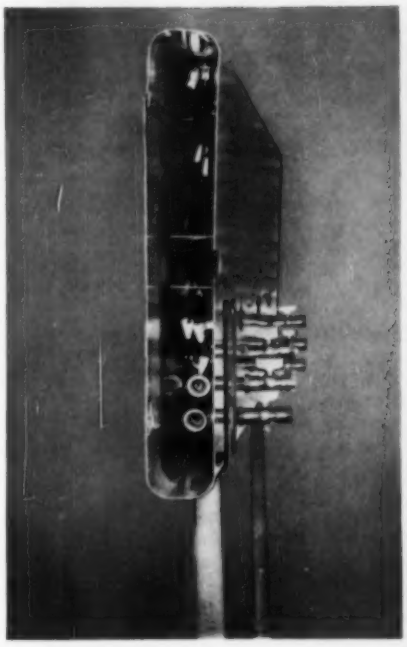
### Prefabricated power housing

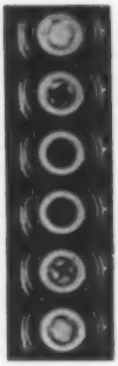
A prefabricated housing for power or communication lines is now being manufactured as a preconstructed metal unit which can be joined to provide protected space for electrical wires, or gas and liquid pipes. Advantages of such a means of housing power lines are simplicity, cleanliness and ease of repair.

Each module is five feet long and less than three inches in depth. There are "T's," right angles, and "L's" to follow walls and contours, and the pieces can be mounted on walls with brackets. In the photographs below, a side and a cross view of the channels are seen. The holes are for power leads.

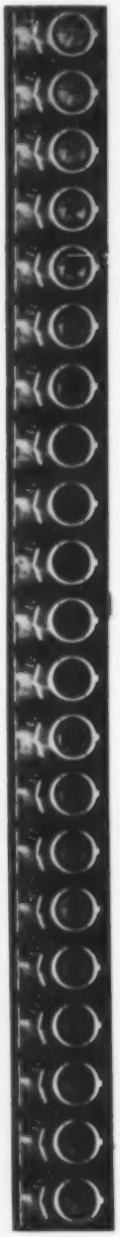
The bottom of the channel is a special pocket intended for heavy amperage leads for spot welders or any other cables, such as for closed circuit tv. Openings in each module provide leads for connections with machines to be powered.

Manufacturer: Alden Systems Company, Alden Research Center, P. O. Box 125, Westboro, Massachusetts.





*Graflex* 1000 *shutter*
1/1000 *second*
*wide open* (1" *diameter*)



*Shutter "A"*
1/400 *second*
*wide open* (1" *diameter*)

### New shutter with fast speeds

The Graflex Company, makers of the standard American press-type camera, have announced a new between-the-lens shutter for use with their new Super-Graphic Camera. The new shutter is said to have a top speed of 1/1000 of a second at its full one-inch aperture.

Until now photographers had to rely on the focal plane shutter for rapid-action photography. The introduction of the Graflex 1000 between-the-lens shutter permits high-speed exposures without the limitations normally associated with focal-plane shutters, such as distortion and inaccuracy at high speeds.

The Graflex 1000 shutter is said to use a new concept in shutter operation. Each of four shutter leaves is separately mounted and guided by an eccentric and a stud operating in a slot. The resulting blade motion is elliptical, and thus the blades are not required to stop abruptly and reverse motion during the exposure. This elliptical motion allows the shutter mechanism to accelerate to top speed before the blades open, and close with a braking, gradual action. According to the makers, the new shutter can synchronize with M-type flash up to 1/750th of a second, and with Strobo-flash up to 1/1000th.

Whether the new shutter casts as much light on the edges of the film plate as on the center, which is not the case with most between-the-lens shutters, is a matter of some dispute. One considerable convenience of the Graflex shutter is, however, its method of cocking, which is simply to turn the lens shade, which is an integral part of the shutter. Manufacturer: Graflex, Inc., Rochester, New York.

