INDUSTRIAL DESIGN

6

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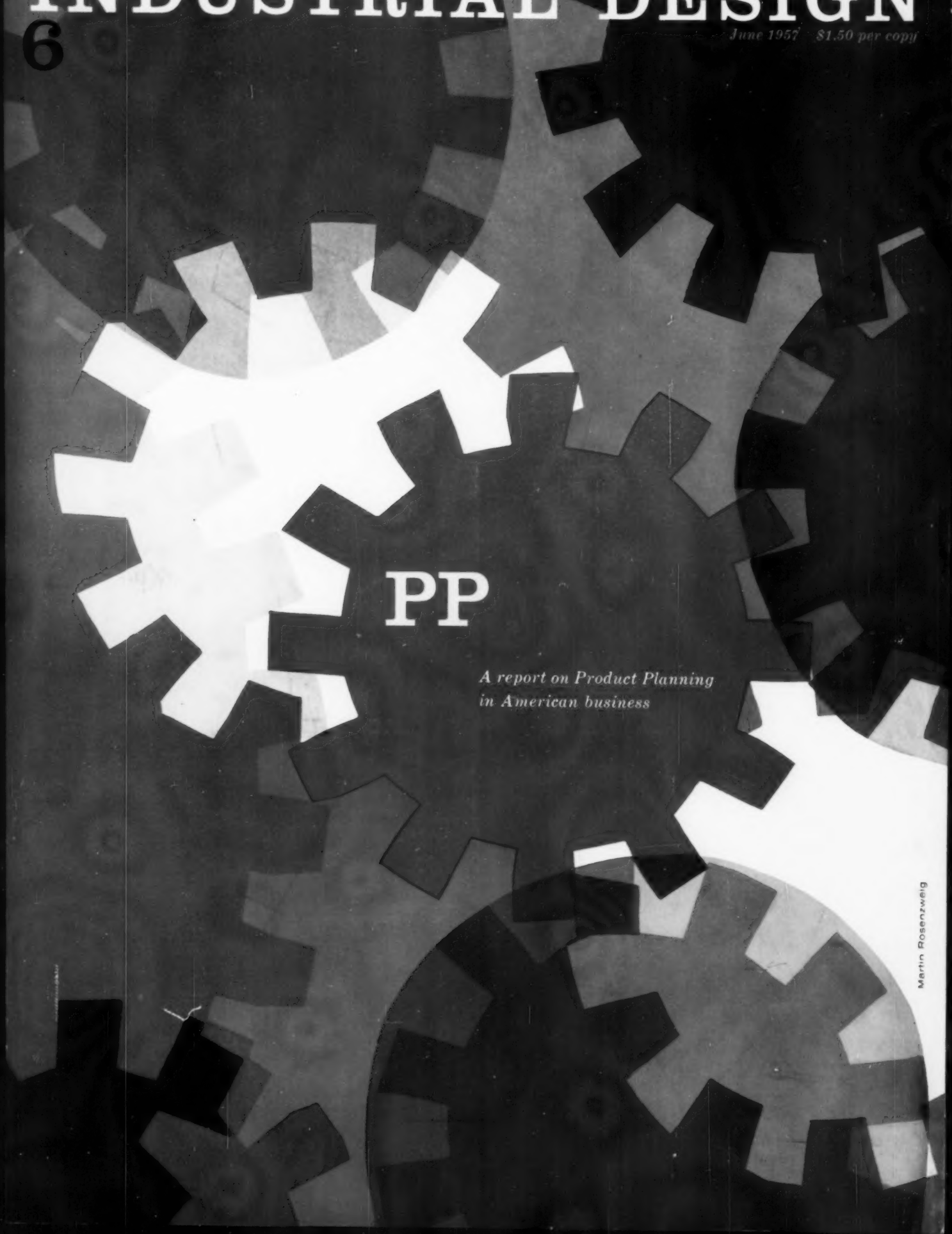

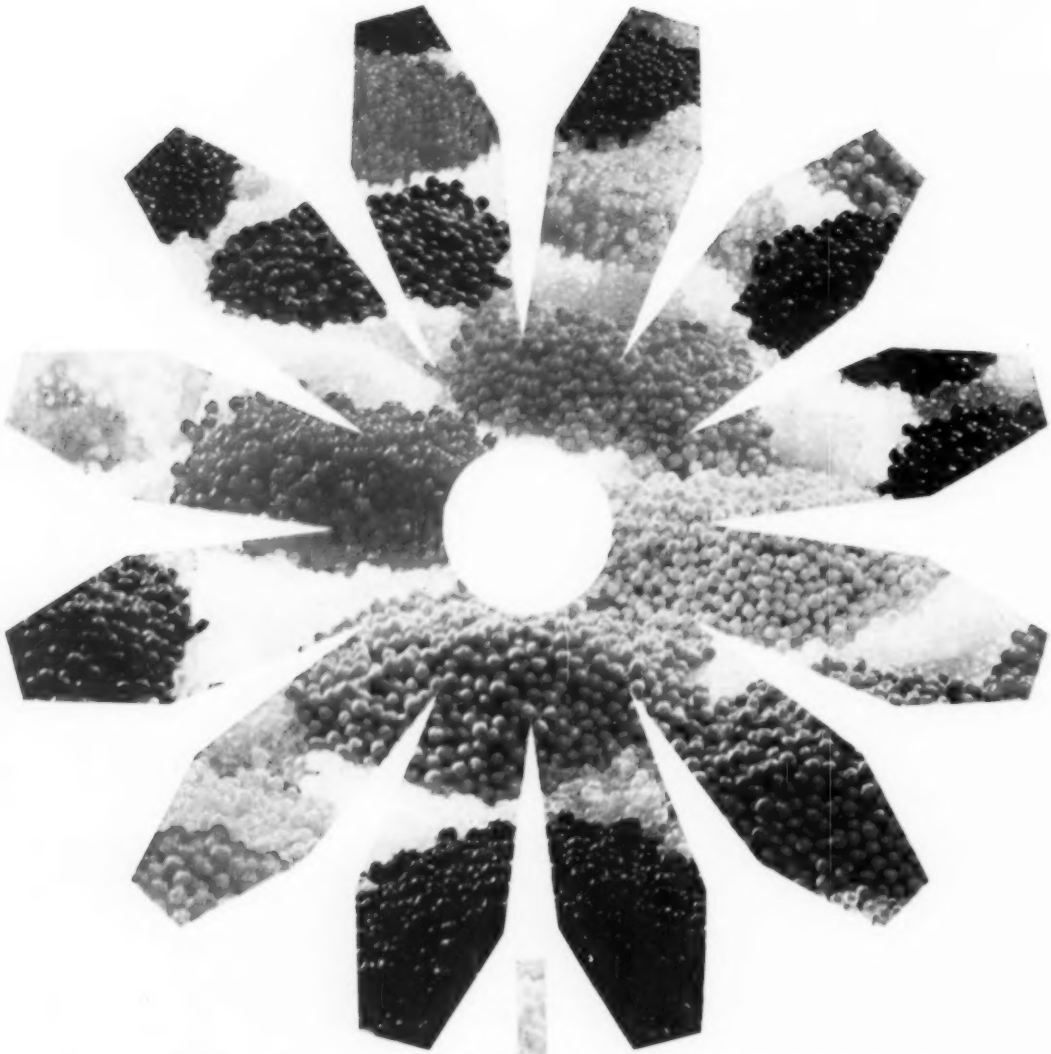

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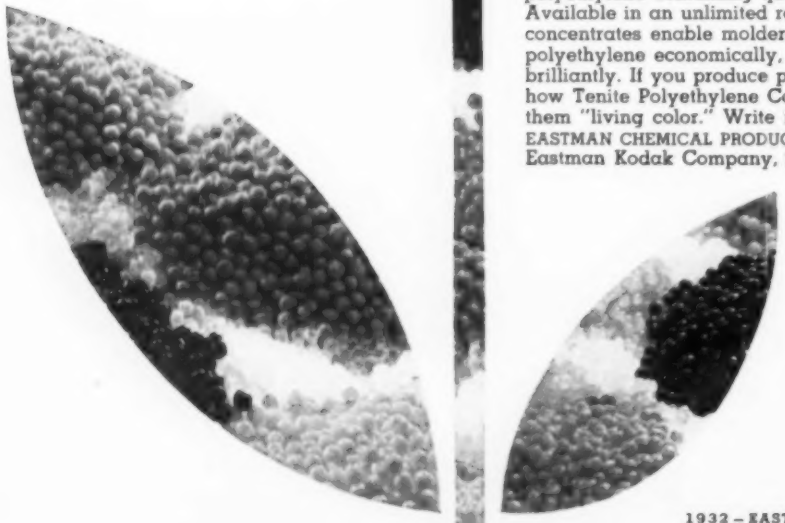

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JUNE, 1957 VOLUME 4 NUMBER 6

INDUSTRIAL DESIGN

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

CONTENTS

COVER: Enmeshing the gears of the process of product creation is the job of the product planner. More about this new executive in American business on pages 37-50.

FRONTISPIECE: Photo of the range assembly line at G.E.'s Appliance Park, Louisville, symbolizes the product planner's job: keeping the factory fed with products that will anticipate the markets' needs. How he does it in a number of businesses is discussed on pages 37-60.

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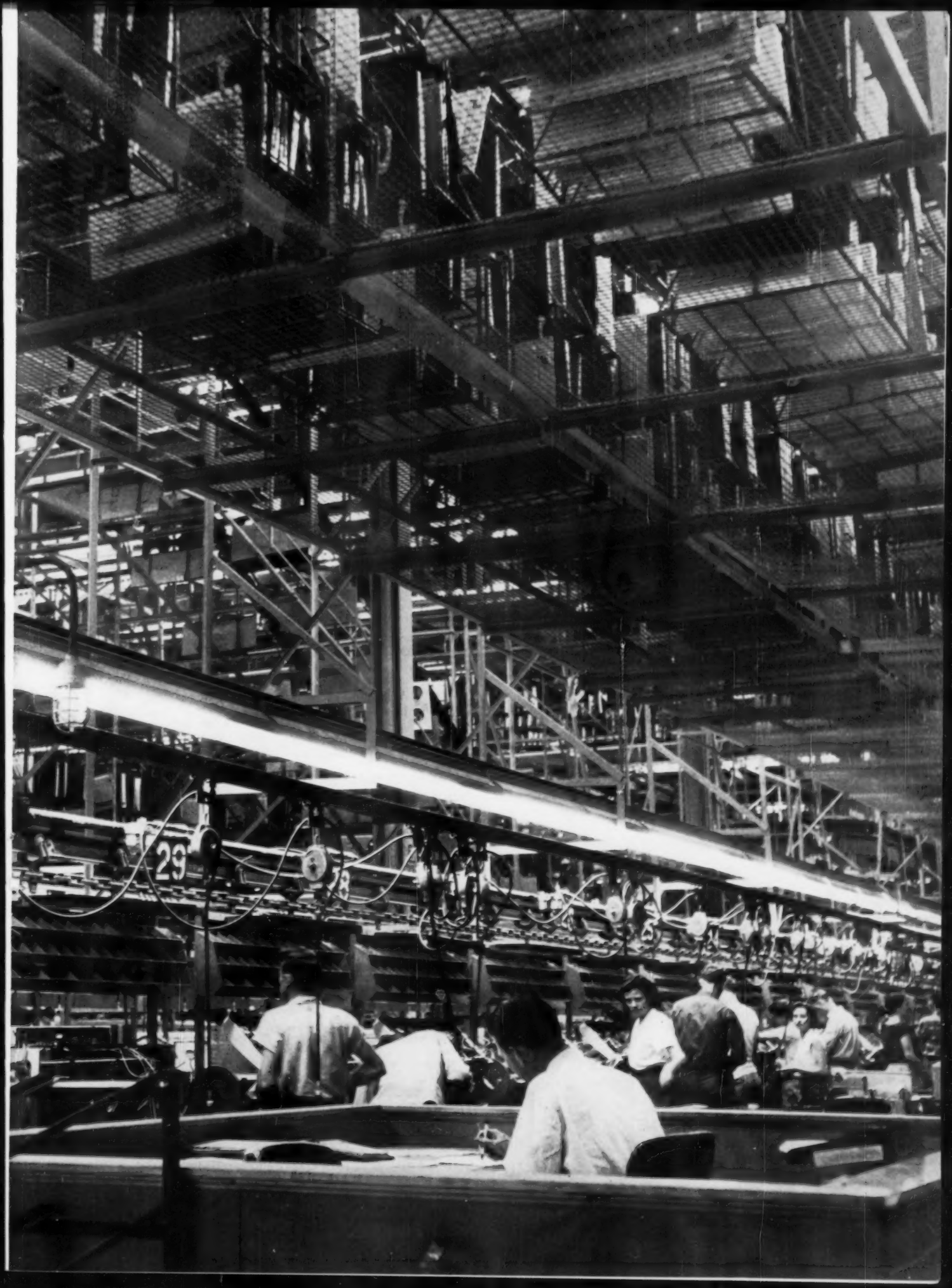
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in this issue...

Beckhard

Moser, Florence, Thurston, Blitzer

Dornier, Jr.

Muller-Munk

Nitsche

Richard Beckhard knows both in theory and practice what makes a meeting tick, and applies his knowledge of group problems and modern management to the subject of product planning on page 76. His background is theatre; he was assistant executive secretary of the American National Theatre & Academy, instructor at the American Theatre Wing before founding Conference Counselors, of which he is executive director, to advise industry and voluntary organizations on effective meeting procedures. Among his clients: Sylvania Electric Products, Inc., the Cancer Society, Ansul Chemical Co., Kenyon & Eckhardt. His book "How to Plan and Conduct Workshops and Conferences," was published last year.

Vice-President **William F. Blitzer** vis-à-vis his staff of Lightolier designers **Carl Moser, Noel Florence, Gerald Thurston,** who created the products we show, sets down company policy to guide design newcomers (page 108). At Lightolier since 1949, Blitzer has a BS in mechanical engineering, an MS in engineering economics, both from MIT. Carl Moser, sometimes called the dean of American lighting designers, has been a member of the design staff since 1928 and is today its chief. Chief of architectural lighting, Noel Florence designed the luminous ceiling now being installed in the Seagram Building, New York. He studied mechanical engineering in England (Birmingham) and fine arts at Cooper Union. In charge of residential lighting is Gerald Thurston, an industrial design graduate of the Chicago Art Institute. With Lightolier for ten years, Thurston is chairman of the New York chapter of IDI.

Although airplanes are his heritage, **Claudius Dornier, Jr.,** makes the pages (82) of ID as the designer of an economy-minded German car. The eldest son of the aircraft designer and manufacturer, Professor Claudius Dornier, he graduated from Munich University, worked as an engineering assistant with GM in Detroit and designed the Janus while heading the Dornier designing department in Madrid. He is now General Manager of the Munich plants of Dornier-Werke, maker of the first postwar German planes.

Fast-moving **Peter Muller-Munk** was in Paris in February to contemplate housewares for ID (p. 86), goes to Brussels the latter part of June to serve on an international jury assembled to award the Signe d'Or to the best industrial products of the Benelux countries. An authority on design abroad, he works with ICA on its overseas development program (ID, April '57), is head of ASID's Foreign Affairs Committee, spoke recently at Syracuse on design and foreign policy. His firm has just added the U.S. Steel Company to its client roster.

Erik Nitsche, a master in graphic design, has been art director, designer and photographer since 1929 for magazines, the movies, retail stores, record companies and industry from Switzerland to California and back to New York. On page 92 we present evidence of how he gave graphic substance to the atomic production and personality of General Dynamics. In this country since 1934, he has been awarded the Gold Medal of the Art Director's club (1949) and received an award from the American Institute of Graphic Arts yearly since 1951

FABRIC WITH "LUREX MM"†

For United Air Lines Interiors...

Designer Raymond Loewy selects luxurious fabrics highlighted by MYLAR®

Stronger, more durable metallic yarn ...another example of versatility found in Du Pont "Mylar"* polyester film

There's new luxury aloft in United Air Lines' ultramodern DC-7's, thanks to internationally known designer Raymond Loewy, Head of Raymond Loewy Associates. To complement the interior décor, Mr. Lowey selected a blue seat-cover fabric highlighted with sparkling gold metallic yarns made with Du Pont "Mylar" polyester film.

"When we were creating this décor for United," reports Mr. Loewy, "our primary function was to resolve a pattern of colors and shapes to provide functional comfort and eye-pleasing tones. Just as important, every material—every finish down to the last detail—had to provide long-lasting durability within a well-defined budget. That's why we selected seat-cover fabrics using gold metallic yarns made with 'Mylar'. These yarns provide a rich touch of luxury in areas of constant abrasion, flex, wear."

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CLIPS AND QUOTES

John Ely Burchard, *dean of humanities, M.I.T., in an address at the semi-centennial of the* **University of Michigan College of Architecture and Design,** *October* 25, 1956:

"There is no doubt that we live in an urban culture and one of the great ironies of our time is that we have come increasingly to fail as city builders, while perhaps improving as builders of buildings. Our cities become steadily uglier and less pleasant places in which to live—this in spite of the fact that we have approached a modern classic form for office buildings and factories, and perhaps another for schools and still another for churches, and in spite of the fact that our individual buildings are often very fine.

The city exists because it permits diversity of interest to be cultivated as it never can be in a village. For all this it exacts the perhaps necessary price of some crowding and the surely unnecessary price of too much noise, too many bad smells, too few trees and too little sky. If the city can't be urbane, then urbanism is lost.

If rewarding city design is to be more generally gained, it must rely upon a public abhorrence of what is ugly and a genuine yearning for and appreciation of what is beautiful. This abhorrence and this yearning can only be provided by education and training. If a nation is to want great architecture and great cities, it must have some comprehension of what great architecture and great cities are." "

Richard J. Neutra, *in an address at the* **Industrial Designers Convention,** *February* 15, 1957:

"We designers in the last analysis always work for human beings. Man, woman and child are our consumers. No other information is more basic to us than that on man, woman and child.

Dr. Maslow, of Brandeis University, is of the considered opinion that no motivation of any kind is free of elemental aesthetic ingredients. There can be no question that such ingredients are not at all additive or equal to additives, but that, as the word implies, such 'ingredients' are organically built into the matrix of the psychologically complex motive, inseparable from it, except perhaps for purposes of analysis and attempts at interpretation. As a happy amateur in psychology, I feel very enthusiastic about his view, which may sound solitary in our civilization of falsely defined 'Realism.'