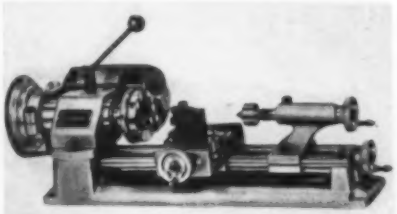
### Colored magnetic tape

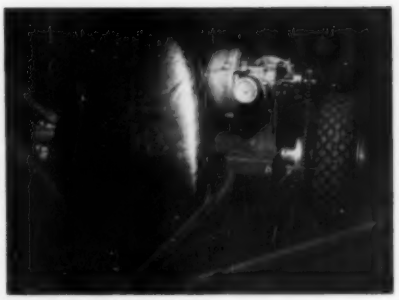
The first magnetic tapes for tape recorders and computers in colors other than the traditional "oxide brown," is announced by Audio Devices, Inc. The new tapes are similar in all other respects to the conventional tape, but are colored blue or green for recognition.

A choice of colors can be a considerable aid to the recording engineer who will now be able to distinguish at a glance between categories of recorded materials or tapes. Manufacturer: Audio Devices, Inc., 444 Madison Ave., New York 22, N. Y.

### Versatile machine tool

A small machine tool that could enable shops or laboratories to repair, or even make, their own replacements is now on the market. The tool, called a Unimat, combines the functions of a lathe, drill press, tool and surface grinder, and polisher. Available attachments include parts that can convert the machine to a vertical milling device, a jig saw, a bench saw or a threader. A belt drive provides speeds from 255 to 4000 rpm. The Unimat is 16" long and weighs 30 pounds. Manufacturer: Chicago Apparatus Company, 1735 North Ashland Avenue, Chicago, Illinois.





### Centrifugal force aids clutch

A line of centrifugal clutches and cam-actuated solid shoe brakes for racing cars has just been developed. The clutches feature a pin-cage design which locks the shoes against the drum when actuated. This eliminates slippage and increases torque. The drive element is made of a solid friction material, a drive plate, four drive pins, and retaining springs. The driven member, a clutch drum with belt pulley, is retained by a ring and screw. In low speeds, the ring holds the shoes against the pins. As the speed increases, centrifugal force overcomes spring tension, and the shoes contact the drum. This contact displaces them in a direction opposite to crankshaft motion, causing the cam assembly to wedge against the pins, which increases torque. Such devices have been used in ordinary cars, but this method of clutching and braking is an innovation in racing cars. Manufacturer: Fairbanks, Morse & Company, Magneto Division, Beloit, Wisconsin.

### Bright warning light

A warning light, said to be the biggest and brightest on the market, is now being made by the Dietz Company. This new light has the lens diameter of a traffic signal—8 inches—and delivers 60 candlepower for 650 hours, powered by two NEDA #6 dry cells. The flash rate is 65 per minute, and the unit weighs 8 pounds. The fixture is available with either amber or red lenses. Manufacturer: Dietz Company, Syracuse, N. Y.

# Manufacturers' Literature Supplement

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

### Materials — Metals

1. **High-Strength Steel.** Latrobe Steel Company. Technical bulletin describes applications of Viscount 44, a pre-hardened, high-strength steel, with specifications of the steel's strength and other qualities.

2. **Tensile Testing Machines.** Steel City Testing Machines, Inc. 4 pp. Illustrated booklet describes tensile testing machines with capacities up to 40,000 pounds. Descriptions of methods of operation for manual and motorized hydraulic units included.

3. **Elevator Furnaces.** General Electric Company. 4 pp. Bulletin contains illustrated explanation of GE's complete line of electric elevator furnaces for batch annealing of standard and pearlitic malleable iron.

4. **Solder Joint Reliability.** Dressen-Barnes Corporation. 4 pp. Report on steps to improve the quality of soldered joints. Various kinds of soldered joints are shown with detailed instructions on better soldering techniques.

5. **Wire and Strip Components.** Titchener & Company. 22 pp. Handbook contains case studies of how designers were able to improve quality and sales of products by the use of wire and metal components. Booklet mentions major types of wires and strips available, and popular finishes.

### Materials — Plastics

6. **Plastic Resins.** Michigan Chrome and Chemical Company. 6 pp. Brochure illustrates "Miccron" process for applying plastic resins in a fluidized bed, to make plastic parts and components.

7. **Reinforced Polyester.** Chemicals Division, Atlas Powder Company. 4 pp. Case history bulletin reports on how Thermoflow 100, a reinforced polyester molding compound, was used for a pressure filter plate. Specifications on a number of plastics are included.