All this puts a greatly heightened significance on the designer. Recognized or not as a 'shape monger,' he may be worse than a peddler of dope, worming his way into a group of innocents and minors. Not caught by the drug and food authorities, his arrangements of nervous stimuli are not poisons which one swallows, but poisons which one drinks in through those millions of orifices called sense receptors. This toxic stuff is served to us sufferers quite unnoticed in the midst of our urban jam, our jam of traffic, the jam of illumination and the ragged mountains and canyons of the auditive scene on Main Street. We must always remember the nine million know-how Americans who yearly have to cool their too hot heels in psychiatric waiting rooms, and we may conclude that our technological world of industrialized velocity might have something to do with our nervous disorders." "

ART & INDUSTRY

René Elvin, *in the British magazine,* **Design,** *April,* 1957:

"From the viewpoint of industrial design, America has several advantages over Britain. The most decisive is perhaps her eager acceptance of anything new as being, almost necessarily, a progress over the old. Most of us in this country are the true heirs of Mr. Hardcastle in Oliver Goldsmith's *She Stoops to Conquer* who, it will be remembered, loved 'everything that's old: old friends, old times, old manners, old books, old wines.'

It is not so much that America was in advance of us in the field of daring engineering feats: we rather than they were the pioneers.

But we did not go forward from our own pioneering designs in the way Louis Sullivan did in America, who was inspired by the steel structure of Brooklyn Bridge to devise the first skyscraper.

This was a highly important date in the field of American industrial design. Not that the first skycrapers were particularly beautiful: in fact, some of them were quite hideous, at least if judged by today's standards. But their architects truly built better than they knew. They developed a pride of achievement, a feeling of well-rewarded audacity that liberated new forces and fresh endeavors. Eventually, the skyscrapers of American cities attained a kind of imposing if utilitarian beauty somewhat comparable, in the Old World, to the defiant medieval towers of San Gimignano.

America, as we have seen, is thrice blessed in having not only the desire to create, but also the means to achieve her dreams and the talent to put them into effect, a talent largely home-grown, but fructified by all that is best in European genius." "

WALTER DORWIN TEAGUE
• • ASSOCIATES • •

Milton Immermann, *Walter Dorwin Teague Associates, in an address at the 48th Spring meeting of the* **Association of National Advertisers,** *March* 15, 1957.

"Packaging is no longer an exercise in graphic arts. Its present status reflects current and changing human needs and the expanding manufacturing capabilities resulting from our technical accomplishments. Therefore, the service that a package must perform is threefold: contain its contents in an economical form; provide protection throughout a wide range of changing physical environments; demonstrate its convenience through its form and graphic or design treatment which should reveal quickly what the package contains, what service it will perform and, of course, guide the consumer in the proper use of its contents." "

BUSINESS WEEK

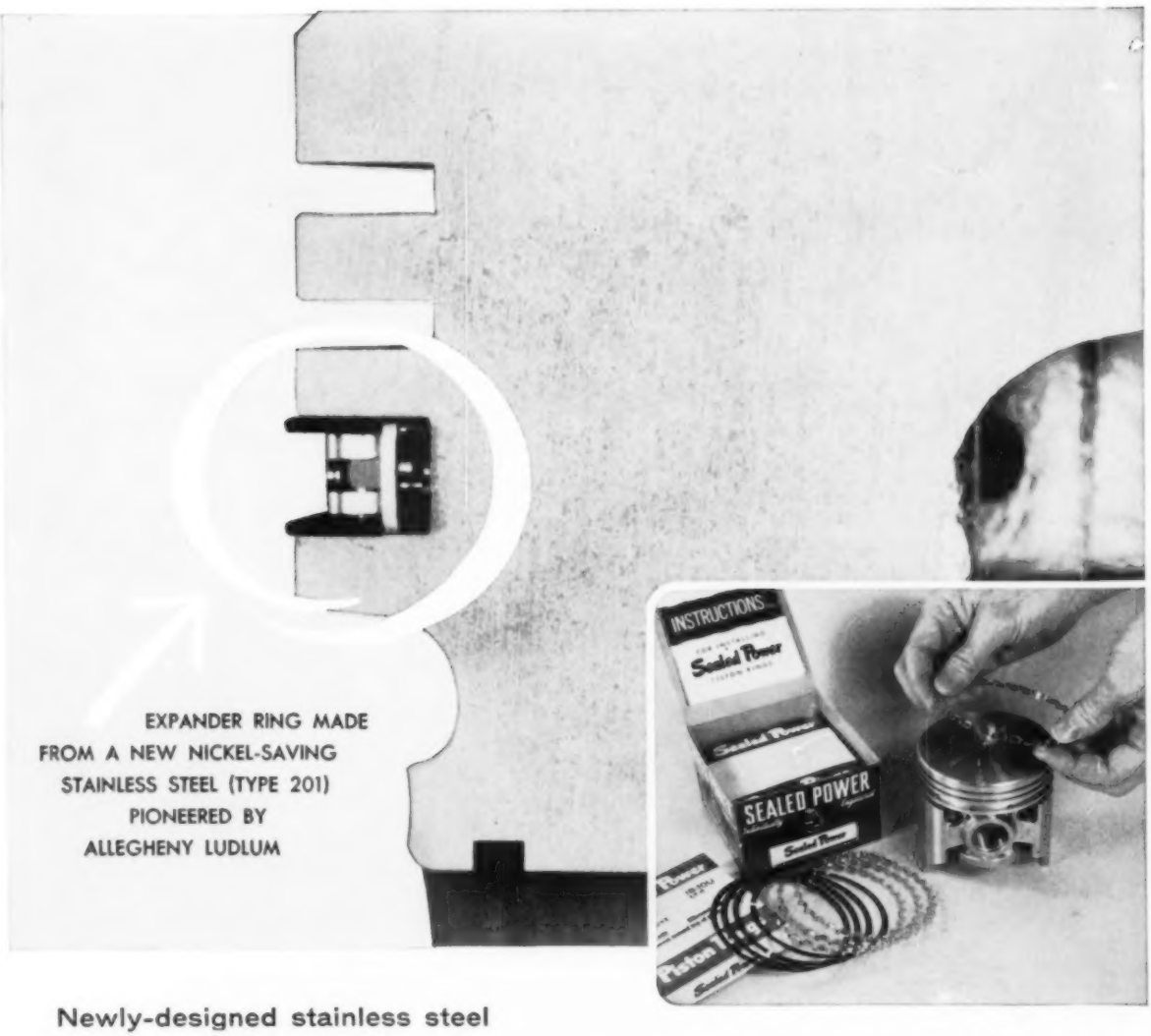
Business Week *discusses* **Detroit's Way of Making Cars Fit Many Tastes,** *in the April* 6, 1957 *issue:*

"'You don't mass-produce automobiles any more,' says a Detroit executive. 'You mass-produce parts.'

Not so many years ago, Detroit offered a standard, a de luxe, and maybe a super de luxe or 'custom' model in each line. Now the word 'standard' has dropped from the auto industry's vocabulary. If you want the least expensive, least powerful, least automatic, least chromed, and least-gadgeted car, you're buying a 'stripped' model.

Instead of dramatic new 'cars of the future,' you'll now see more new features sneaking into current models as optional equipment. It's more like buying a prefabricated house—you are offered a standard lot and foundation; then you choose your own floor plan and built-in equipment.

That's a long way from the days when Detroit offered even lights and bumpers as optional extras. Today's production strategy is: Make every brand of car sell to the broadest possible market." "



Newly-designed stainless steel

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Oil rings do a very demanding job in an automobile engine. They control the amount of lubricant allowed to pass up to the compression rings and cylinder walls. In modern cars, with higher compression ratios, the tension of the oil ring expanders has had to be increased—and that's where Allegheny Type 201 stainless offers advantages.

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This success story is just one of many being written with the new 200-series of low-nickel Allegheny Stainless Steels. Fabricating methods are virtually the same as with the higher-nickel 300-series, but you'll find some advantage in cost, and much greater availability in times of nickel shortage. • If these new steels seem to fit into your manufacturing or service picture, give us a call. ***Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.***

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INTERNATIONAL DIGEST

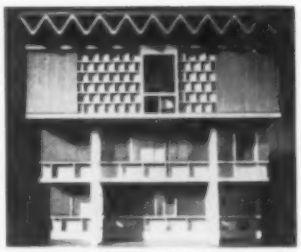
ENGLAND

Three-sided whisky bottle

DESIGN: May, 1957
Three sides to whisky: The square bottles of Johnnie Walker, the round ones of Buchanan and Dewar, and the peardrop bottles of Haig and Haig have now been countered with a new triangular bottle for Grant's Scotch Whisky. The new container, designed by Hans Schleger, appears so simple, so natural that one wonders why it was never thought of before. For its new bottle, the firm has received fan mail including a postcard: "Thank you, Mr. Grant, what a lovely bottle to put a ship in." pp. 24-25.

Collapsible suitcase

DESIGN: May, 1957
Travel goods: In a full length survey on luggage design, the requirements of modern travel and the use of new materials are examined. The molded fiber case, already in use on the American market, was introduced for the first time in Great Britain this year. Leather, still a leading material, is no longer the thick, heavy type seen before the war. One of the most unusual designs from Britain is a collapsible suitcase which packs flat in an envelope for storage. pp. 26-31.



U. S. Embassy, Baghdad

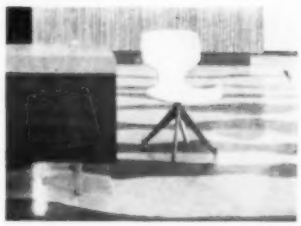
ARCHITECTURAL DESIGN: March, 1957
Ancient towns are being rebuilt and new ones springing up since the discovery of oil has changed the poverty stricken Middle East into an area of vast potential. A 36-page survey describes recent building by local and Western architects. The first section, devoted to city planning, describes British work at Kuwait, Basrah, and Baghdad. Ellen Jawdat discusses the new architecture in Iraq in terms of reconciling the architectural traditions of the past with the demands of the present. To meet the needs of an emerging middle class with money for building, Iraqi architects are searching for a truly indigenous expression for their country.
Other sections of the survey deal with educational plants and with new housing at Damascus, Kuwait, Cairo, El Ryadh, etc. pp. 72-108.

DENMARK

Chair by Peter Hjorth

MOBILE: March, 1957
Chair designs by Peter Hjorth, Preben Thorsen, Poul M. Volther, Erhard Rasmussen and others add up to a broad survey of current Scandinavian work in this area. Characteristic of the group is Hjorth's highly simplified, attractive chair consisting of two bent steel pipe legs plus a wooden frame. Many of the photographs suggest the careful planning, attention to detail, and sympathetic handling of materials that went into these chairs. pp. 3-29.

JAPAN



Office furniture

KENCHIKU BUNKA: March, 1957
I. Kenmochi, Japanese furniture designer, strikes out against the shortcomings of the furniture industry in his country. He finds that his colleagues are taken in by foreign praise of Japanese craftsmanship when, in fact, standards in Japanese mass produced furniture are much below those of other nations. Mr. Kenmochi says that quality would improve if designers had wider scope. pp. 38-41.

GERMANY

Cover art by Julian Palka

GRAPHIK: February, 1957
Polish posters: In recent years the Polish poster school has been ranked on a par with the schools in Switzerland and France. Illustrated here in vigorous style is a cover from *Poland*, cultural periodical published in six languages. pp. 22-23.

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NEWS

Norman Worrell, conference supervisor (rostrum). Panel members: C. K. Lovejoy, Scripto, Inc.; R. H. Koepf; W. D. Teague; Lewis Carrol, Rich's, Inc.; R. Spilman.

Southeast initiates regional design conference

The one-day Southeastern Industrial Design Conference at Georgia's Institute of Technology, on April 3, brought together a regional assembly of industrial designers and representatives from the firms they serve. Concurrently, a faculty-student-built design exhibit showed student projects from the Institute's Industrial Design Program, case histories of products designed and manufactured in the Southeast area—some of them redesigns, others new products with their growth traced through several prototypes—and an exhibit section devoted to consumer products such as radios and clocks from GE's Housewares and Radio Division.

The morning session of the Conference began with a keynote talk by Walter Dorwin Teague. He started with a definition—"The job of the designer is to reveal the content and quality built into products"—and went on to emphasize that industrial design is not a face-lifting or cosmetic endeavor, but should become an integral part of the product. Illustrating his remarks with slides of projects that his office is handling, he demonstrated that good design aids the public by making product recognition easier and by helping them to see its value. The trend in industrial design, he commented, is to design for permanency rather than for obsolescence: good design today will be good design ten or even one-hundred years from now.

Mr. R. H. Koepf, Manager of the Industrial Design Section of General Electric's Housewares and Radio Division, and Mr. Edward Ferrari, of the same Section, concluded the addresses of the morning.

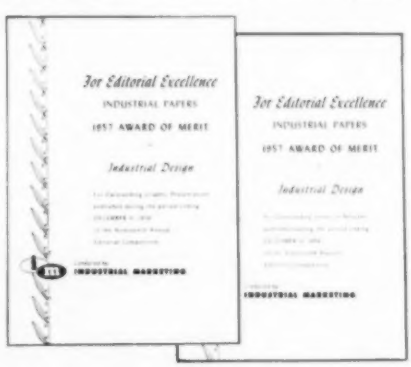
Mr. Koepf discussed the designer's position in a company, pointing out that the traditional organization has no feasible place in product planning for the designer. He suggested a circular table of organization with the designer a part of top management as new products are being considered for introduction.

Mr. Ferrari stressed the importance of the modelmaker in designing and said that at GE the ratio of designer to modelmaker is one-to-one.

The afternoon session continued the discussion of "The Designer's Role in Industry." Mr. Teague moderated a panel that included Mr. Koepf; Raymond Spilman, Chairman of the Industrial Design Advisory Committee at Georgia Technology; Charles K. Lovejoy, Vice President, Scripto, Inc.; Lewis Carrol, Merchandising Manager, Rich's, Inc.

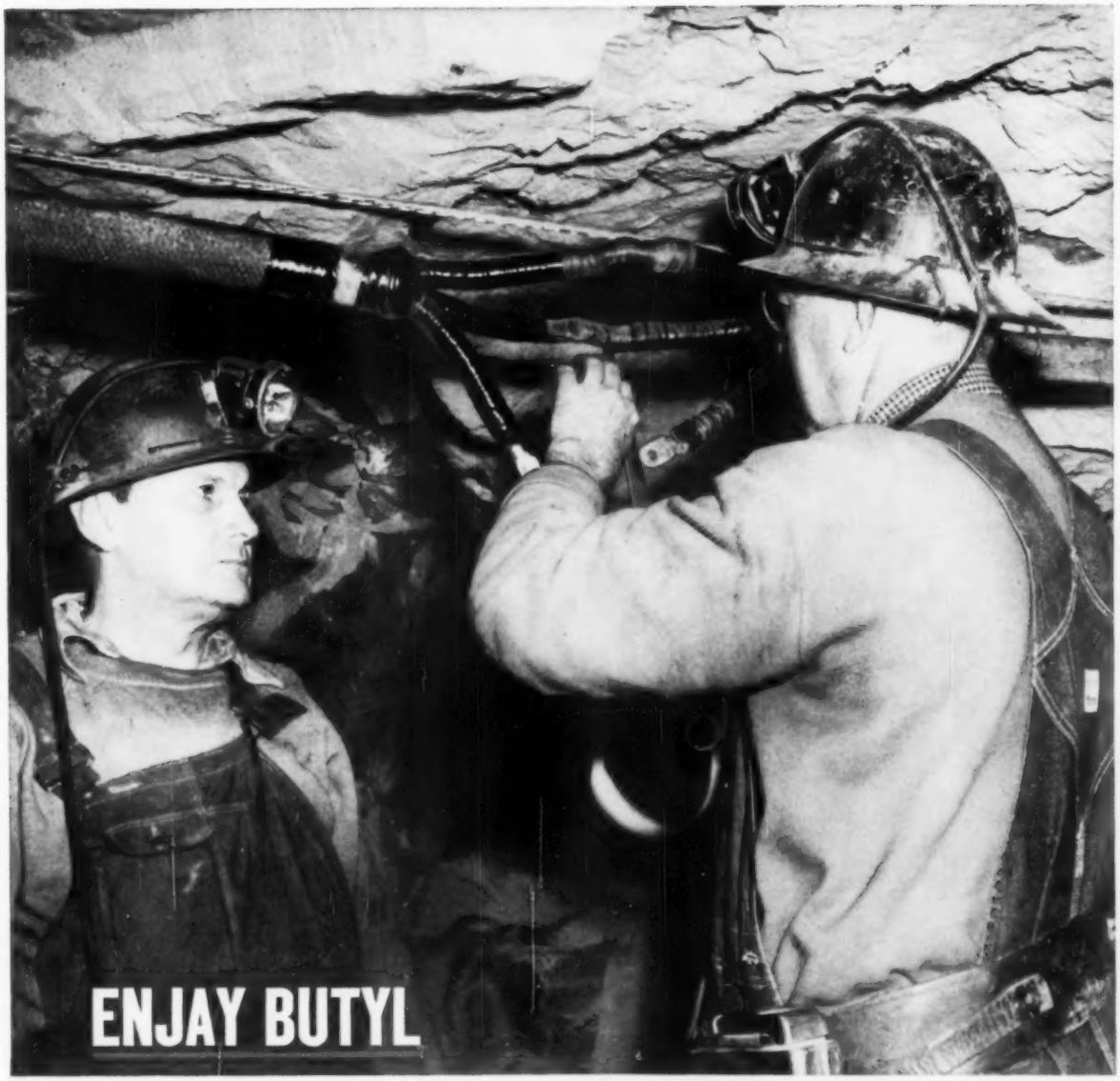
Editorial Competition Honors ID

In this year's Annual Business Paper Editorial Achievement Competition, sponsored by *Industrial Marketing*, INDUSTRIAL DESIGN won two certificates of merit in the Industrial category. One certificate in graphic presentation was awarded for a special



report on Midwest design in the October, 1956 issue. The second was for the series of articles, "Color Problems."

With nine awards in three years of publishing, ID now ranks 16th in a field of 600 for total awards won in the competition.



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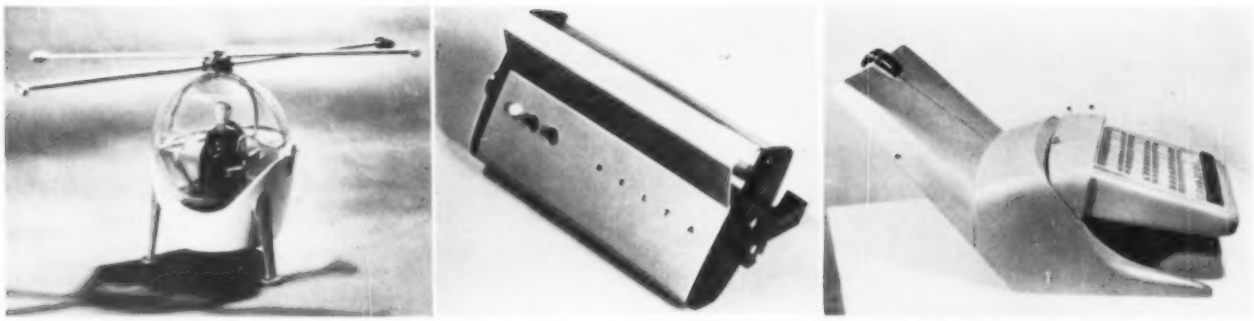


ASID award-winning student projects; vertical-takeoff helicopter, battery operated camping light, plastic typewriter.