8. **Glass-Epoxy Laminates.** Taylor Fibre Company. Two laminates, one with a glass base and an epoxy resin, and the other copper-clad, are described in two technical data bulletins, which also give material on properties of manufacturer's other laminates.

9. **Electrical Ceramic Parts.** Ferro Corporation. Bulletin 59-E specifies electrical ceramic parts available for standard and custom installations. Data included on cordierite refractory heater plates, heater cores, and terminal blocks.

### Methods

10. **Hermetic Sealing.** General Hermetic Sealing Corporation. Brochure explains how hermetic sealing of instruments can protect them against moisture and temperature change. Advantages of modern methods of hermetic sealing are discussed.

11. **Brass Tube Fittings.** The Weatherhead Company. Catalog C-301 lists brass and steel tube fittings, tube working tools, hose, hose ends, and assemblies most frequently used in hydraulic and pneumatic systems.

12. **Resistor Wire.** Hoskins Manufacturing Company. 12 pp. Booklet contains detailed technical data on resistor material, particularly the company's low-density, high resistivity Alloy 815-R precision resistor wire. Included are tables and graphs covering the wire's corrosive resistance and its strength.

13. **Strapping Machines for Packaging.** General Strapping Corporation. 16 pp. Booklet describes advantages of using automatic packaging machines and shows varieties available. Also shows hand tools used for packaging articles whose shapes lend themselves to manual wrapping.

14. **Variable Speed Belts.** Maurey Manufacturing Corporation. 32 pp. Catalog shows variable speed belts for machines. The booklet also gives a guide to applications, variable speed cross-reference tables, and listing of manufacturer's part numbers.

### Miscellaneous

15. **Hinges.** Rex Hinge Company. Data catalog lists line of over 1900 standard and semi-standard continuous hinges available from manufacturer. Illustrated and with dimensions listed.

16. **Digital Magnetic Tape Handler.** Ampex Corporation. Booklet describes the FR-400 tape handler and explains what the machine can do.

17. **Rotary Gear Pumps.** Northern Ordnance Inc. Bulletin No. 42 describes design features of Nitralloy rotary gear pumps and gives detailed tables on the pumps' ratings, pressures, and uses.

18. **Soundproof Ceilings.** Columbia Acoustics and Fireproofing Company. 4 pp. Booklet illustrates uses of Cafco Sound-Shield, a sound absorption spray-on treatment for offices, hotels, stores and other commercial buildings.

19. **Lapping-Polishing Machines.** Syntron Company. Illustrated booklet presents specifications for four Syntron vibratory lapping-polishing machines for polishing of metallurgical samples for examination.

20. **Spring Loaded Pulleys.** Maurey Manufacturing Corporation. Booklet illustrates the manufacturer's line of spring loaded pulleys and adjustable motor bases. Included are charts and data on uses of these pulleys.

21. **Chassis Punches.** Walsco Electronics Company. Brochure lists sizes and types of punches available and applications for the punch, which is used on electrical chasses.

22. **Condensed Butterfly Valve.** Continental Equipment Company. Bulletin shows company's line of butterfly valves, with chart aiding in selection. Valve sizes range from 1" to 108" with pressure drops up to 1200 psi and temperatures up to 2000°F.

23. **Cooling Tower.** Cleveland Worm & Gear Company. Bulletin 135-S gives sizes, dimensions, and horsepower ratings for Cleveland Worm Gear type-CU drives for cooling tower service.

24. **Multipress.** Denison Engineering Company. 4 pp. Booklet describes Denison multipresses, including their latest equipment Models range from 1 to 12 tons and are illustrated in the booklet.

25. **Industrial Radiography.** Picker X-Ray Corporation. 12 pp. Booklet entitled "Industrial Radiography with Radioisotopes" discusses equipment for, and methods of, radiographing all kinds of industrial products, and the advantages peculiar to isotopes in industrial testing. Also lists services available through manufacturer.

26. **Techniques of Swept Audio Measurement.** Panoramic Radio Products, Inc. Frequency response and distortion measurements of hi-fi equipment are discussed in an issue of the "Panoramic Analyzer," a publication available from the manufacturers.