Ten students receive ASID awards

For the second year the American Society of Industrial Designers has awarded prizes of fifty dollars for student designs—either sketches or models—judged to reveal originality, ability to define the problem, and competence in industrial design techniques. The results of this year's contest, announced by Raymond Spilman, Chairman of the ASID Education Committee, list the following winners from the ten projects submitted by each contestant: Donald MacIntyre, University of Bridgeport, a vertical-takeoff helicopter (see above); Alphonse Marra, from the same University, plastic typewriter with a new feed-in system for paper (shown above); Harry J. Brown, Gordon T. Guth, Robert S. Huff, William N. McDonal, Arnold M. Leib (see above for his battery operated camping light), all of the University of Illinois; Samuel J. Mann of the University of Cincinnati; Stanislav G. O'Jack of the Cranbrook Academy; Joe J. Ortega of the Chicago Institute of Art.

Yale to study U. S. "roadtowns"

A three-year research project on growing problems of the appearance and design of urban-rural fringe areas has been launched at Yale with a $67,600 grant from the Rockefeller Foundation.

Christopher Tunnard, Director of Yale's Graduate Program in City Planning, remarked that one of our greatest problems "is the improvement of interurban living in semi-rural areas. We will direct our research along the lines of design possibilities in developing these fringe areas. We will study the effect of man on his environment in these areas, including the conflict between building and agriculture, the impact of new throughways pushing through them, and the marked growth of so-called roadside commercial slums or fringe jungles."

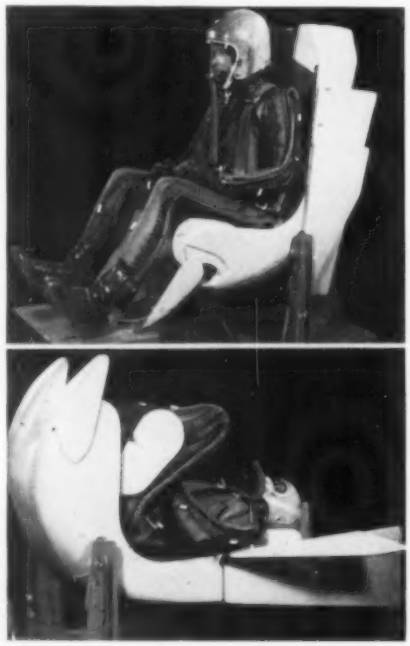
Announcement of the grant was made April 30, on the eve of a full-scale conference at Yale on "Interurbia,"—the urban strips which are emerging in several areas.

Bobsled ejection seat

As part of the Air Force program on pilot escape systems for supersonic aircraft, an aerial bobsled ejection seat is being developed under the direction of Convair Division of General Dynamics Corp. The new seat, which projects the pilot feet-first and on his back into the supersonic airstream, strikingly resembles the design of a bobsled, in operating position (see picture below). Full scale models will be tested shortly on the Air Force rocket sled tracks at Edwards Air Force Base, California, and at Hurricane Mesa in southern Utah.

Taking the pilot's place in a supersonic plane, W. G. Harwell, Manager of production flight for Convair (San Diego), seats himself in conventional posture (top picture) and is then rocked back into supine position, ready to be ejected in an emergency exit from the jet aircraft.

Before the supine pilot and his sled are ejected from the plane, foot scoops automatically pull the pilot's boots into firm position in stirrups. His shoulders, chest, arms and knees are braced against the seat to prevent flailing.



After an explosive charge from a small rocket motor, the seat travels upright on a rail for about nineteen inches, rotates pilot and seat into horizontal position and separates from the cockpit of the plane.

Detroit to be tool show center

With the opening of Detroit's Exposition Hall in 1960, the American Society of Tool Engineers is making plans to hold national tool shows there every other year. Under the new arrangement, ASTE tool shows will be held on an annual basis after 1960 with Detroit as the location every other year. Alternate cities will be Philadelphia and Chicago.

"The ASTE tool shows are recognized today as the major exhibition of production manufacturing equipment in the world," said Harry E. Conrad, Executive Secretary of the Society. In 1940, two years after the first tool show was held, the productive capacity of the country was at its prewar peak of $208 billion. Today it is around $400 billion, is expected to reach $500 billion in 1963 and nearly double that in 1975.

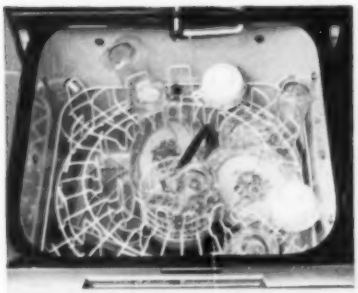
ASTE's next tool show will be held in Philadelphia May 1-8, 1858.

New means of food preservation

Normally perishable at room temperatures, meats, fish, fruits, and vegetables may now be kept on the shelf indefinitely without refrigeration through a new process announced by Raytheon Manufacturing Company.

The preserved food weighs only a fraction of the fresh product. This is because water, 70 to 95 per cent of fresh food's weight, is removed by applying microwave energy while the food is held under vacuum at below freezing temperatures. When the food is ready to be consumed, it is simply immersed in water to restore it to its original condition. Tests show no significant taste difference between this and conventionally preserved food.

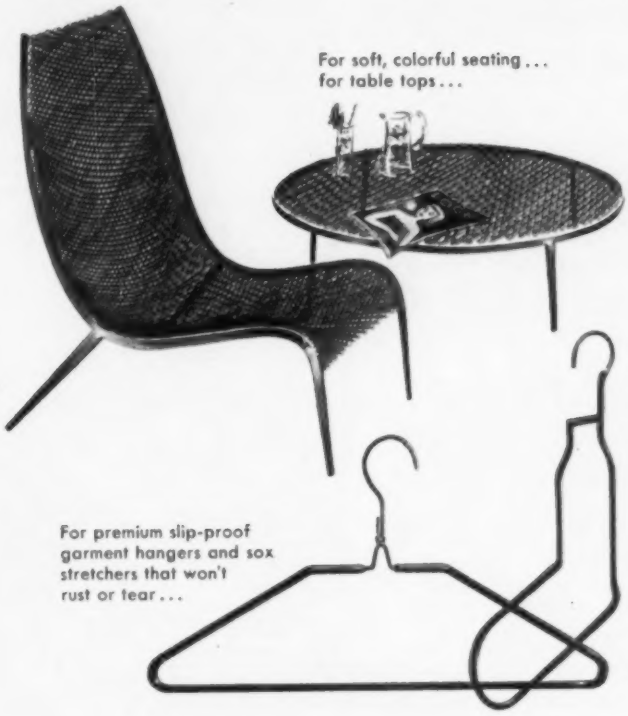
NEW WAY TO UPGRADE YOUR PRODUCTS: VINYL COATINGS



This lustrous vinyl-coated rack resists the scalding water and detergents of automatic dishwashing, prevents clattering and chipping of delicate china.

For bassinets, metal play pens, children's furniture...

For soft, colorful seating... for table tops...



For premium slip-proof garment hangers and sox stretchers that won't rust or tear...

For leather-like stair-well filler, protective screening...

Colorful, leathery coatings for wire and expanded steel

Tough leather-like coatings of vinyl can create profitable new markets for you with wire and expanded steel products. Colorful coatings up to 1/16" (60 mils) thick can be deposited on heavy wire, rod stock, or expanded steel in *one dip*. Or by *spraying* it on.

You can make the elastomeric coatings soft and rubbery—or as hard as tire casing. Make the finishes glossy, matte, or even *crinkled*. And in any color you choose. The characteristics of the final coating are determined by the formulation. After spray or dip application, a short heat cure "sets" the resin and permanently bonds it to the metal.

Write for sources of vinyl in liquid form for coating metal, glass, or wood. Get a head start on investigating the new, profitable ways to use wire and expanded steel—vinyl coated for resilience, color and premium appearance. Write today!

Organic Chemicals Division
MONSANTO CHEMICAL COMPANY
Dept. SP-1, St. Louis 1, Missouri

Monsanto manufactures a wide variety of plasticizers and Opalon® resins for formulators of these high-quality vinyl dispersions.

MONSANTO®

Where Creative Chemistry Works Wonders for You

A north elevation of the planned arts center for Dartmouth College.

Dartmouth merges arts activities

Dartmouth College has outlined ambitious plans for a combination social and cultural center which will create a crossroads of the arts on its campus. President Dickey hopes that the Hopkins Center will attract students to an everyday familiarity with music, drama, crafts, painting, all of which will be assembled and housed in the Center. The art studios will have glass walls making them visible to the loungers in the student canteen and it is hoped that this proximity to so much artistic activity will encourage the undergraduate to investigate, and participate in, these activities of the College.

The central goal of the design of the four-building Center is to "provide through architectural design and operating organization the greatest possible exchange of stimuli, ideas, and inspirations between artists, actors, musicians, and artisans." Plans for the Hopkins Center were executed by Wallace K. Harrison (the architect of the U.N. buildings and co-architect of Rockefeller Plaza) and include a theatre, lounge and social quarters, artists' studios and an interior garden. The contemporary architecture of the Center will be related in materials and scale to the other structures of the campus which are mostly 18th century provincial baroque.

Air-pressure alone supports the Airhouse

Frank Lloyd Wright Airhouse

As one answer to the home building industry's need for low cost movable houses, Frank Lloyd Wright has designed an experimental house entirely supported by air which makes use of U.S. Rubber's Fiberthin (fabric four times the strength of canvas but 40% lighter in weight). The same principle and material were recently used in a portable warehouse (ID, Dec. '56, p. 90). The Wright Airhouse—kitchen, living room, bedrooms, bath, all furnished by Herman Miller Company—was exhibited at New York's International Home Exhibition (May 4-12 at the Coliseum).

Life-size building exhibit in Berlin

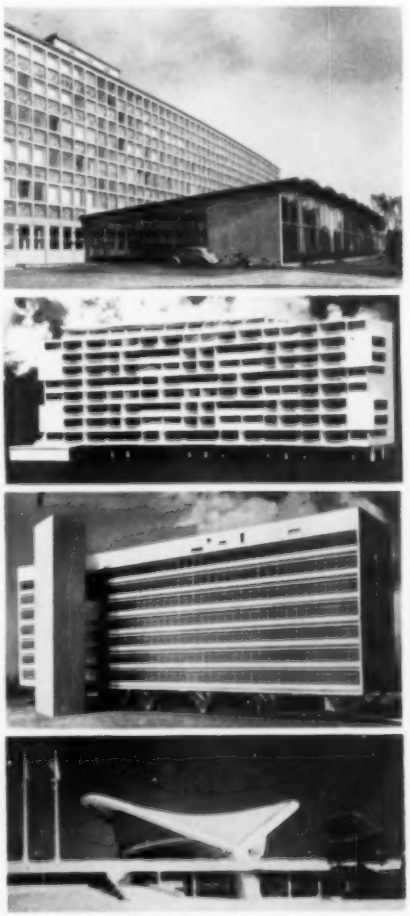
"The City of Tomorrow," a complete, full-scale reconstruction of the Hansa district of Berlin, almost totally destroyed in the war, will be open for inspection from July 6 through September 29, at the 1957 Interbau in Berlin. The Interbau city will serve as a laboratory where city planners, architects, builders, and decorators can put their latest ideas into practice. At the same time it will provide needed relief for Berlin's housing shortage.

The project will include 89 buildings with 1,169 housing units on an area about the size of 12 city blocks. Restaurants, stores, churches, parking facilities, playgrounds, a school, library, nursery, subway, and apartments will spring up in the new Hansa district. Architects, designers, city planners, and decorators from more than twenty nations are now at work on these buildings. Many pioneering concepts are expected since participants were limited by only three requirements: the location, purpose, and height of each project.

There will be ample opportunity for inspection. Some buildings will be only partly finished to show various stages of construction. Others, like the Congress Hall auditorium (right), seating 1,200, will be completed in time for the opening. Provisions have also been made to show visitors how decorators and landscape architects have solved their problems and how families have actually adapted to this experiment in contemporary living. Visitors will even examine the underwater tunneling operations for the new subway. Nearly finished portions of the tunnels will be served by electric sightseeing buses.

The International Building Exhibition will reach its climax during its final 16 days. At this time a complementary Interbau Industries Exhibition will be held at the Radio Tower fairgrounds. In addition, a special show, "The City of Tomorrow," will be staged in the Hansa district itself. A number of nations will offer displays on city planning and housing as annexes to this show. Shows by various West German Ministries—for example, an exhibition on reconstruction of war-devastated German towns—are also anticipated. Interbau itself will play host to some 40 professional societies which are scheduled to discuss areas of specialization ranging from air conditioning to zoning.

The whole Hansa project will be strongly international with participants coming from Brazil, Britain, Finland, Italy, the U.S.A. and more than 15 other countries. Chairman of the Executive Committee for Interbau is Dr. Otto Bartning, President of the German Architects Association.



Hansa buildings (from top down): library by Jobst and others, apartment by Gropius, apartment by Niemeyer, Congress Hall by Stubbins, all part of Berlin's Interbau.

A NEW PHENOLIC, SEMI-IMPACT MOLDING COMPOUND WITH IMPROVED WATER RESISTANCE AND DIMENSIONAL STABILITY

PLENCO 476

When exposed to water, steam, detergents and rust inhibitor environments, molded plastic parts can absorb as much as 6 to 8% weight. This causes dimensional changes of from 1.5% to 2.2%, and results in cracking or warping of parts.

Plenco's new formulation, 476, has greatly improved water resistance. After 120 hours of continuous boiling in a 3% commercial detergent water solution, Plenco 476 has a total moisture gain of less than 2%. Dimensional change less than 0.5%. An additional 240 hours of continuous exposure to boiling produced no further gain in weight or dimensional change.

SPECIFIC GRAVITY
1.38-1.40

IMPACT STRENGTH
0.35-0.39 ft. lbs. per inch of notch

TENSILE STRENGTH
6500-7500 psi.

WATER ABSORPTION GAIN
0.3-0.4% (ASTM)

DIELECTRIC STRENGTH
(S/T) 250-300 volts per mil

POWER FACTOR
0.04-0.06 at 1000 KC.

HEAT RESISTANCE
Excellent to 325°F. over long exposure

PLASTICITY
Soft to hard

PERFORMABILITY
Can be tableted with automatic equipment

Applications of Plenco 476 include such items as water pump impellers, blowers, vaporizers, humidifiers, agitators, dishwasher and washing machine components, etc.

P
PLENCO PHENOLICS
FOR BETTER PLASTIC PRODUCTS

PLASTICS ENGINEERING COMPANY
Sheboygan, Wisconsin

Serving the plastics industry in the manufacture of high grade phenolic molding compounds, industrial resins and coating resins.

Margulies, Helfgott, and Lippincott.

Package Research Conference

Research men, psychologists, and working designers joined forces to study the role of packaging in marketing at the first annual package research conference. Sponsored by Lippincott and Margulies, Inc., the conference was called to explore the ways in which scientific research and testing can be used to eliminate the guesswork in designing an effective package.

At the closing session of the conference Walter P. Margulies announced the formation of the Package Research Institute, Inc., to provide more precise information on market conditions as they affect packaging. Myron J. Helfgott, research consultant, will head the new organization. The Institute will include a laboratory for visual research as well as a national interviewing service.

People

Vic Erikson (left) has been appointed head of the Graphic Arts Design Department of Palma-Knapp Associates in River Forest, Ill.

Donald Q. Coster has joined Raymond Loewy Associates as special representative in sales development.

Warren W. Fitzgerald has been named assistant professor in the Design Institute of the Illinois Institute of Technology.

Three new trustees have been elected by the Ohio Valley Chapter to serve on the national board of the Industrial Designers Institute: **Leon Gordon Miller, Joseph Bowden** and **W. D. Riddle.**

The **Industrial Designers Institute** has just moved to 441 Madison Avenue, New York. The phone number remains the same: PLaza 3-8412.

John Carter, former vice president of Corning Glass Works, has been elected president of Fairchild Camera and Instrument.

Edward C. Levit, previously Research and Development Projects Supervisor of Whirlpool Corporation, has been made Director of Engineering for Yard Man, Inc., power lawn mower manufacturers, with responsibility for developing new products.

Frank Gianninoto of the industrial design firm of the same name, left for Europe recently where he will speak to International Sales Executives clubs in Zurich, Milan, Rome, Paris and London.

Donald Deskey Associates, industrial design consultants, have expanded their Client Service Dept. with the appointment of John C. Krueger, formerly a partner in the industrial design firm Paxton, Krueger and Associates; and Richard L. Pelzman, formerly vice president of Market Psychology, Inc.

William R. Brewer, I.D.I., has joined Channing Wallace Gilson, industrial design firm of Los Angeles and San Francisco.

Edward Klein Industrial Design is now located at 307 North Michigan Ave., Chicago 1, Illinois.

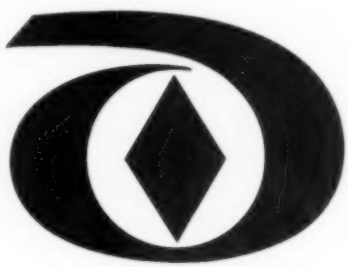
Peter Quay Yang Associates, Inc., announce that they have recently completed a redesign of the Salton Mfg. Company's "Hotray" and have been retained by Columbia Records to design a new line of hi-fi sets.

A new industrial design firm, **Russell, Ritchie and Lowe**, has been formed in St. Charles, Illinois. Eugene Russell and Donald B. Lowe were with Jon Hauser Associates; Douglas Ritchie taught at the Art Center School.

We note with regret the death of Oscar Bruno Bach, designer and craftsman in fine metals. Mr. Bach was well known for both his ornamental panels, which adorn many of New York's famous buildings, and for his metal work in association with such firms as Remington Rand, Inc. and Tappan Stove. Mr. Bach was the inventor of a process that gives color, corrosive, and abrasive resistance to ferrous metals. Among Mr. Bach's many honors, was the gold medal from the Architectural League of New York.

Company News

The **Diamond Alkali Company** of Cleveland, Ohio, have adopted a new trademark (see photo)—the design of Robert Dadmun and Associates of Baltimore, Maryland. This is the first step in Diamond's program to redesign its product package and labels.