27. **Electrical Contacts.** Gibson Electric Company. 4 pp. Catalog lists materials, properties, forms and uses of the Gibson line of electrical contacts made from various metals, including some special alloys.

28. **Floors for Food Plants.** Atlas Mineral Products Company. Booklet describes Furname tile flooring developed especially for food manufacturing plants, and said to be sanitary and easy to clean.

29. **Comparison Chart for Stainless Cold Heading Wire.** Universal-Cyclops Steel Corporation. 4 pp. Brochure compares cost, corrosion resistance, and characteristics of commonly used grades of stainless steel cold heading wire.

30. **Flash and Stroboscopic tubes.** Amglo Corporation. 6 pp. Catalog lists equipment and specifications for Amglo Stroboscopic tubes, reflective base flashbulbs, and signal lights.

31. **Hydraulic Needle Valves.** Auto-Ponens, Inc. Catalog AP59 describes line of forged aluminum, steel and stainless steel needle valves for hydraulic systems.

32. **Electrical Insulating Varnishes.** Minnesota Mining and Manufacturing Company. Catalog illustrates the selection and application of insulating varnishes for electrical insulation. Specifications of varnishes are included.

33. **Magnetic Tape Eraser.** Southwestern Industrial Electronics Company. Bulletin illustrates the SIE MTE-2 Magnetic Tape Eraser, which is designed to provide clean de-magnetization of either direct or FM recorded tapes. Product permits tapes to be erased without removing them from their containers.

34. **Dual Shield Electrodes.** National Cylinder Gas Division, Chemetron Corporation. Welding characteristics and data for continuous fluxed cored electrodes are contained in bulletin NH-103T. Diagrams included show operating positions for the welding process.

35. **Temperature Control of Heat Treating Furnaces.** General Electric Company. Bulletin GER-1206 is a reprint of articles which appeared in *Steel Magazine* on thermocouples, control instruments, control elements, and other systems for control.

36. **Corrosion-Resistant Alloys.** Carpenter Steel Company. Bulletin describes corrosion resistant alloys and gives table comparing the applications of various kinds of alloys and their distinctive qualities.

37. **Area Floodlighting.** Crouse-Hinds Company. Brochure 2719 entitled "Area Floodlighting Made Easy" gives reference material for planning lighting for parking areas, construction sites, and other installations for floodlights. Charts give information on how many and what kind of lights are needed for various uses.

38. **Slitting Equipment for Coil and Sheet.** The Yoder Company. 76 pp., ill. Newly revised brochure describes design, selection, and operation of slitters, and slitting lines. Gives time studies and detailed analysis of operating cycles; specifications, capacity tables and other tada on Yoder standardized series of slitters, recoilers, coil cars, and scrap shoppers.

39. **Storage File for Combination Letter-Legal Records.** Dolin Metal Products, Inc. Brochure describes new Dolin files which combine records-storage economy with system flexibility for large or small records-storage areas.

40. **Report on U. S. Brass Mill Industry.** Copper and Brass Research Association. 48 pp., charts & statistical data. Booklet attributes decline of the brass industry in the U. S. to American international economic policies. Gives analysis of the brass mill industry's significance in the overall U. S. economy, and recommendations for restoring health to the brass industry, by changing the existing import policy.

41. **Instrumentation Systems for Shock and Vibration Measurements.** Columbia Research Laboratories. 52 pages, ill., catalog gives detailed data and suggested applications for all the company's accelerometers, cathode followers, amplifiers, transistorized amplifiers and pre-amplifiers.

42. **Drafting Equipment.** Stacor Equipment Company. 24 pp., ill. Booklet is 1959 catalog of drafting equipment for offices, artists, and schools. Included are descriptions of the new Staktube Roll File, a storage system for large rolled blueprints, charts, etc.

43. **Hardboard Processing.** Silvatek Products Division, Weyerhauser Timber Co. 8 pp., ill. Brochure describes suggested techniques for the processing of Weytex hardboards: machining, bending, laminating, finishing and fastening. Charts give sizes and physical properties of Weytex.

44. **Anticipating Insulation Failures.** Associated Research, Inc. New bulletin (5-1-3) details practical methods for forecasting failure of insulation materials on electric motors and generators, and includes information on maintenance of cables and transformers.