Everyone has observed the increase in car window area in the past ten years. Figures from one major manufacturer show that front windshield area has more than doubled while rear windshield area has tripled during the post-World War II period.

The **Firestone Tire and Rubber Company** is building four new plants costing a total of about 30 million. This expansion is aimed specifically at raising their synthetic rubber output.

On the basis of many estimates, the automatic clothes washer and the electric refrigerator will continue to battle it out for first place in industry sales for the next ten years. The **Hotpoint Company** predicts that the industry will ship a total of 3,400,000 automatic washers and 3,800,000 refrigerators during 1957.

The **Dow Chemical Company** has doubled its capacity for the production of Styrofoam, the rigid plastic foam.

A proposal to merge the **Dixie Cup Company** and the **American Can Company** has been approved. Dixie is the country's largest paper cup maker.

The **Union Carbide and Carbon Corporation** has shortened its official corporate name to the Union Carbide Corporation.

The **Pennsylvania Salt Manufacturing Company** has changed its plus-100-year-old name to Pennsalt Chemical Corporation to reflect the present day activities of the company.

General Motors produced a total of 272,693 motor vehicles during April. Production last year for April was 359,178.

Correction

On page 105 of the May issue it was mistakenly noted that a spectrophotometer designed by Eliot Noyes was for Baird-Atomic, Inc. The design was actually for the Perkin-Elmer Corporation and the price should have been $3850.

where you need high-impact strength and low-pressure moldability use

Boltaron®

formable plastic sheet

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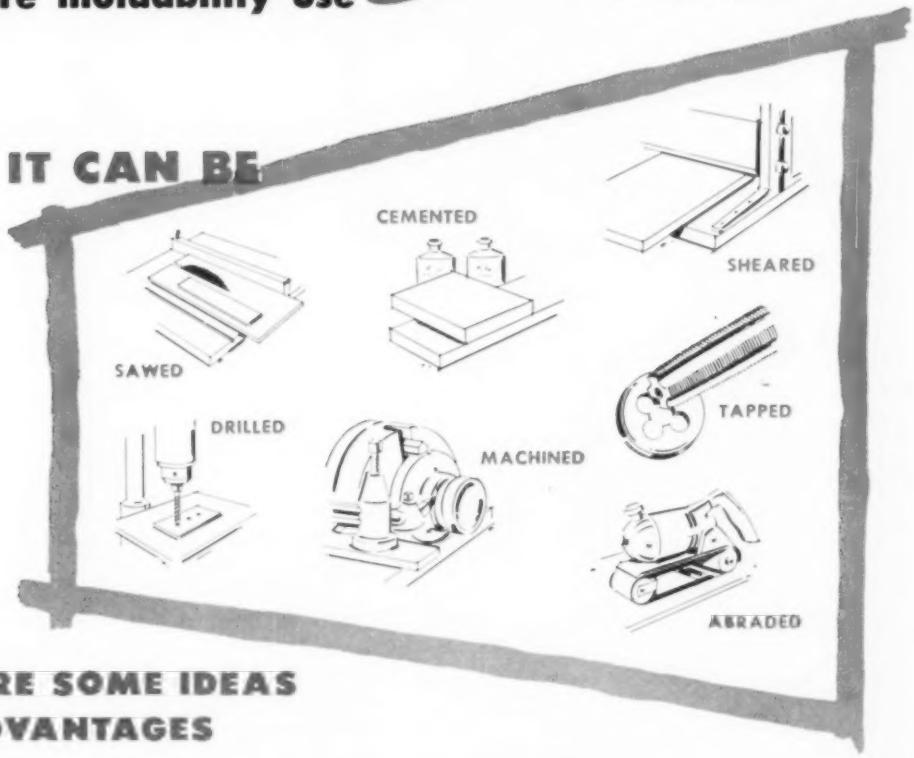


HERE ARE SOME IDEAS AND ADVANTAGES

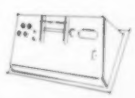
Light weight...handsome luggage with realistic leather finish is strong and sturdy.

Protection . . . tough covers for machines. Practically stainproof.

Impact resistance . . . safe, shock proof tote boxes withstand rough handling, protect delicate parts.

Abrasion resistance . . . fender guards resist kicking, scraping without loss of color or finish.

Rigid-rugged . . . special finishes and colors make Boltaron ideal for plane and auto trim.



Low tooling costs . . . die panel is strong, rigid holes can be routed after forming.

Low water-absorption rate . . . lightweight, chip-proof sinks will not absorb juices or dyes.

Boltaron is a high-impact strength, low-pressure moldable sheet material that combines many of the advantages of both plastic and rubber. It can be formed with low cost molds of wood, metal or composition material . . . can also be vacuum molded or simple plug and ring forming techniques can be used. Withstands blows that would shatter or dent metal castings or sheet metal. Can be produced in most any color or finish.

For complete booklet giving full information including properties, use coupon at right.

THE GENERAL TIRE & RUBBER COMPANY
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GENERAL® PLASTICS
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Company _____

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Designing with BAKELITE Plastics

- *Colorful new coating needs no primer*
- *Flexural strength of vinyl hinges*
- *Durability plus chemical resistance*

The variety of BAKELITE plastics and resins gives you a valuable range of properties to work with in designing your product. These features can often lead the way to ideas for new products, or to new improvements. So it's shrewd planning to keep informed on the latest developments in plastics—to be sure of what you, or your competition, might put to good use.

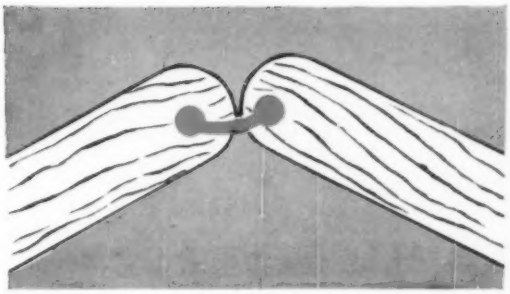
Here are some applications of materials made by Bakelite Company—a leader in the plastics field for 46 years. BAKELITE Brand Plastics and Resins include Phenolics, Styrenes, Vinyls, Epoxies, Polyesters, Polyethylenes, Silicones, and Impact Styrenes. In applying these modern materials to your own requirements, you can call on the extensive experience, laboratory facilities, and technical resources of Bakelite Company. Send full details to Dept. YD-80 for a thorough evaluation of your problem.

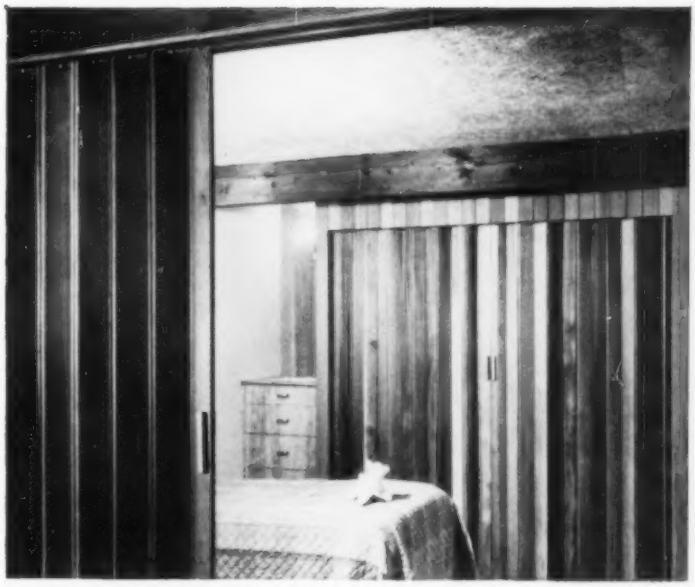
1 Molded phenolics get brilliant color at low lost

Phenolic plastics have long been noted for their economy and useful properties. But when bright color in broad range was needed, other materials had to be used . . . at higher cost. Now, a new coating based on BAKELITE Brand Epoxy Resins provides excellent hiding properties in a single coat. It adheres well with no primer required. Thus, you can still gain the production economy and quality performance of phenolic moldings, and have any hue of the rainbow as well.

This new enamel adheres not only to the glossiest phenolic surface, but equally well to steel, tin, brass, copper, aluminum, glass, wood, and many other plastics. It has excellent resistance to heat, corrosion, abrasion, and impact . . . can be high-gloss or flat in a wide variety of colors. Write Dept. XS-80 for copies of BAKELITE Coatings Technical Releases No. 15 and 16 for a description of epoxies for coatings.

See the difference . . . both black and brown phenolic molded articles can be given new color in a single coat without a primer. Adhesion test (inset) shows a coated copper strip cut with scissors and twisted vigorously. Finish does not crack or peel away from the base material.





2 Strong, silent hinges for folding doors are extruded from elastomeric vinyl plastic

Full-length, one-piece hinges extruded from BAKELITE Brand Elastomeric Vinyl Plastic connect the panels of these folding doors. The manufacturer put them through 250,000 opening and closing cycles. They operated with friction-free smoothness; no squeaks, and no failures. The tough vinyl strips don't tear while being inserted, even though they are pulled through undercut grooves in the panel edges and their H-shaped cross section is formed for a tight fit. In addition, their flexing area is precisely the right thickness for proper functioning.

Another advantage of vinyls is resistance to household cleaning materials, waxes, paints, varnishes, and lacquers. Their color variety permits hinges to harmonize with the panel woods. For further information, write Dept. XT-80

3 Tough, chemical-resistant C-11 plastic helps improve battery design

A frame molded of BAKELITE Brand C-11 Plastic forms the open top of the "EVEREADY" CG-500 railroad signal cell—an air-depolarized cell. It also holds the carbon-grid cathodes, exposing their inside surface to freely-circulating air, and supports the zinc-plate anodes. The whole assembly is suspended in a jar of 30 per cent potassium hydroxide liquid electrolyte. Operating temperatures can range from minus 20 to plus 80 deg. C.

The combination of properties found in C-11—mechanical strength, molding accuracy, dimensional stability, and chemical resistance—may be just what your designs call for. Versatile C-11 Plastic also matches industrial applications like this with benefits in the packaging and housewares fields, where it offers color, transparency, and resistance to attack by many food chemicals. For details, write Dept. XU-80 and ask for "Molding News," Vol. I, No. 4.

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PLASTICS

POLYESTERS • EPOXIES
PHENOLICS
IMPACT STYRENES
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** Both won awards as the best single issue in Industrial Marketing's annual Editorial Achievement Competitions.*

3rd in INDUSTRIAL DESIGN'S series on GREAT AREAS OF DESIGN, OCTOBER 1957

In keeping with its interest in making major regional reports, INDUSTRIAL DESIGN will devote more than 50 pages of its October, 1957 issue to the story of California—one of America's great industrial frontiers.

The West Coast, with Los Angeles and San Francisco as focuses, is one of the nation's big industrial frontiers: an area where industries spring up over night, where basement operations become big business, where innovation and invention and new ideas are what pay off. The meteoric expansion of the area is suggested by the fact that in the last decade Los Angeles has moved from 20th place to the nation's third largest manufacturing center.

California's industrial growth is focused on these major industries: all of these are fast-moving distinctly post-war industries, all pointing to the future of product and industrial development.

Aircraft and aircraft parts.
Instruments.
Electronics.
Office machines.
Aluminum.
Missiles.
Solar energy.

California is also a design frontier in architecture, furniture, appliances, stone, clay and glass products. Many national design trends have originated here since the war, and continue to spring up.

What accounts for this apparently unlimited frontier?

Where is it going?

What part does design play?

In its October report, INDUSTRIAL DESIGN will again develop a significant close-up of a region whose direction is affecting industry everywhere. INDUSTRIAL DESIGN for October, featuring this significant close-up of "Design on the West Coast," will be essential reading for all active Industrial Designers and executives throughout industry who are concerned with product design, development, and marketing.

You and your associates will want to read INDUSTRIAL DESIGN in October. The subscription card in the back of the magazine, mailed today, will start a subscription at once and assure delivery of the October issue.

PROPERTIES THAT MAKE FORTICEL A MORE DESIRABLE PLASTIC

Flow temperature: (°C.) (A.S.T.M.)	D569-48	167—178
Specific gravity	D176-42T	1.18—1.21
Tensile properties:		
Yield (p.s.i.)	D638-52T	3380—5020
Break (p.s.i.)	D638-52T	3470—5240
Elongation (%)	D638-52T	56—66
Flexural properties:		
Flexural strength (p.s.i. at break)	D790-49T	6400—8500
Flexural modulus (10^5 p.s.i.)	D790-49T	0.23—0.30
Rockwell hardness: (R scale)	D785-51	62—94
Izod impact: (ft. lb./in. notch)	D256-43T	2.7—11.0
Heat distortion: (°C.)	D648-45T	59—70
Water absorption:		
% sol. lost	D570-42	0.00—0.08
% moisture gain	D570-42	1.5—1.8
% water absorption	D570-42	1.6—1.8

AMERICAN OPTICAL *selects* **FORTICEL**

new Celanese propionate thermoplastic to personalize its Cool-Ray Polaroid Sun Glasses*

More and more manufacturers, designers and molders are turning to Forticel for its unique balance of properties – for its excellent moldability, superb surface finish, high impact strength – qualities that improve finished products, cut finishing operations.

Personal items, like American Optical's Cool-Ray* Polaroid Sun Glasses, derive immeasurable advantage from Forticel's freedom from objectionable odor. When Forticel-molded items are packaged or carried in a personal handbag, no objectionable odor is present to concentrate or build up. Products made of Forticel are virtually odorless – and remain so!

More and more famous name companies are discovering that Forticel's toughness and high speed moldability – its big plus combination of better dimensional stability, excellent form retention, and particularly its freedom from unpleasant odor – are properties that can be counted on to give products an important competitive advantage.

If you haven't evaluated Forticel, we urge you to do so. You will then understand why Forticel is being written into an increasing number of specifications.
Celanese Corporation of America, Plastics Division, Newark 2, N. J.
Canadian Affiliate: Canadian Chemical Co., Limited, Montreal, Toronto, Vancouver.

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*T.M. Reg. by Polaroid Corp.

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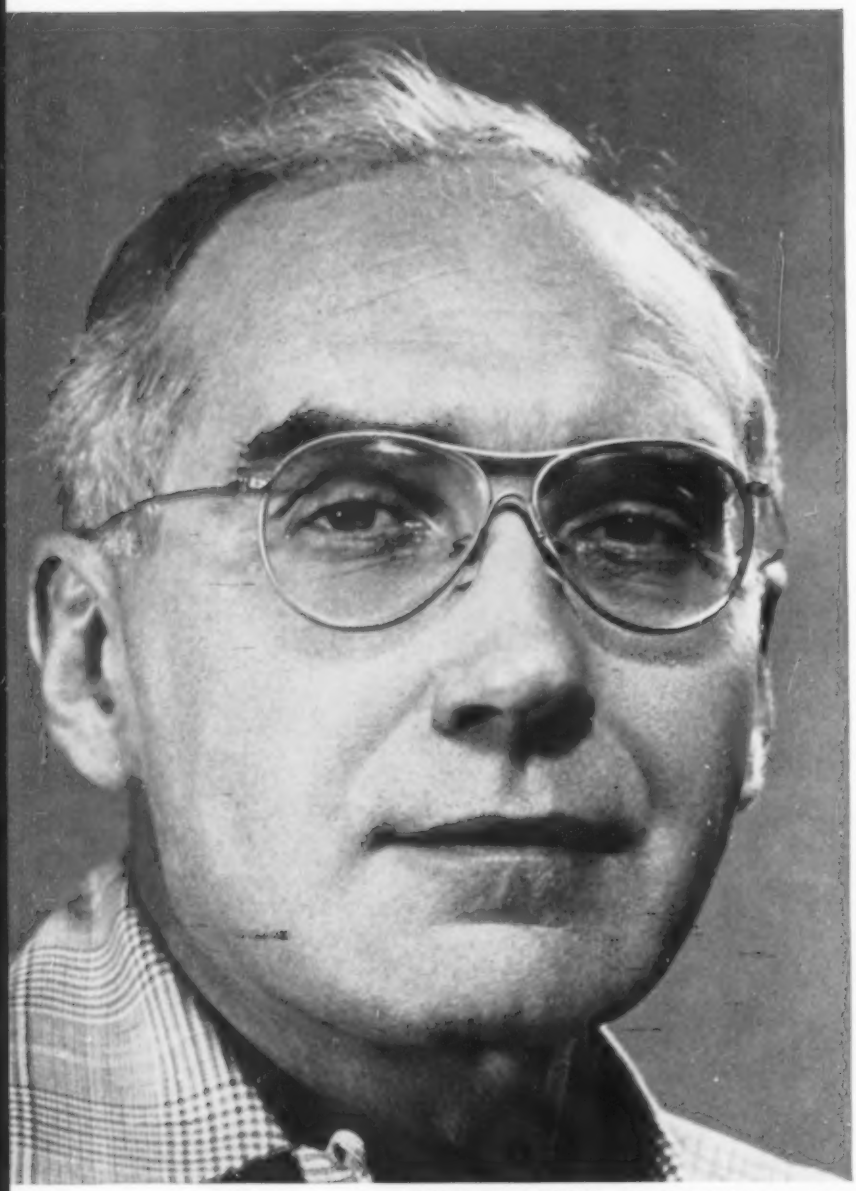

RUSSEL WRIGHT, F.A.S.I.D., New York, looks into the future.

The sleek good looks and complete practicality of this man's disposable talcum box were made possible with high-impact Styron. Top swivels one full turn to expose opening.

Styron is first choice of molders for accurate, authentic duplication of the real thing in popular hobby model applications. This box car is less than six inches long!

New dimension in design: colorful Styron

"The realization that color is the new dimension in modern design . . . is spreading throughout American industry," says Mr. Wright.

With Styron® (Dow polystyrene), you pick and choose from 3300 colors, either opaque or crystal-clear. Finished products are printable with a variety of colors. With such exclusive advantages, it's no wonder that Styron can help you realize your most advanced designs.

"The industrial designer's main function," Mr. Wright says, "is . . . to sell the consumer . . . on what the manufacturer can produce."

Because of its many formulations (11, to be exact), Styron meets the requirements of more applications – for more sales. Because Dow continually introduces improvements in both materials and methods, Styron is your first choice for advanced design – to create more sales. And because Dow offers invaluable services for solving particular problems, Styron has an exceptional record for problem-free applications–for more sales.

Whether your problem concerns material, tooling or product application, we invite you to phone or write THE DOW CHEMICAL COMPANY, Midland, Michigan–Plastics Sales Department PL1590L.

America's first family of polystyrenes

GENERAL PURPOSE
- STYRON 666
- STYRON 665 (Extrusion)
- STYRON 688 (Easy Flow)
- STYRON 689 (Easy Flow)

HIGH IMPACT
- STYRON 475
- STYRON 777 (Medium Impact)
- STYRON 440 (Heat Resistant)
- STYRON 480 (Extra High Impact)

HEAT RESISTANT
- STYRON 683
- STYRON 700

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Faucet handles for wash basins, showers, baths and lavatories fabricated in transparent LUCITE represent the latest in fixture styling and engineering. Strong, sparkling LUCITE combines with the smooth, snap-on chrome top for long-lasting beauty in modern bathrooms. (Fixtures by Crane Co., Chicago, Illinois, for their distinctive "Criterion" lavatory.)

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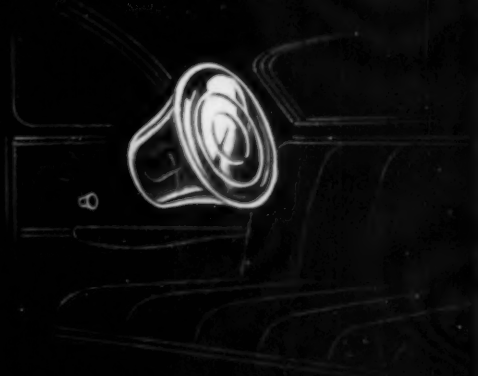
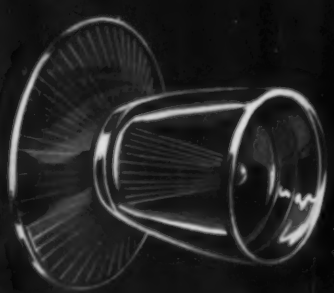
acrylic resin

A modern material for modern design



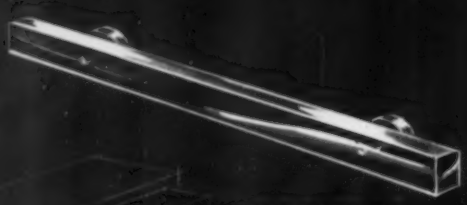


AUTOMOTIVE

Attractive window and dash knobs of LUCITE will retain their beauty and form even after years of use. LUCITE is also used for other automotive applications such as medallions, tail and parking lights . . . is unaffected by aging, sunlight or moisture.

HARDWARE

Distinctive designs for doorknobs and other hardware items are possible with LUCITE. Though light in weight . . . one third the weight of glass . . . hardware items of LUCITE exhibit remarkable impact strength and durability.



FURNITURE

Readily molded in complex shapes, LUCITE provides a great number of possibilities for furniture designers and manufacturers. Sparkling LUCITE contrasts beautifully with all pieces . . . resists scratching . . . will not become cloudy during long periods of use.

• Beautiful, durable Du Pont LUCITE acrylic resin provides a new decorative way to handle a great variety of design problems. Readily fabricated, LUCITE acrylic resin allows the design engineer greater freedom . . . permits a wider range of shapes and styles. The knobs shown here illustrate the modern designs possible with LUCITE.

LUCITE has a unique combination of properties, making it adaptable to an extremely wide range of uses in both industrial and consumer fields. For signs and displays, LUCITE gives durability and excellent resistance to aging, sunlight and moisture. Its optical properties and shatter resistance make it particularly advantageous for lighting applications. Industrial designers benefit from its lightness of weight, transparency and chemical inertness. LUCITE acrylic resins are available in a variety of beautiful colors . . . no matter which you choose, the sparkling clarity of LUCITE adds beauty to such items as household fixtures, appliances, ornaments, jewelry and personal articles.

Let us help you evaluate the remarkable properties of LUCITE in terms of your own designs! For more information write to E. I. du Pont de Nemours & Co. (Inc.), Polychemicals Department, Room 906, Wilmington 98, Delaware.

In Canada: Du Pont Company of Canada (1956) Limited, P. O. Box 660, Montreal, Quebec.

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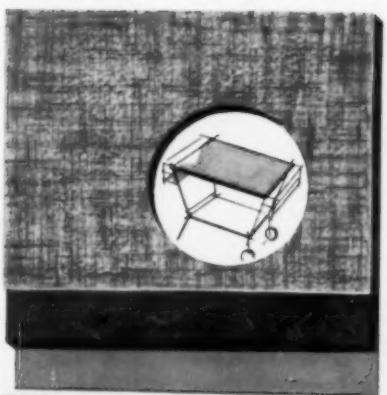
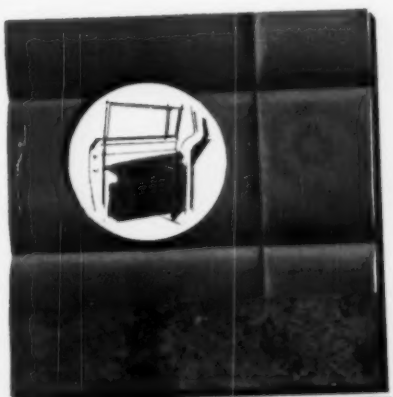
Expensive, exotic woods, veneered to Masonite panels, now enrich the value of many home and office furnishings—efficiently and economically. A designer's delight!

From metal to paper–Plastics to wood–Your best base for laminates



Plastic laminates, in linen, wood grains and a variety of other finishes bonded to stable Masonite® panels, create new standards of beauty and usefulness.



Many special laminates—vinyl, cloth, paper—may be bonded or fastened to these even-structured Masonite panels—the only complete line of hardboard...a type, thickness and size to meet your production requirements.

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FOR OUTSTANDING EDITORIAL ACHIEVEMENT

This month INDUSTRIAL DESIGN received two awards in *Industrial Marketing's* 19th Annual Editorial Competition.

A total of nine awards in only three years of publishing. Out of approximately 600 annual entries INDUSTRIAL DESIGN has the unique distinction of being among the top sixteen in total awards won. This is a remarkable editorial achievement considering many of the publications have been entered for almost nineteen years.

A positive sign that INDUSTRIAL DESIGN is doing its job well . . . giving its readers what they want and need in the best editorial form . . . covering the industrial design field for the nation's active industrial designers, and executives throughout industry who are concerned with product design, development, and marketing.

two more awards for INDUSTRIAL DESIGN

Awarded for the series featuring "Color Problems" appearing in the February, April, June and August 1956 *issues of INDUSTRIAL DESIGN.*

Awarded for the October 1956 *issue of INDUSTRIAL DESIGN featuring "Midwest Design: The Chicago Area."*

THIS IS GLASS

a bulletin of practical new ideas from Corning

New, neat way to heat

You can't buy this heater, *yet*. It's new—in fact so new in concept that what you see is a preliminary design sketch.

What makes it so unusual is the heating element it is designed around. Corning's *new* tubular heating element called HEAT SHEATH®.

This is what the basic unit looks like.

Essential components are: VYCOR brand glass tubing, colored *red;* capped leads; and a completely enclosed, extremely efficient wire heating element.

True . . . sheathed heating units are not new. But HEAT SHEATH offers a *combination* of important advantages to you who seek a compact, efficient, versatile source of heat.

Let's start with the glass tubing. It's made of a VYCOR brand glass that contains 96% silica. And silica in such amounts gives this glass the ability to cope with the usually adverse effects of both *high temperatures* and sudden *thermal shock*.

For example: You can take an object made of a VYCOR brand glass, heat it to 900° C., and then plunge it into ice water *without* cracking, crazing, shattering, or any change in form.

Next, consider the freedom of design this tubing offers . . . and how little space it requires. (O.D. is $\frac{5}{8}$".) With a tentative rating of 500 watts per linear foot, you can provide desired heat with short sections "banked," or long, single units.

These units heat up fast, too, going from room temperature to maximum rating within 5 seconds. The warm red coloring is right in the glass—it can't wear out or off. (Note: Specific shade depends on wattage input and varies from a deep red to a cheerful ruby glow—colors that add *psychological* value to the heat.)

Naturally, the glass enclosure protects the heating element from dirt, dust, and accidental shorting. Fire hazard is reduced to zero. And the heating element itself has a life rating of 5,000 hours, *plus*.

Not interested in portable heaters at the moment? How about laundry dryers, broiling units, baseboard heating, air conditioning, industrial dryers? Maybe you've already thought of other possible applications.

If you're interested in finding out more about this compact, attractive, versatile, and challenging item, contact our Appliance Parts Sales Department. Write, wire, or phone.

Afterthought: There are 7 different glasses in the VYCOR brand group. We have a booklet that tells about them, gives details on thermal characteristics, radiant energy control applications, and such. The booklet is Bulletin B-91. Free with the coupon.

On the level

This intriguing (though difficult to show to advantage) bit of gadgetry is part of a *turn-and-bank* indicator for airplanes.

We don't make such instruments. We do supply the glass tubing, made from one of our PYREX brand glasses.

Those who do fashion instruments of this type find Corning a reliable, economical source for this tubing. Besides being free from visual defects this tubing is rugged, accurate and easily worked.

Astute makers of many things have discovered the practical and profitable road to glass components. They bring their wants to Corning.

The list of items and special glasses involved almost defies enumeration. (There are some 65,000 glass compositions in our files.) But a good start is a pleasant book called "This is Glass." Free. And/or drop us a line briefing your problem and we'll investigate and report promptly.

How to prevent TV sunburn

Those who perform in front of TV cameras are occasionally subjected to an occupational hazard called "television sunburn."

Cause of this unsought skin tinting is the intense heat generated by the big lights used to illuminate sets.

Now set the stage for another problem: Telecasting during the *summer* from a barn-like structure that has defied every effort of those versed in the art of air conditioning.

This "*double trouble*" is what the producers of a popular show, called "Grand Ole Opry," faced last summer. Putting the show on from Ryman Auditorium in Nashville, Tennessee, loomed as quite an ordeal.

Enter here a sensitive and knowledgeable person. His suggestion: Try PYREX brand infrared reflecting glass.

Sheets of this glass were placed in front of the lights with simple brackets. Here's what the setup looked like:

Heat output was reduced some 50%. Yet this PYREX brand infrared reflecting glass still transmitted 75% of the wanted light.

Conclusion: Where there's a knotty problem you'll often find a Corning glass to solve it. A number of good examples are detailed in Bulletin PE-34, a concise reference on infrared, sight glasses, flat glasses and sundry other useful items. A check in the coupon brings it to you.

Corning means research in Glass

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Please send me the following material: Bulletin B-91, "VYCOR brand Industrial Glassware by Corning" ☐; Bulletin PE-34, "Corning Flat Glasses" ☐; Illustrated booklet, "This is Glass" ☐.

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PLASTICS NEWSFRONT

EYE-LURING COLOR CAPS BEST-SELLING PACKAGES

To compete for attention on crowded toiletry counters and shelves today, many best-selling products add a cap of colorful BEETLE® Urea Molding Compound. The beauty of color—any color—is permanently molded in. Closures of BEETLE Plastic are practical, too: they resist alcohol, acetone and other solvents, resist staining, and don't have an electrostatic affinity for dust, so stay clean longer on shelves.

NEW PIPE JACKET STOPS UNDERGROUND CORROSION

Strong jackets of spirally wrapped glass cloth and LAMINAC® Polyester Resin combat corrosion in new prefabricated insulated pipe conduit for underground steam and hot-water systems. Developed by Temploc, Inc., Baldwin Park, Calif., the protective two-ply shell is much lighter, less costly and more corrosion resistant than conventional steel or tar-protected conduit. Insulation is sealed and vapor-proofed at the ends by bonding the cloth-resin shell directly to the bare pipe. Field joints of insulation, cloth and resin are easily applied at the site.

IMPROVED HOUSING FOR NEW pH METERS

To make the housings for Pocket model and ZER O MATIC* bench model pH meters (shown) unusually strong, impervious to chemicals and resistant to scratching and chipping, Beckman Instruments, Inc., molds them of CYMEL® 1077 Melamine Molding Compound. This tough, break-resistant plastic protects the delicate mechanism and also provides the attraction of color without the added production steps required in finishing metal. Color is part of the housing itself; there is no coating to wear or chip off . . . no metal to corrode. *Trademark Beckman Instruments, Inc.

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NO. 3 OF A SERIES

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using H&K perforated metals

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The design, pattern and open area for almost every application may be selected from our thousands of perforating dies . . . at no charge for tooling. (If a special design is required, tools will be built to order.)

Harrington & King can perforate practically any material that can be obtained in coils, sheets or plates . . . from foil-thin to 1" thick. Metallic materials—steel, aluminum, stainless steel, brass, copper, monel, zinc, bronze, etc. Non-metallic materials—plastics, wood composition, paper, cloth, etc.

Fill in and mail coupon to nearest H & K office.

* Product Development by William M. Schmidt Associates

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Facilities unmatched anywhere: injection, compression, extruding, and vacuum forming, reinforced plastics, painting and assembling.

Management has found a new specialist to pin onto the organization chart. This new specialist is commonly known as a product planner, though his actual title varies. He may be discovered at work in any company whose existence depends on success in a competitive market.

Product planning is design in the broadest sense of the word.

Its purpose is to ensure that new products result from careful and purposeful planning—planning that takes into account every facet of the business enterprise behind them and the market ahead of them.

Product planning is important to everyone who is concerned with product design and business management. It is of special interest to the industrial designer, who now finds that his approach has become a central concept of American business.

That is why, on the following pages, ID presents a

REPORT ON PRODUCT PLANNING IN AMERICAN BUSINESS

by DEBORAH ALLEN
AVROM FLEISHMAN
JANE FISKE MITARACHI

PP

WHY PRODUCT PLANNING? WHERE DOES IT COME FROM? WHAT IS IT FOR?

I have a particularly good friend who enjoys playing poker but rarely does. He feels as I do: he can't afford to lose. Management today can't afford to lose a major skirmish in the battle of competition—the margin of profit simply isn't there to cover a major error. Management's answer is product planning. **Harold Schaeffer, V. P. and General Manager, Appliance Div., Philco**

Today, more than ever, a business must forge ahead, because to stand still is to die. To forge ahead, a company must get a greater share of its present market or it must enter new markets. In either case it needs a product program.
M. E. Mengel, Vice President, Product Planning, Burroughs Corp.

Our primary aim in establishing product planning—the maintenance of company leadership by marketing both improved and new products — has not changed since the inception of the organization.
Barton Kreuzer, Director, Product Planning, R.C.A.

In a free enterprise economy, each manufacturer is continually vulnerable. Knowledge of what competitors are doing or expected to do is at best incomplete. To decrease vulnerability, product planning is carried forward even in situations where market position is strong, for rapid changes from strength to weakness have often been noted in the American Economy. **Professor D. Maynard Phelps**

WHAT IS ITS PLACE IN MANAGEMENT STRUCTURE?

I don't know of a business term which is as popular and at the same time as confusing as product planning. The confusion seems to arise not from a failure to understand principles but rather from disagreement as to what specific work should be incorporated into the functional job of product planning, and then where this function should be located in the overall organization. In my opinion, the exact organization location is not nearly so important as the nature of the work and, most particularly, the approach taken to the work.
Marshall Bartlett, Manager, Product Planning, Household Refrigerator Dept., G.E.

WHAT DOES IT DO TO MANAGEMENT STRUCTURE?

It is significant that our program, and every one like it, has had as one of its causes the need for better planning and more informed decisions than are possible under highly centralized organizational structures. Therefore, it is more than coincidental that decentralization and product planning appeared on the GE scene together.
Marshall, Bartlett, Manager, Product Planning, Household Refrigerator Dept., G.E.

Product planning must be integrated with your overall marketing strategy. . . . I believe that in the future the difference between a moderately successful company and a very successful company will be the difference between a company oganized on a department basis without overall marketing strategy and a company where the marketing elements are tied together as a team. **Harold Schaeffer, V. P. and General Manager, Appliance Division, Philco**

We have established the post of coordinator of product planning with the idea that all areas of our business must participate in and be responsible for the development of new products.
Robert Hood, President, Ansul Chemical Co

WHAT IS A PRODUCT PLANNER? DOES HE ACTUALLY PLAN PRODUCTS? IS HE A SALESMAN? IS HE A DESIGNER?

The essential role of the product planner is to search for, select, and evaluate new ideas, either for product improvement or for development of brand new products or services.
Barton Kreuzer, Director of Product Planning, R.C.A.

Product planning is an administrative rather than a managerial job. It has to do with pieces of paper, not with things or persons. Its real function is to study and make recommendations. Its most energetic activity is selling—selling ideas to top management.
Cal Graser, Manager, Product Planning, Portable Appliance Dept., G.E.

The product planner must be a little bit of everything. He must be able to correlate facts plus light fires. In order to do this he should be somewhat creative, but, more important, a practical critic.
Robert M. Fichter, Manager, Market Planning, Television and Radio Division, Westinghouse

Our product planning staff . . . is responsible for predigesting for management all the information that can be gotten together on a new product suggestion. In this respect, the product planner can be compared with the controller of a division or the financial officer of a corporation.
M. E. Mengel, Vice President of Product Planning, Burroughs Corporation

IS PRODUCT PLANNING FRIEND OR FOE TO CREATIVE DESIGN?

Product planning provides a smoother working relationship—a channel for communication of ideas — between the distribution elements of the business and the creative-productive elements, to arrive at a more saleable product.
Robert M. Fichter, Mgr., Market Planning, Television-Radio Division, Westinghouse

Future planning as we do it is not a science but something of a creative endeavor.
Rye Amthor, Manager, Product Planning, Home Laundry Dept., G.E.

Product planning has helped deepen the designer's approach by including him in the act of defining the problem. Each designer has to carry more responsibility—sit in on business discussions and talk out problems.
Arthur N. BecVar, Manager of Industrial Design, Major Appliance and Television Receiver Division, G.E.

The designer has to realize the planner is not trying to create a solution to the need, but is only getting all the data into the mill (the designer) before the creative process starts. So planning doesn't replace or inhibit the process but implements it. The word planning, in our book, is a process of synthesis. It has to be, because it's dealing in the future. Most planning today is based on historical data with only a meager attempt to parlay into the future. We believe good planning has to get right out there in space.
Richard S. Latham, Latham-Tyler-Jensen, Chicago

On all sides we hear that this thing called product planning is raising its ugly head, run by a specialist called a "product planner" who is not trained in design. **A consultant designer**

As the statements above show, there is not much agreement about what Product Planning is and what it does. Most of the men who have dealt with it agree that there are no sure answers now and probably never will be. Nevertheless, Product Planning is an operating concept; it has proved successful in countless companies and ways are being found of making it more successful. The Story of Product Planning, how it can be used and what it means to the people it touches, is a story that everyone in American business wants to keep up with.