45. **Gate Valves.** Whittaker Controls. Gate valves and their uses in electrical systems and with fluids are illustrated in a brochure. The booklet contains specifications, dimension tables, and a catalog of off-the-shelf gate valves from the manufacturer.

46. **Lift Trucks.** Hyster Company 8 pp. Brochure illustrates uses of Challenger 100-series lift trucks for factories and stores. These trucks are said to have an exceptionally short turning radius and high lifting power.

(No Model.)

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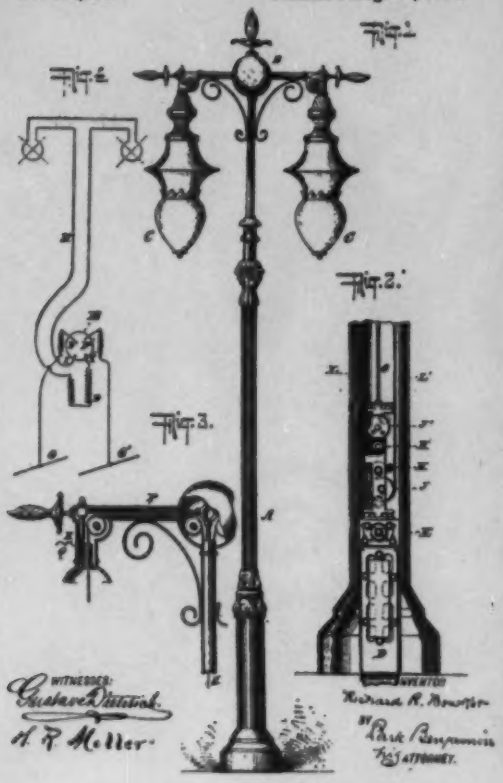

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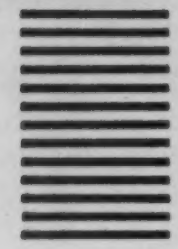

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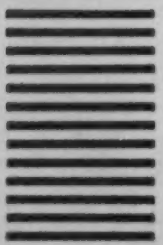

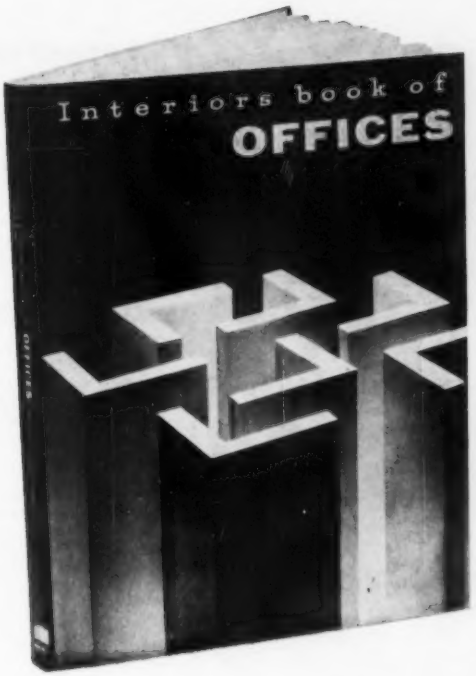


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INDUSTRIAL DESIGN, published Monthly at New York, N. Y., for October 1, 1959.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:
Publisher, Charles E. Whitney, 18 East 50th Street, New York 22, N. Y.; Directing Editors: Editor in Chief, Ralph S. Caplan, 18 East 50th Street, New York 22, N. Y. Art Director, James S. Ward, 18 East 50th Street, New York 22, N. Y.; Managing Editor, Betsy Darrach, 18 East 50th Street, New York 22, N. Y.; Business Manager, Alec E. Oakes, 18 East 50th Street, New York 22, N. Y.

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ANNE HARMSE
(My commission expires March 30, 1961)



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### For Your Calendar

**November 17-20.** Packaging Machinery Manufacturers Institute Show. New York Coliseum, New York.

**November 23-25.** "Capitalizing on Technology." Conference sponsored by the AMA's Research and Development Division. Ambassador Hotel, Los Angeles.

**November 30-December 4.** Twenty-seventh Exposition of Chemical Industries. New York Coliseum, New York.

**December 2-4.** Forty sixth annual convention of the National Warm Air Heating and Air Conditioning Association. Chase Park Plaza Hotel, St. Louis, Missouri.