THE HISTORY OF PRODUCT PLANNING BEGINS WITH ONE MAJOR FIRM

(overleaf)→

PP

HOW

Product planning had its first big trial as a result of a major upheaval in one of the country's largest manufacturing corporations that

a. pushed decision-making powers out to the furthest tips of its many branches

b. gathered sales, advertising, merchandising and related activities into one powerful team called "Marketing"

c. isolated one job in Marketing and gave it the responsibility for coordinating all product planning efforts

d. pinpointed the product as the tangible object of corporate effort

e. made "future planning" a serious part of top management's role.

On the next 7 pages, ID presents the complete story of how and why product planning came about at General Electric.

PRODUCT PLANNING STARTED AT G. E.

General Electric advertised, in 1954, that "new products created 45,000 G.E. jobs in the last nine years; one out of every five people working at G.E. owes his job to a product G.E. didn't make in 1945."

This meteoric pattern of product change is not untypical of postwar industry. But in an industry of G.E.'s size — with 135 plants in 31 states run by some 100 operating departments — new products no longer just happen by themselves. Once the firm's expansion was a simple correlary of inventions in the research laboratories and engineering departments. But today, G.E. looks ahead to change, diversification, plant investment, and the future in general, through a new set of field glasses: product planning.

"The need for product planning began with the need of any vigorous enterprise to anticipate wants of tomorrow with some clarity and confidence," remarked one of G.E.'s Managers of Product Planning recently. If this suggests the obvious answer to a simple need, it was neither. Though the act of planning was hardly new a decade ago, the way G.E. turned it into a *process* and a *job* involved radical upheavals in the very fiber of a $4,000,000,000 corporation.

It seems fairly safe to state that G.E. was the first with the most in several ways: 1) First to formalize planning as a function of Marketing (1946); 2) First to set up a department and Manager of Product Planning (1947) and write a specific job description; 3) First to put specialists on product planning in the Executive Office, to advise both managers and planners throughout the company (1951).

The act of planning a product is about as far removed today from the presidential office as Ralph J. Cordiner has been able to place it. Yet Product Planning is literally the product of his vision. He began almost a dozen years ago to introduce the concepts that led to it. Since succeeding Charles E. Wilson into the presidency in 1951, he has given full scope to his talents as a logician and planner, as a scholarly, thoughtful administrator who shows a natural instinct for questioning standard procedures and experimenting with new and better ones. He has today, as one observer has put it, the benign and unhurried air of an executive who has made time to deal with the important things — like thinking concentrated thoughts on the Future of the American Economy.

Cordiner began his G.E. career 31 years ago as an engineer turned salesman, and sold appliances before becoming head of the Bridgeport Appliance and Merchandise Department in 1938. He was by nature interested in the theory of managing business, and left the company after a few years to take over the presidency of Schick, Inc., in order to try out some new techniques he hadn't sold to G.E. Leaving Schick two years later in considerably better shape than when he'd found it, Cordiner moved on to Washington as Vice-Chairman of the War Production Board, where he gained an intimate picture of how many corporations operate. In 1943, while G.E.'s President Wilson was still on leave in Washington, Cordiner returned to the company as assistant to Acting President Gerard Swope. Thus began his chance to remold the postwar G.E. — a job he did as thoroughly as any executive in corporate history.

Cordiner's new-fangled theories about management were all the more revolutionary against their particular backdrop. Until 1940, G.E.'s history had been one of autocratic management. Founder Charles A. Coffin had run the company until 1913 with an iron hand. The famous Gerard Swope, while honoring Board Chairman Owen Young's platform that "business should serve the public interest," continued with great success the tradition of one-man rule. Yet as he built a $300,000,000 corporation over a quarter century, it began to look as if there were pitfalls to this highly centralized management: there were an increasing number of problems with which the operating management — accustomed to having decisions made at the top level — could not cope. There were crossing lines of authority between the central staff departments and the operating ones. Some corners of the business, like G.E. appliances, didn't roll at all well. The question was frequently asked: Why did Swope's big and fundamentally sound plans fail to be well executed by management?

Swope and Wilson decided to free up Ralph Cordiner to look into these problems and G.E.'s future. Relieved of daily routine, he was given three years in which to think, study, observe, and anticipate what the giant corporation would do after the war. He visited companies across the country, analyzed their management. He talked to experts, read extensively. (One of the books that captured his imagination was *Planning the Product*, by D. M. Phelps, published just after the war.) Synthesizing what he had learned and observed, he came up with a plan for postwar G.E.

Though "Decentralization" is the tag given to Cordiner's major contribution to company policy, it

went hand in hand with another concept, one that actually took root first: Marketing. While still a Vice President, he implanted the idea that grew into a G.E. credo. "A marketing philosophy," as Fred J. Borch, Vice President of Marketing Services, has put it, "is a recognition of a customer-oriented way of doing business. The customer becomes the fulcrum, the pivot point around which the business moves for the best interests of all concerned."

The Marketing concept, in turn, depended on an awareness of planning. Before the war in G.E., as in most businesses built on technology, the engineers and technicians generally planned and built the products, and the salesman put them over on the market as best he could. Since it behooved the salesman to impress on the engineers what sold, he became the main line of communication between producer and consumer. For a long time, selling was enough: with all the improvements electricity could bring, no one worried much about digging up ideas for the future. Technological conditions permitted an emphasis on *how* to make products, not *what* to make.

During this time, G.E. produced many firsts (e.g., the hermetically sealed refrigerator compressor, the rapid-start fluorescent bulb) but some failures crept in too. Competitive growth began to indicate that electricity was not enough to make a product attractive; it had to do things in a certain way at a given price.

Sensing the changing business climate, and sensitized to the customer's outlook by his selling experience, Cordiner concluded that the company's relation to the market had to be systemmatized on a long-range basis. It was not enough for salesmen or engineers to find out, or prejudge, what the customer might buy. That judgment needed to be based on the broadest thinking, and it needed to be organized so that Engineering, Research, Finance and Manufacturing could participate in this broad corporate goal. This was Marketing; it was no longer just selling goods, but an integrated function that concerned itself with the whole cycle of producing goods to meet the market. And since this was an interdepartmental activity, Marketing needed someone to take the responsibility for bringing that integration about.

The postwar puzzle

The need for a systematic way of dealing with the future was dramatically clear in G.E.'s own position. Its facilities had grown enormously during the war. What would support it? The immediate problem, clearly, was going to be over-demand, but this posed several critical questions: 1) How would G.E. meet the backlog of demand for consumer goods? 2) How long would the extraordinary demand last? 3) When things leveled off, what would it do with its tremendous resources from wartime expansion?

One conclusion Cordiner reached was that diversity, not merely size, was the complicating element in future planning, and this was a result of centralized control. G.E. was making hundreds of dissimilar products, from ranges to industrial components; many operations were still controlled by the central Engineering, Manufacturing and Finance staffs, which could not be efficient because of the sheer diversity of demands made on them. It took a vastly different set of skills to regulate the policies and operation of chemical plants and appliance plants. And, with control of many operating policies in the hands of the central staff and the president, real responsibility for running the divisions was not in the hands of the vice presidents who were expected to manage them.

In 1946, when Cordiner was put in charge of all G.E. affiliates — operating as decentralized companies under their own managements — he saw a chance to perform a laboratory experiment with his theories about decentralization. He suggested that each of the six affiliates — Hotpoint, Monowatt, Trumbull, X-Ray, Telechron, Carboloy—set up a new "Marketing Section" that would include the job of planning what products could and should be produced.

Hotpoint, for one, proceeded with an unusually clear idea of how to make an operating reality out of this directive. James Nance, just appointed President, named L. C. Truesdell as Vice President of Marketing,

"MARKETING"

In 1952, your Company's operating managers were presented an advanced concept of marketing, formulated by the Marketing Services Division. This, in simple terms, would introduce the marketing man at the beginning rather than end of the production cycle and would integrate marketing into each phase of the business. Thus, marketing would establish for the engineer, the designer, and the manufacturing man what the customer wants in a given product, what price he will be willing to pay, where and when he will want it. Marketing would have authority in product planning, production scheduling and inventory control as well as the sales and distribution and servicing of the product. This concept, it is believed, will fix responsibility, while making possible greater flexibility and closer teamwork in the marketing of the Company's products."

—From the General Electric Annual Report, 1952

THE PHILOSOPHY OF DECENTRALIZATION:

1. Places authority to make decisions at points as near as possible to where actions take place.

2. Is likely to get best overall results by getting greatest and most directly applicable knowledge and understanding on the greatest number of decisions.

3. Will work if real authority is delegated, and not if details have to be reported or checked first.

4. Requires confidence that associates will have capacity to make sound decisions in the majority of cases.

5. Requires realization that the natural aggregate of many individually sound decisions will be better for the business than centrally controlled decisions.

6. Requires understanding that the main role for "staff" is the rendering of assistance and advice to "line" operators through a relatively few experienced people, to help them make correct decisions.

7. Rests on need to have general business objectives, organizational structure, relationships, policies and controls known, understood, and followed; but realizing that definition of policies does not necessarily mean uniformity of methods of executing such policies.

8. Can be achieved only when higher executives realize that authority genuinely delegated to lower echelons cannot, in fact, also be retained by them.

9. Will work only if responsibility commensurate with decision-making authority is truly accepted and exercised at all levels.

10. Requires personnel policies based on measured performance, enforced standards and removal for incapacity or poor performance—Ralph Cordiner, 1952

and they selected a young Assistant Chief Engineer, William F. Ogden, to head up what was to be, as far as anyone knows, the first corporate Product Planning department. Energetic and action-minded, Ogden now admits that he was suspicious of the word "planning," and its abstract overtones. He proceeded to organize the department, but kept the title of "Manager of Products" for over a year, just to assure himself he was *doing* something. He found himself doing a considerable amount before his planning career was over.

Ogden's first task was to write a "position guide" to describe his own job. There had been, of course, liaison between sales and engineering all along, generally handled by "commercial engineers" who did as much formal planning as was required at the time. He and the Hotpoint marketing group broadened the concept considerably, including such tasks as "forecasting" and "production scheduling" that today are done by Marketing Administration. But most important, by bringing this function out into the light and defining it, they helped to build it into an approach to managing an entire business — a way of evaluating a total business position.

As each affiliate worked out its own way of integrating the planning job under Cordiner's supervision, lines of communication remained informal. Then in 1949, the New York office issued a Marketing Guide for all the affiliates. Describing all the functions of Marketing, it referred frequently to something called "Product Planning." The next year a revised Marketing Guide went to *all* divisions of G.E. — the first companywide recognition of Product Planning as a Marketing activity. The actual work of planning had not yet been totally defined, but top management made it clear that planning and marketing were to become the dominant force of the company.

At this time, what product planning there was came from committees where men from Sales, Manufacturing, Finance and Engineering talked out a solution with the General Manager as referee. There was little to encourage them to look beyond the next model change, or to consider the company as a whole. But in 1951, when Cordiner got his chance to try out his theories on the whole company, he swept out the committees, and product planning came into its own.

Splitting up the firm

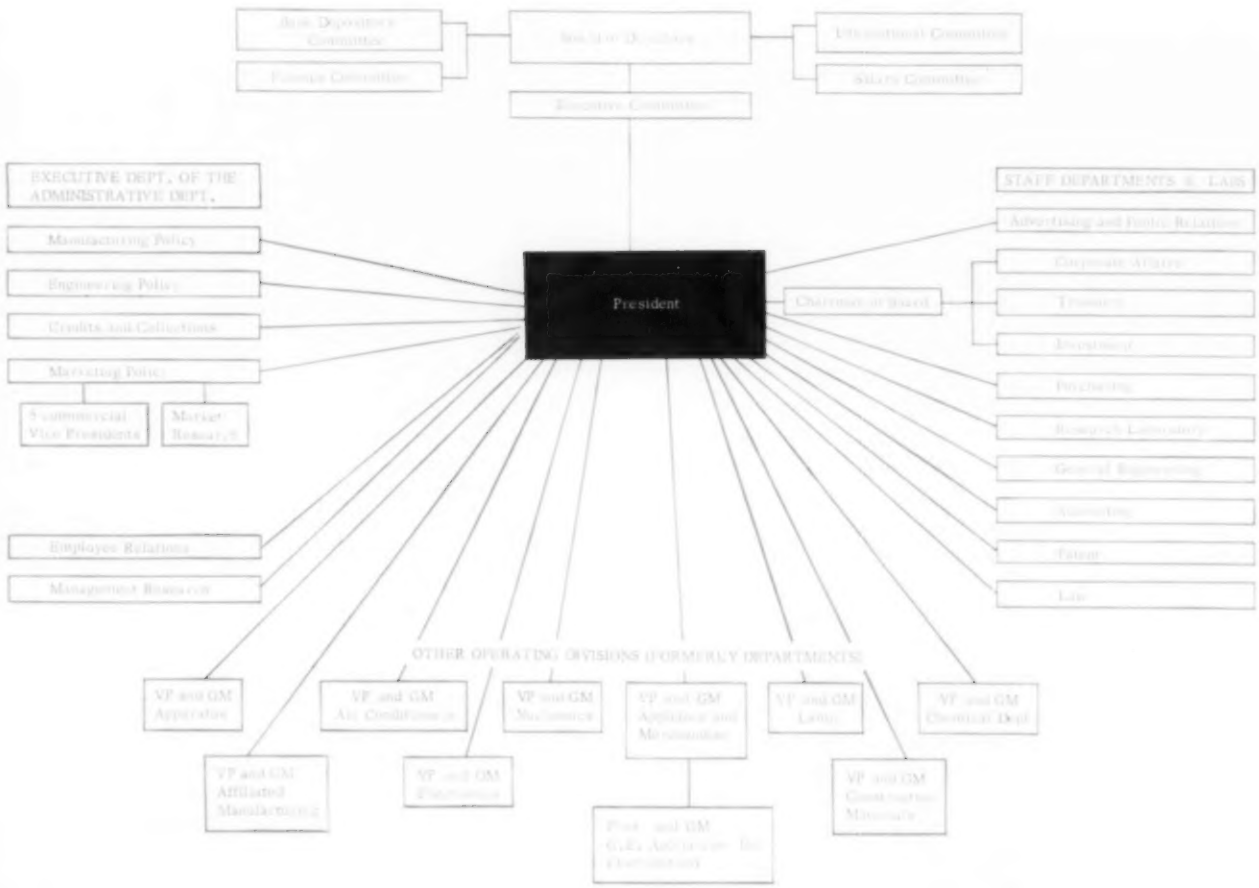
When Cordiner took over, G.E. had 16 central staff departments, 14 operating divisions, and one Chief Executive to whom they all reported. After three years under Cordiner, it had added six Executive Vice Presidents with presidential stature, replaced its staffs with nine service components, and had split up the rest of the company into 21 operating Divisions and 100 operating Departments. It had placed Marketing Sections in all Departments, with responsibility for planning the product line.

In his desire to cut up G.E. into chunks "small enough for one man to get his arms around," Cordiner had two management objectives: 1) To set up operating units of such a manageable scope that the Executive Office could rely on flexible, fast decision-making at the point of operation, which meant lowering the authority level as far as possible; 2) To free executive minds from day-to-day operating decisions in order to concentrate on high-level advance planning. "A manager," the president wrote, "is essentially a long-range thinker, a planner, an organizer, a teacher. The temptation to continue work in his particular technical field of experience . . . must be stubbornly resisted. He must keep for his own man-hours only those functions involved with the determination of objectives, the development of clear and creative plans."

In setting about to achieve these objectives, Cordiner recognized several premises basic to making decentralization effective: 1) It is necessary to formalize planning at every level. 2) It is possible to create a hierarchy of decision-making — and some decisions are, in fact, better made at lower levels where the results and activity take place. 3) Decision-makers need all available facts in order to act, so it is impor-

PP

In old G.E. of 1950, president controlled all departments as well as staffs making company-wide policy.



tant to build fact-gathering into the system as an objective method; 4) Decision-makers need the advice of people with the broadest background as well as with specialized knowledge.

The president summed up the different levels of authority in this way:

1) "Executive management — comprising the president and any senior officers who assist him to determine the company's overall objectives, leadership, planning, organization and performance appraisal." The Executive Vice Presidents, for example, each in charge of a Group of Divisions, devote most of their time setting long-range goals for their Group and the company as a whole.

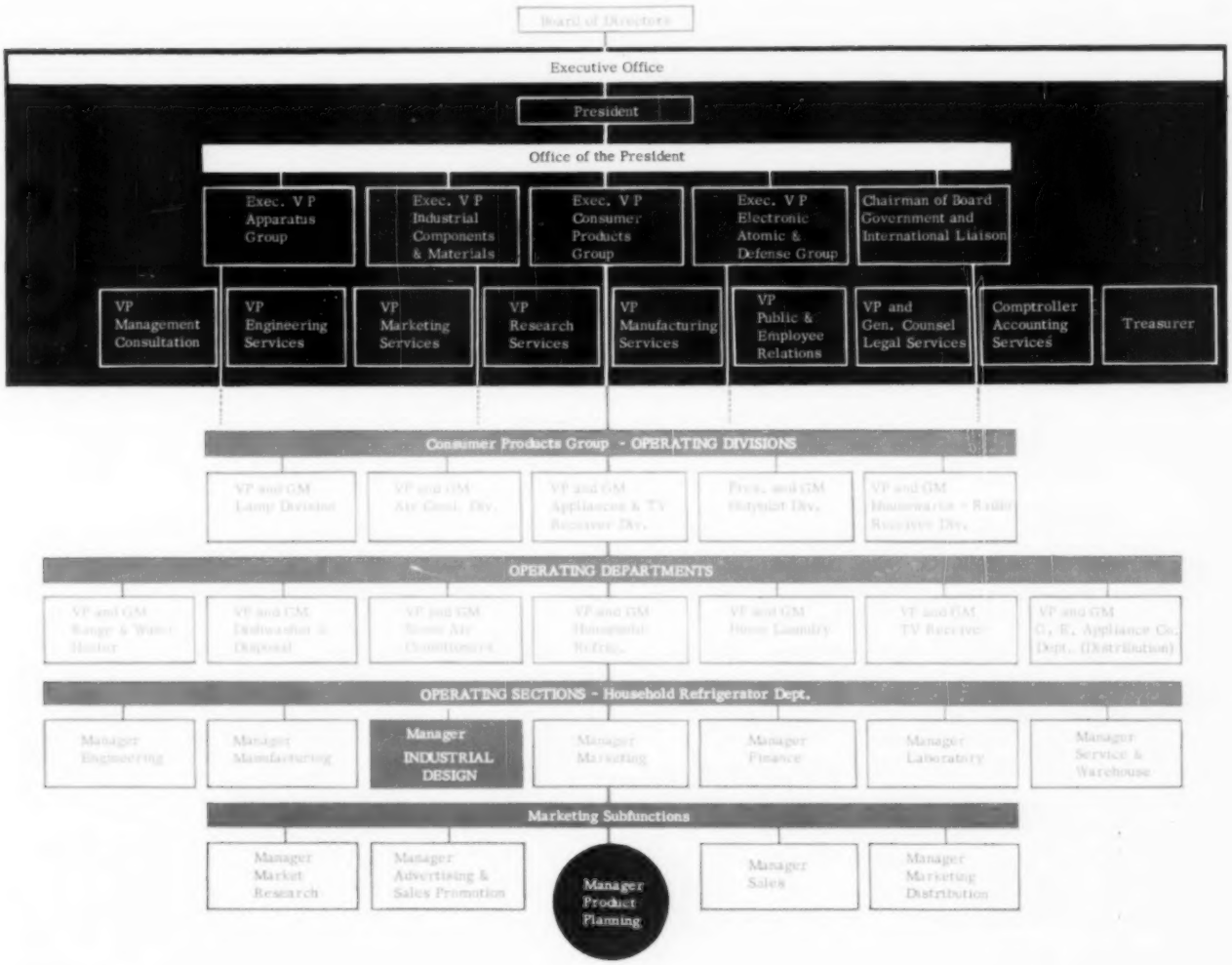
2) "Operating Management — made up of General Managers responsible and accountable for the successful conduct of their respective decentralized business within the framework of the overall policies of the company. They carry out overall objectives and plans, and formulate their own goals and activities for their respective components."

Under the Division Manager, the Managers of Finance, Engineering, Manufacturing and Marketing each have their respective area of authority, while the Product Planning Manager in the last section is charged with getting agreement on day-to-day and long-term recommendations about the product line. The responsibility is there for a very good reason: at this level planners may be best equipped to get the best answers about the product on which the company's health depends.

Meaning of services

The third category which Cordiner spelled out was entirely new to G.E. and held some important implica-

Decentralized G.E. now is family of independent businesses with authority at operating levels.



tions for planning: 3) "Services management — made up of people skilled in specialist functions, able to render expert technical service on a company-wide basis. These men assist in the formulation of overall objectives, policies and plans, and give specialized recommendations on how they are to be carried out."

The Services are, in some ways, the successors to the old central staffs, but with a unique orientation. Each of the nine Service areas (see chart) has its own Vice President with a given area of responsibility — with absolutely no authority over the operating departments. Purely advisory, they can only look into departments and appraise. There are two main reasons for this: 1) They are a body of the best specialists and thinkers in their fields, freed of routine duties to help the president plan ahead. They must keep totally informed of all current knowledge and practice in their fields. 2) As the only executive-level groups that are available to all the operating departments, they advise the Marketing, Manufacturing, Finance and other operating executives whom they do not direct. They also serve as clearance house for practices, techniques and research within the company. "Services," Mr. Cordiner has been quoted as saying, "might better have been entitled 'Futures,' to point up their importance as a resource pool for the whole company, as an insurance policy against trends and pressures that might threaten the company's future."

One of the specialists in the Marketing Services today is Dave Day, known as "Consultant in Product Planning." He arrived there after some front-line experience in product planning in the Apparatus Division, but how he got these jobs goes back to the days just after the first Product Planning Department had

been set up at Hotpoint.

Bill Ogden left his job as Manager of Product Planning at Hotpoint and came to New York in 1951, as the new Marketing Services were being organized by John Busey. The first task of Marketing Services was to set up—without any reference to jobs already held—a model for a decentralized marketing organization in any part of the company. A simple, comprehensible pattern that could be fitted to a variety of business needs, their model divided the total marketing job into seven functions, with product planning the newest of them all. Full responsibility for the latter was included in the Marketing Guide, and a Manager of Product Planning was recommended. Thus the function officially moved out of informal committees and became a specialized job for an individual.

Definitions were a good beginning, but Busey knew that it would take support and help and salesmanship to get the idea launched in the field. He named Ogden the travelling salesman of Marketing Services, with the job of spreading the word about product planning to all corners of G.E. In the next four years, Ogden travelled thousands of miles and talked to nearly 500 executives about the theory and techniques of product planning. Starting with Division General Managers, he tried to work his way to Department Managers, and then to the Marketing men who would ultimately supervise the new function. He talked, as he puts it, to anyone who would listen. Many listened, and a number enlisted his help in setting up a planning section. [Dave Day was one of the planners hired at the time.] Though the idea had broad appeal, it took root more slowly in some Departments than in others. Where the technical content of the product was extremely high — as in producer goods — or where production was still being allocated, managers often tended to postpone the reorganization that was called for by the new concept.

Where product planning was adopted, the operating principles came from Marketing Services, but the manner of carrying it out was still up to the General Manager. Ogden's purpose was never to enforce a pattern but to teach a basic approach. Work "programming" is critical to Ogden's approach. He recalls that his original source, Phelps' *Planning the Product*, set forth the problem well, "but in emphasizing the need for market information it missed the crux of the problem — *organizational plan* to get ideas translated into things." In other words, a product planning system.

In 1955, the *Ten Elements of Product Planning* issued by Marketing Services helped to describe the kind of work a G.E. product planner might expect to do. Significantly, the "elements" were phrased less as things to do than as subjects of thought — suggesting to what degree the planner is responsible for studying, or getting others to study, the larger problems of the future of the business. "Product scope," for instance, is the first of the ten elements: here he is specifically charged to give thought to the nature of the business as it is already defined — and to whether any new products might fall within it.

Where design fits in

It is in keeping with G.E. gospel that the G.E. Product Planning departments have turned out with varied personalities — each a reflection of its business, its General Manager, and its marketing and planning leaders. Thus there is no such thing as a typical example, although the Bridgeport Small Appliance Division and the Louisville Major Appliance Division demonstrate with some degree of generality how design and product planning have been linked in the organization picture.

Before decentralization, the section then known as "Appearance Design" was part of the Engineering staff of the Major Appliance and Merchandise Division in Bridgeport. When Major Appliance built its own home in Louisville, Small Appliances was left with four operating departments, and for a while they were all served by traditional central staffs. One of these company-wide groups, Marketing, embraced both Product Planning and Industrial Design. Since the Manager of Industrial Design reported to the Manager of Product Planning, and his design facilities were available to all departments, integration of the product line was fairly easy.

In 1953, in the final phase of reorganization, all of the staffs were dropped, and their work split up in the autonomous Departments. Bridgeport management decided not to include a separate design group for each, so it nominally attached the complete design section under R. H. Koepf to the Fan and Blanket Department, yet left it free to serve the other three. This, in essence, is how it works today. Industrial Design and Product Planning are parallel subfunctions, under the Manager of Marketing. The product planner in each of the four departments is responsible for proposing and handling a yearly budget for industrial design service. As the one man holding the purse strings, he is closest to the decisions about exactly how the allotted design time shall be spent by Engineering, Marketing or Planning. Although the design staff is presumably centralized for budgetary and administrative reasons, it works out that the design group has much of the autonomy of a consulting firm. It may or may not be hired, which gives it a certain independence; and it follows that it tends to contribute rather than just please its client.

In Louisville, the design-planning relationship evolved in a similar way — but the differences are significant. When Appearance Design moved out of En-

gineering into one operating department, it was given section status: a new Manager of Industrial Design, on a par with Managers of Marketing, Finance, Manufacturing and Engineering, was added. In this spot, Arthur N. BecVar operates even more independently, partially because some of his job requirements make him directly accountable to the Department and Division General Managers. How and why the Louisville system works will be taken up on pages 70-75.

Decentralization and planning

Ralph Cordiner's two management objectives — Marketing orientation for a sound, consumer-wise company, decentralization for a more efficient, forward-looking operation — showed very little apparent connection when they came on the scene. Yet the growth of G.E. shows, in retrospect, how interdependent the ideas were. Without the Marketing philosophy, with its insistence on a larger awareness of the consumer's viewpoint, there would have been less point to the vast reshuffling required by decentralization to achieve better planning and more reliable decisions. Without the shifts of authority and emphasis on future planning that were inherent in decentralization, Marketing might have remained a powerless function. Decentralization has done more than shift responsibilities. It has done more than isolate experienced men to do little besides think about its future welfare. It has given to all ranks of management a tremendous awareness of the problems of a modern organization. The Big Change has been studied and understood — and by and large endorsed — by men who are being taught that it is only the beginning of change, by men who are being taught to expect and bring about change as part of their jobs. The philosophy of change is taught in intensive courses in G.E.'s Crotonville management school, as well as in after-hours courses set up by the Divisions. It is taught in a special form, under the aegis of Marketing Services, to product planners. Last year, Marketing Services felt it was time for review and correlation for the 300 men working in G.E. planning, and launched a series of seminars that would give them a chance to exchange information on how they do their jobs: to discuss techniques, clarify goals, and generally develop the ability to make forward-looking decisions in any situation.

This kind of program summarizes G.E.'s view of the current art of product planning: it is preparation for a permanent period of transition; it is a method of remaining stable in a continuum of change. No one — least of all the planners — knows whether the techniques of today will solve the problems of tomorrow. No one — least of all the planners — knows what G.E. will be manufacturing in that Future American Economy that their president is thinking about.

10 WORK ELEMENTS OF PRODUCT PLANNING

As defined by the G.E. Marketing Guide, each work element "constitutes a distinct area of Product Planning responsibility, and all of them together make up the Product Planning function." This is how each was interpreted by Portable Appliance Department of G.E., Bridgeport, in creating a new product:

1. Product Scope Recommendations: What functions should the products of this Department perform? Are they in the best interest of the Company as a whole?

In 1953, management called a product review meeting in the Portable Appliance Department to explore new product concepts. The function of toasting and warming bread products in a portable plug-in device was deemed within Department's scope.

2. Analysis of Consumer Needs and Habits: When the habits, prejudices, desires and needs of the consumer are analyzed, what requirements must product meet?

Market research study of the handling of bread products in the home indicated desire for pre-buttered toast, grilled sandwiches, warm rolls without heating up a big oven.

3. Product Specifications: What features are required to meet the marketing need?

Since vertical slots were acceptable and worth retaining, horizontal toasting, grilling and warming needed to be accomplished with a minimum of duplication of timing and heating mechanisms. An open compartment was indicated.

4. Appearance Design: What appearance in the product and package will achieve maximum sales volume?

With this major change in construction and operation, Industrial Design felt a new appearance was needed — but not so radical as to be unrecognizable as a toaster.

5. Product Appraisal: How do competitive products compare with G.E. products in price, features, appearance, performance, quality and serviceability?

With little differentiation among other brands of toasters, the drawer was considered an outstanding, saleable feature.

6. Product Timing: What will be the most advantageous time to introduce a new or discontinue an old product?

Because of radical changes in the mechanism, nearly four years were required from inception to market introduction, complicating designers' task of creating for a future market.

7. Price Formulation: What is the value to the consumer? What is the optimum price to achieve maximum returns?

PP and market research estimated oven feature to be $10 value above $19.95 for standard G.E. toaster: thus $29.95 maximum.

8. Product Information: What are the merchandising facts needed to sell distributor and customer?

Product Planner formulated data for instruction books, sales catalogs, advertising copy, as well as advance sales data.

9. Control of the Line: What products should be continued, replaced or eliminated to maintain an optimum balance in the product line?

Product planning recommended continuing current standard toaster as high volume price leader to facilitate selling-up new "Toast-R-Oven."

10. Idea Processing: Analyzing ideas from all sources, which ideas meet marketing needs and are worthy of investigation? Are all creative sources being tapped?

Most products, like Toast-R-Oven, are not the work of one person or function. Analyzing needs and pursuing new ideas is a continuing group process.

PP

WHO

Burroughs: Vice President plans a product line to cover an expanding market

RCA: corporate Director channels technological research into product development

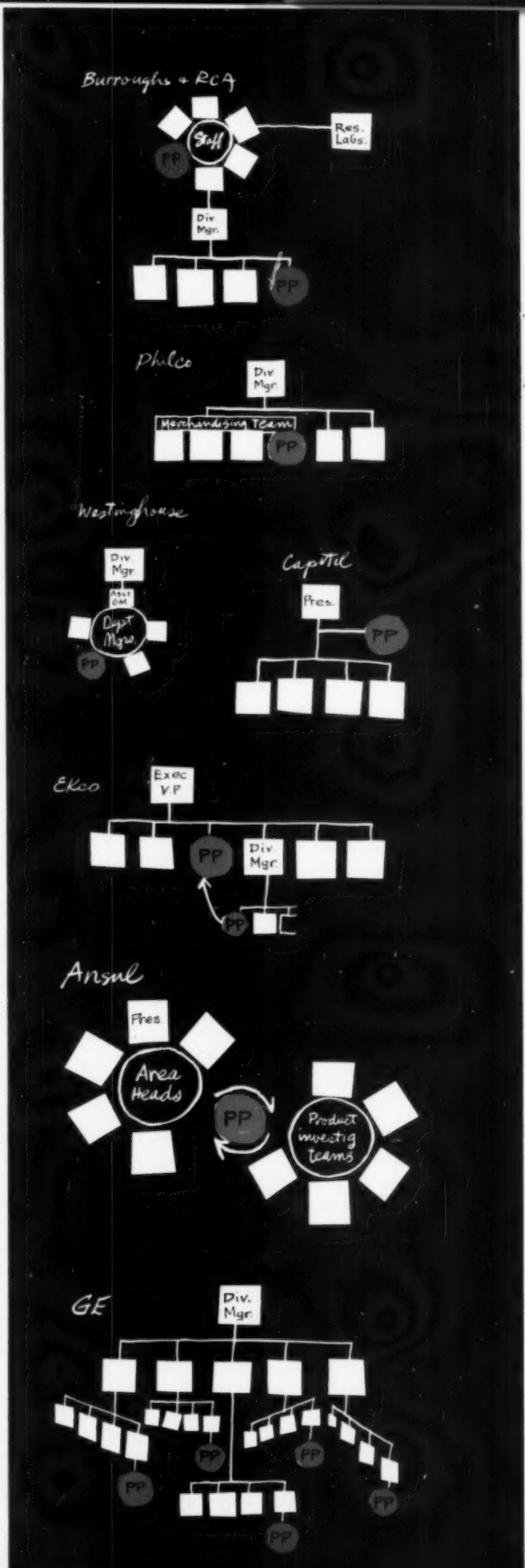
Westinghouse, Philco: division planning managers plot changing consumer trends for competitive race

Capitol Products: President's right-hand man seeks out and creates unique products

Ekco: Vice President leads design and merchandising of diverse product line

Ansul: from the President's Coordinator to the operating specialists, everyone participates in planning

How the planner works in any company is a function of its special position in its market and the diversity of its production, as described on the next 20 pages



does the planning in various industries?

Organized product planning is a war-baby—really a post-war baby—brought about by the growth of production and research facilities during the war and the opening up of a goods-starved consumer market immediately after it. How to increase production, revise design, and expand the marketing of traditional product lines were problems enough to keep many consumer goods industries busy, but almost all companies recognized that they could survive only by diversifying their line or capturing a wider slice of the market, or both. What to do with the greener fields on the other side of its fence, how to apply the war-bred technology to peacetime goods, and how to meet its own requirements for efficient growth were questions that troubled many a company that might have been happy to stay specialized and small. The importance industry attached to product planning as a way through these problems is indicated by a partial list of firms that adopted it: American Telephone and Telegraph, Whirlpool-Seeger, General Motors, Reynolds Metals, Eastman Kodak, American Cyanamid, Canadian Industries, Sylvania, A. O. Smith, Ford, Hoover, Parker Pen, The Washburn Co., Underwood. Product planning has even been delegated to a company itself: the Ramo-Wooldridge Corporation is the Air Research and Development Command's "product" planner for the Intercontinental Ballistics Missile, organizing 220 subcontractors in the development program. Seven companies whose managements are charted at left show some typical methods of adapting product planning to meet a variety of business needs.

How to win more consumers

Unstable demand—changes in purchasing power, population and public taste—an improvement-centered market that made known its willingness to spend, planned obsolescence—these were the usual reasons behind the turn to product planning in companies with a well-established line of consumer goods. Philco and Westinghouse responded, like General Electric, by shifting their emphasis from production and engineering to marketing and product saleability. They developed, as their primary weapon in the competitive race, a system of reading the consumer's mind and creating products to satisfy his changing demands. Philco uses a merchandising team which links the Product Planner with Advertising, Sales, and Promotion as the major force in beating competition, while Westinghouse recently turned to a Market Planning Department as a way of getting design, market research and sales together to determine the market's wants and create products to satisfy them.

What to do with technical research miracles?

Technological research during and after the war opened up tremendous markets based on new products that perform new services. Burroughs, as a case in point, was led to expand by the expansion of their business machines market, under the influence of new electronic data processing inventions, and by their desire to capture a larger share of that market from their competitors. RCA, on the other hand, has a long tradition of technological change and enormous research facilities for it, and it continued to open up new markets with new inventions. To turn technology into business growth, both companies have placed product planners at top levels in their managements. Burroughs made a place at the top management table for a Vice President of Product Planning to help direct its changing product line to cover the data-processing market, while RCA appointed a Director of Product Planning to act as a clearing-house of product ideas and inventions. Both companies use product planners at the divisional level to coordinate the development of saleable products out of pure research ideas.

Where do we go from here?

The need to use productive capacity more efficiently, to enter as many profitable markets as possible, to better use waste, by-products and materials—and in small companies the desire to decrease the risk of any one product's failure—these were major reasons for diversification in many companies that found themselves stable but static after the war. Ansul Chemical Co. was typical in its search for new products whose development and manufacture would use its resources to the fullest; it was unusual in coming up with a thoughtful program of product planning which brought everyone in the company from the President to the plant technicians into the process of development.

Many firms with long histories of diversification and acquisition reached the stage where they covered highly diverse markets. Ecko Products last year appointed a Vice President of Product Planning to act as a super merchandising chief on the executive level, placed high up to advise the Executive Vice President on the range and change of a wide line of products whose design is a major sales factor. He also operates functionally to coordinate the scattered activities of product planners located at Ecko's many plants, and to direct the design department under him toward embodying market needs in design.

Another type of growth company makes news almost every day by a spectacular rise from its first home in a rented garage to a sales record in eight figures. In some of these phenoms, it is Product Planning that is responsible. Capitol Products has been directed from the start by an energetic President and a creative Vice President of Product Planning—an industrial designer. They have captured one-third of the nation's aluminum door market, rank first with this infant line of products, but the President aims to make the company an all-around light metals fabricator, and the Product Planner is active in discovering, inventing and initiating products for the increasing plant facilities to manufacture.

Product planning as it is practiced in American industry today shapes up as a bird of many colors, but it is no longer a rare bird: it is an idea that almost everyone seems to be turning to, interpreting in the light of his own business, using in many ways to do the increasingly complex job of creating better products.