**December 6-January 3.** Toy Show. Walker Art Center, Minneapolis, Minnesota.

**December 7-January 3.** "Forms from Israel." Exhibition at the Trade and Convention Center, Philadelphia.

**December 7-9.** AMA briefing sessions on the new defense market. Speakers include officials from Department of Defense and Air Force. Ambassador Hotel, Los Angeles.

**December 7-11.** "Developing Profitable Products." AMA orientation seminar. $250. Ambassador Hotel, Los Angeles.

**December 13-January 3.** "Midwest Designer-Craftsmen." Smithsonian Institution traveling exhibition. Rollins College, Winter Park, Florida.

**January 13-24.** National Motorboat Show. Jan. 13-15. Trade only. Jan. 15-24, public. New York Coliseum, New York.

**Opening January 15.** "Festival of France." Exhibition at the Trade and Convention Center, Philadelphia.

**January 17-20.** Annual Canners Convention and Canners Show. Americana Hotel, Bal Harbour, Florida.

**January 22-February 14.** "Architectural Photography." Smithsonian Institution traveling exhibition. Georgia Institute of Technology, Atlanta.

**January 25-28.** Eleventh Plant Maintenance and Engineering conference. Discussion sessions, exhibit of products and services demonstrated under simulated factory conditions. Convention Hall, Philadelphia.

**February 1-5.** Instrument Society of America instrument-automation conference and exhibits. Houston Coliseum, Texas.

**February 2-4.** Fifteenth SPI Reinforced Plastics Division conference. Edgewater Beach Hotel, Chicago.

**December 14-16.** "Market Research," AMA orientation seminar, $150; "Product Manager," workshop seminar, $125. Astor Hotel, New York.

**Dec. 14-18.** "Product Package Design Forum," AMA orientation seminar, $200. Astor Hotel, New York.

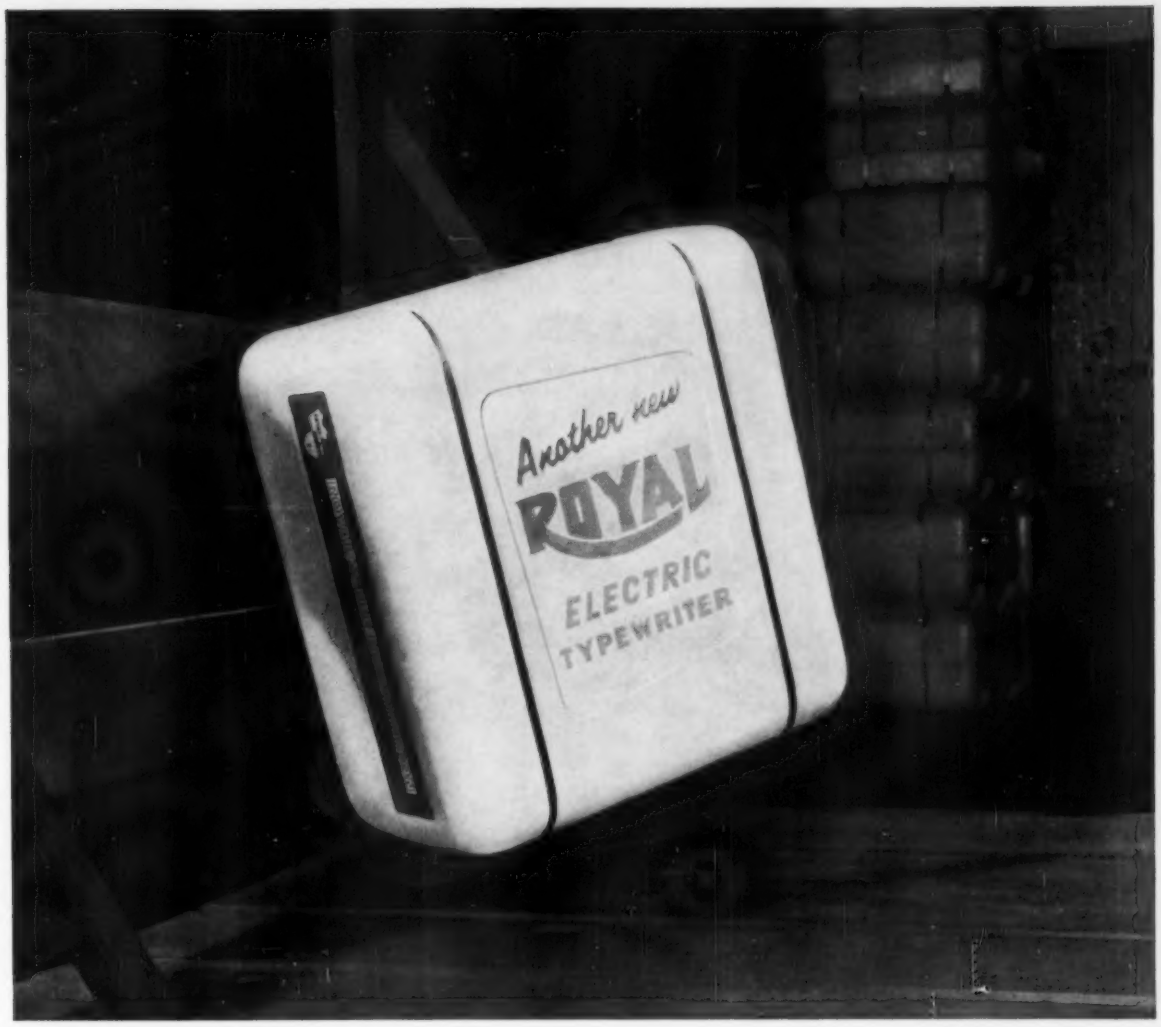
**January 1-24.** "The Story of American Glass." Smithsonian Institution traveling exhibition. Des Moines Art Center, Iowa.

**January 1-30.** "Fulbright Designers." Smithsonian Institution traveling exhibition. Pensacola Art Center, Florida.

**January 4-15.** The International Home Furnishings Market, in conjunction with: The Toy and Juvenile Market, Jan. 4-17; The National Housewares Show and Import Show, Jan. 4-15. Merchandise Mart, Chicago.

**January 10-14.** Forty-ninth Annual Convention of the National Retail Merchants Association. Hotel Statler Hilton, New York.

**January 12-16.** Sixteenth Annual Technical Conference of the Society of Plastics Engineers. Conrad Hilton Hotel, Chicago.




# HOW TO BOUNCE A TYPEWRITER . . . SAFELY !

## Pack it in shock-absorbing DYLITE® foam plastic

In that DYLITE polystyrene pack on the vibration table is a 47-pound Royal Electric Typewriter, being bounced at the rate of 260 times a minute. At the end of one hour's vibration, the typewriter was removed and checked. It worked perfectly! Thanks to the protective qualites of DYLITE plastic, the delicate typewriter mechanism survived the equivalent of a 1000-mile road trip without damage.

Here's why Royal-McBee uses this DYLITE package. DYLITE absorbs shocks, does not transmit them. DYLITE molds readily to conform perfectly to the intricate shape of the typewriter and hold the delicate movable parts motionless. DYLITE is light in weight. The finished pack weighs only 3½ pounds, reduces shipping costs and cuts the time required for packing by 4½ minutes.

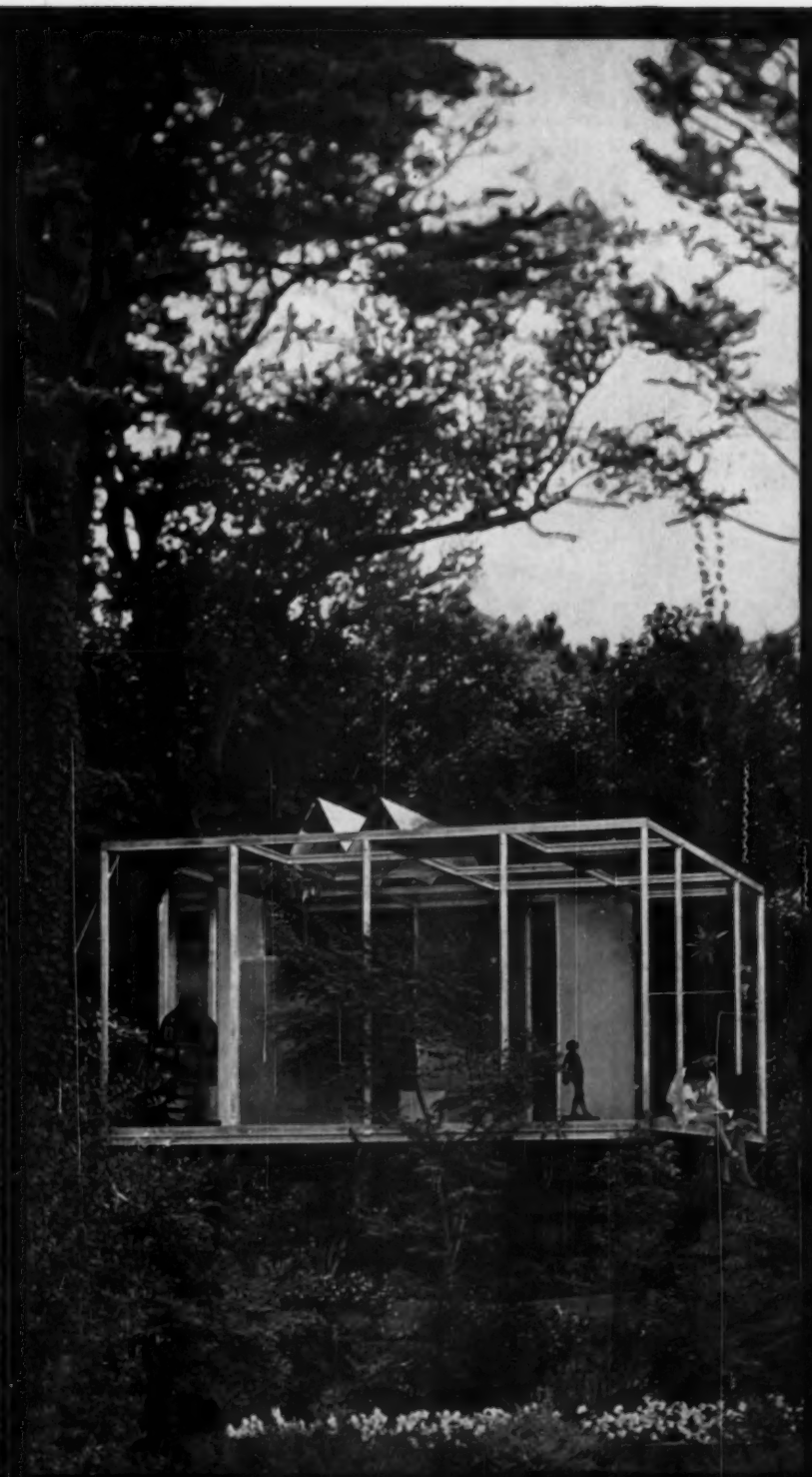
Other properties make DYLITE a designer's ideal material. It insulates against heat passage. It is water-resistant. It is buoyant and strong. In addition to protective, decorative and display packaging, DYLITE is used in many other ways. Here are a few: boats, toys and other flotation equipment; insulation in refrigeration and air conditioning equipment; molded furniture frames, recently developed resilient DYLITE for automotive dashboard paneling and cushioning and insulation panels for housing. For the complete story of the design possibilities of DYLITE expandable polystyrene, write to Koppers Company, Inc., Plastics Division, Dept. ID-119, Pittsburgh, Pennsylvania.

Offices in Principal Cities · In Canada: Dominion Anilines and Chemicals Ltd., Toronto, Ontario.

**KOPPERS PLASTICS**

*DYLENE® polystyrene, SUPER DYLAN® polyethylene and DYLAN® polyethylene are other fine plastics produced by Koppers Company, Inc.*

KOPPERS



Aluminum view box designed for the Alcoa Collection by John Matthias. Photographed by Ted Castle.

# FORECAST:

**There's a world**
**of aluminum**
**in the wonderful**
**world of tomorrow**

. . . where any place that beckons on mountainside, meadow or shore will become your sheltered retreat . . . because aluminum will travel with you . . . standard shapes of light, strong, weatherproof aluminum that become airy, expansible shelters as kind to the landscape as sunlight . . . as portable as the tents of the Arabs.
Aluminum Company of America, Pittsburgh

**ALCOA ALUMINUM**