PP

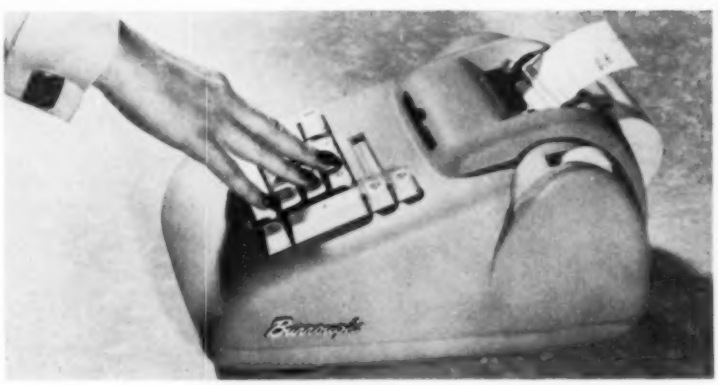
NEW TECHNOLOGY FORCED A CHANGE IN

Burroughs Corporation came out of the war essentially the same traditional adding machine manufacturer it had been since the last century, with wide experience in custom-building office machines for special purposes. But when a new management under President John S. Coleman took over in 1946, it found the company was really in a new kind of market, pressed by a new kind of competition. Electronic research, stimulated by war needs, had opened up a new industry for peacetime business–electronic computers–and invention had become the mother of necessity, creating an expanding market for machines to service the growing volume of American and world business.

Burroughs' new aim in life is to expand in automatic data-processing, which it considers a natural complement to its manual data machines. But in order to join the two types in one complete line it first had to define accurately the scope of its market and the kinds of service which its machines had to provide. This concept of *scope* has helped many companies expand their product line systematically and profitably; a glance at the changes in Burroughs' product line shows how imaginatively it has attacked the definition of its business and applied electronics to orthodox accounting machines.

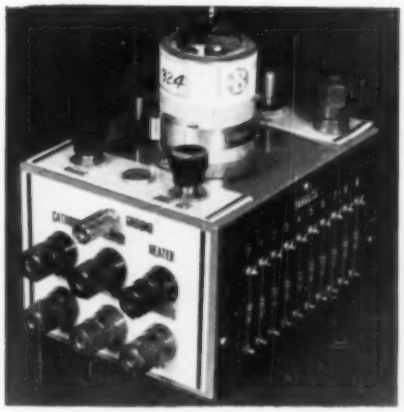
How Burroughs changed itself and its product to use changing technology can be gleaned from the events of the postwar decade: 1946: reduction of its line of 582 special purpose machines to 95 general purpose models that could be produced in volume; 1949: entry into electronic and electro-mechanical research which led to many new products; 1954-1956: acquisition of the ElectroData Corporation (making Burroughs the third largest computer manufacturer in the country), acquisition of the Control Instrument Company and its punched card data experience, and acquisition of the Todd Company with its checks and forms printing machines and knowledge. Burroughs' sales rose from $46 million in 1946 to $272 million in 1956 on the strength of its product-minded expansion. Its Vice President of Product Planning Milton E. Mengel, who came up through the sales ranks, now stands at the center of Burroughs' growth.

A product planner who is, in effect, a company planner, Mengel is both a top management decision-maker and a man always on the move throughout the company's divisions and research labs. He makes policy decisions on product development in executive session with the President, Executive Vice President, Vice Presidents of Marketing, Finance, Research and Engineering, and Manufacturing, and the Vice Presidential Secretary. They use Mengel's research of the nation's businesses, and other analyses, carried on inside and outside the company, to discover the facts on current employment, record-keeping procedures and volume of business. Mengel is thus able to come up with a precise formula for the needs of the market–without having to rely heavily on the interpretations of company salesmen–in a field where consumer taste and planned obsolescence are less important than technical and financial concerns. These facts become the basis of the company's "master plan" for its corporate growth and product development–a precise outline of the market's needs and the kind of products to service them.

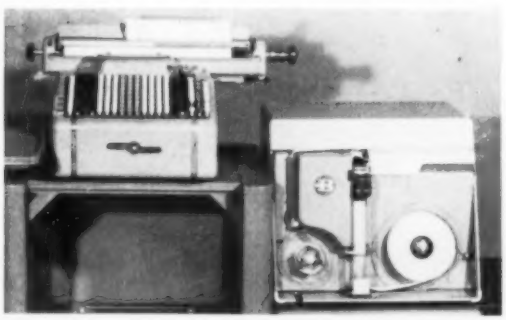


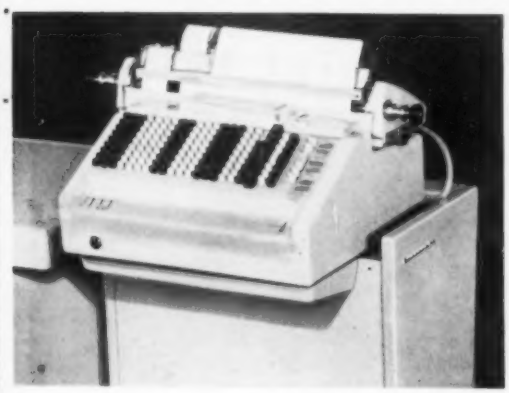
Manual machine line was reduced and redesigned: Ten Key mechanical calculator was easily added to production as selling option for full keyboard calculator.

BURROUGHS' SCOPE: PRODUCT PLANNING LED TO A NEW PRODUCT LINE



Sensimatic (shown with punched tape attachment) was first in line not derived from adding machine, designed specifically for accounting; highly flexible, it obsoleted many custom-built special-purpose models.





Sensitronic bank bookkeeper began the fusion of electronics with electro-mechanical techniques in product line: electronics added to Sensimatic keyboard system allows automatic pickup of old balances, automatic alignment of forms.

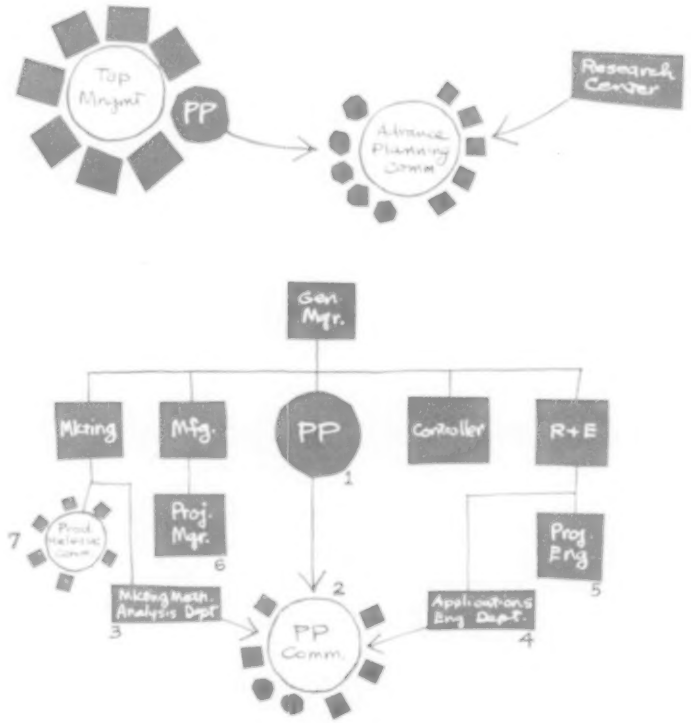
E 101 desk-size computer was Burroughs' first electronic machine, but incorporated Sensimatic input-output mechanism; developed at Research Center, Detroit Manufacturing Dept. set up special organization to engineer it for production.

Datatron is medium-price electronic data processing system, manufactured and marketed by ElectroData Division; it includes Cardatron punched-card data hookup and Datafile auxiliary memory.

TECHNICAL RESEARCH: BURROUGHS SCREENS IDEAS SYSTEMATICALLY

Dependent on advanced technology for its very competitive existence and expansion in its market, Burroughs doesn't wait for ideas to come up the management ladder from its salesmen and operating engineers Vice President Mengel explores market needs with Vice President of Research and Engineering Irven Travis. At Burroughs' Research Center at Paoli, Pa., market-minded product planners meet with technical researchers in advanced planning sessions (chart, right). They do the preliminary work of formulating a product from a scientific idea, and the new product concept can then be evaluated with a keen eye to profitability from the total company's standpoint, eliminating ideas that find no place in the master plan.

Once the ideas are in, it is important that they be caught up in a systematic process of screening and development so they will not get lost. Both major product proposals from top management, and minor modifications of existing products that come from the divisions dealing with them from day to day (by far the majority of product ideas), are handed to the Managers of Product Planning in the divisions for coordination. They evaluate new ideas with the help of specialists from Manufacturing, Marketing, Research and Engineering and the Controller's Office. In some divisions (a composite chart is shown right), the Product Planner (1) convenes a special committee (2) from the Marketing Methods Analysis Department (3) and the Applications Engineering Department (4) to draw up more specific proposals for screening by division management.



Like many companies, Burroughs emphasizes the financial logic of the system: it separates the sheep from the goats at the earliest possible moment and puts its development money only on the best bets. If the project is an improvement on an existing machine, little confirmation beyond the division's General Manager is needed to go ahead with the final execution plans, but if the project is a major one involving a large appropriation of funds for development, the Product Planning Manager reports directly to top planner Mengel, and through him to the executive staff. Naturally this type of two-level organization requires good relations and strong liaison, and the vice presidential authority of product planning goes a long way toward coordination of corporate and divisional activities.

Besides the Product Planners' continual activity in organizing a never-ending screening process, they have a responsibility—a diminishing one—for follow-through in the production and marketing cycle. Here they act with a Product Engineer (5) under Research and Engineering, a Project Manager (6) appointed by Manufacturing, and a Product Release Committee (7) composed of the Advertising, Sales, Sales Promotion, Sales Training, Service and Service Training managers in Marketing. These are appointed or convened for a specific product and are responsible for setting up its engineering specifications, production requirements and distribution techniques respectively. Burroughs' product planning coordinates the project from the birth of an idea—stimulating technological research for profitable product proposals—through the complete cycle of evaluation, screening, specification, production, and marketing.

RCA plans at divisional and corporate levels

Few industries have developed and expanded as rapidly in so many different directions as the electronics industry. In that industry, few firms have been as successful and as consistent over the years in converting pure scientific research into saleable products and equipment as the Radio Corporation of America. "Eighty per cent of the products we are now selling didn't exist ten years ago," said "the general" recently, and under David Sarnoff's direction this has been the company's rule rather than a post-war happenstance. In RCA's thinking the legitimate scope of its operations is the entire electromagnetic spectrum as seen in the laboratory—from sight-waves to sound-waves and all the varieties between.

With a backlog of products whose development had been restricted during the all-out war effort, and military inventions waiting to be refined for consumer use, RCA foresaw the need for a system of product development to turn scientific ideas into commercially feasible and saleable products.

RCA's system is to have development coordinators in the divisions, like Manager of Product Planning A. R. Baggs in Radio-Victrola and Merchandise Manager Alan Mills in the TV Division, who coordinate the competitive changes in

RCA CHANNELS INVENTIONS THROUGH A MANY-LEVELED COMPANY

existing product lines. These men report directly to the division manager, work closely with Advertising, Sales and Engineering, direct the Styling Department (under Bernard Grae in Radio-Television, headed by Henry Rundle in TV) and a merchandising manager (called a Product Planning Administrator). They use new features that come out of the division's engineering staff, but until recently no one had the full-time job of bringing new ideas from RCA's seven research labs to the attention of the divisions. This was generally done by contact between corporate management and the division general manager.

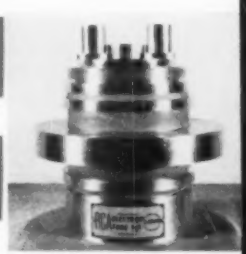
In 1954, Chairman of the Board Sarnoff, President Frank M. Folsom and Senior Executive Vice-President Elmer W. Engstrom brought in Barton Kreuzer, former sound engineer and Industrial Marketing Manager, to become the first corporate Director of Product Planning, surveying the company's planning activities and reporting direct to the Senior Executive VP. Kreuzer ranges at large in the no man's land of RCA's complex corporate structure, using market research done under Vice President of Economic Planning E. Dorsey Foster, and scientific research done under Vice President of Research and Engineering Douglas H. Ewing, to come up with new ideas on the market's demands and new electrical methods of supplying them. Five technical analysts under him are assigned to discover, stimulate, coordinate, test and evaluate new ideas in the five broad realms of the company's manufacturing. They are attuned to the recommendations and views of foreign observers, sales managers, dealers and distributors, and technical consultants throughout the complex RCA organization.

Product Planning stops short of developing ideas beyond preliminary market research or scientific testing. Due to RCA's strictly defined organization, it can pass them on to the appropriate division for their own analysis of the idea in the light of their manufacturing. It speaks, of course, with top management's backing, but the job is something of a diplomat's in motivating the divisions to accept ideas for development.

Product planning at RCA is a subtle art of correlating the activities of a vast organization, separating the glitter from the gold, and channeling the best ideas to the divisions best equipped to turn them into saleable products.

Corporate decision: Entry into tape recorder business

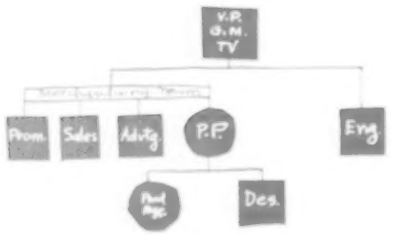
New department to manufacture new product: "Bizmac" data system at Army installation



Electronic research: High power radio tube (developed by Tube Div.)

Divisions widen their lines: Hi-fi console for luxury market

PRODUCT PLANNERS LEAD DESIGN DIFFERENTLY IN FOUR FIRMS



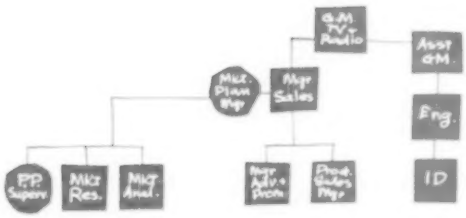
Philco: design links sales and engineering

When "Philco" connoted just radios to the public, there was little pressure on the company to develop new management methods, and top management could plan the entire product line unaided. It was the competitive pressure toward planned obsolescence and Philco's postwar development into a multi-product consumer appliance producer that brought the Product Planner into the picture. With the company's sales emphasis shifting from engineering and production to design and merchandising, Philco needed to give greater prominence to marketing functions–at the same time allowing engineering and design to develop new products without the inhibition of being directed by sales managers.

How the problem was resolved in the TV division is shown in the chart above: Product Planner Armin Allen is placed to perform two kinds of functions: he joins with the Sales, Advertising and Promotion managers to form a merchandising team that meets frequently with the advertising agency (B.B.D. & O.) to plan the product in terms of demand and competition in the market. He directs Product Design in its work with Engineering to guide products toward strong competitive objectives. So important is this dual role, in Philco's estimation, that the Product Planning Manager is a member of the top management approval committee on all product decisions, including pricing.

Having Product Design, managed by Herbert Gosweiler, placed under Product Planning seems to give it greater freedom than it has ever enjoyed at Philco. On the one hand, it has been separated from Engineering, and can have a major influence throughout the entire product development process, instead of being limited to a superficial styling job after engineering specifications are completed. On the other hand, Product Planning helps keep Sales out of the actual design execution once the direction of its work has been set. Another sign of Philco's high estimation of design is that it now makes design consultants responsible to the Product Design manager, instead of to the Product Planner, as had been its practice.

For advanced projects, Product Planner Allen coordinates the advanced design section of Product Design with the parallel group in Engineering. He gives design a strong position in this relationship, because he is on a level with the Engineering manager–who is a Vice President (indicating Philco's continued regard for Engineering). For coordination of current projects. Allen supervises Product Manager Jack Siegrist in following items through the development cycle. Philco has thus worked out a system that strengthens its marketing activities while leaving design untrammeled, that keeps a close eye to current competitive product development yet encourages advance planning.



Westinghouse: market planner plots trends

In the hotly competitive appliance field, where a drive toward volume means heavy weight on merchandising and styling, Westinghouse relies on product planning to raise its consumer product sales to 33% of its corporate total. The recent revamping of its Consumer Products divisions by their new chief Christian J. Witting and General Manager of Marketing and Distribution Richard Sargent is directed toward several goals: promoting more effectively the many new items in Westinghouse's broad line, creating stronger company- and cross-identification among its products, and shifting its footing from its commercial engineering experience to selling, as a major influence on design and engineering.

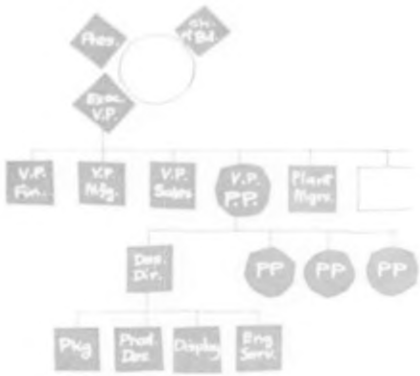
A little over a year ago, former advertising manager Robert M. Fichter was given responsibility for putting these goals into the Television and Radio Division's products, as its first manager of Product Development. Recently Fichter's title was changed to Market Planning Manager, and the change indicates how the job of product planning has shaped up at Westinghouse. Fichter heads up a group of three departments that join together to uncover market trends and formulate new products in line with them. These departments are Market Analysis (what people *are* buying), Market Research (how fashions, needs and other motivations will affect sales), and Product Planning (coordinating Industrial Design, Sales, and Engineering in the product development process).

The Market Planning Department is a new phenomenon, really a cross between marketing and product planning. Westinghouse has allowed it to have a strong influence on its operations: Fichter reports to the General Sales Manager and through him to the Division's General Manager, votes on the division management's Planning and Verification Committee and, together with Sales, is responsible for pricing strategy.

With the three market-oriented departments under him, Fichter can direct the development of products toward the market trends he uncovers, without leaving the marketing influence up to Sales, Advertising and Promotion. Like Philco, Westinghouse has defined product planning as a marketing activity; but, unlike General Electric, it has separated the distribution functions of marketing from the research func-

tions. Product planning is therefore free to use marketing information without being directly responsible to distribution managers with short-term interests.

Yet product planning isn't all marketing at Westinghouse: a New Products Department of 110, under the direction of physicist Dr. Robert Ramey, works in the Headquarters Engineering and Research Laboratories to do applied research on pure scientific discoveries, developing product proposals out of them for development by the divisions.



Ecko: VP directs design of a diverse line

Ecko's 69-year history is the story of its myriad housewares, built up over the years by diversifying the product line and acquiring smaller companies. To keep its facilities supplied with new products and to revise its line constantly to keep it up to date, Ecko last year converted its Merchandising Department into a Product Planning Department, headed up by Vice-President Henry Forster (ID, October, 1956). Forster advises Executive Vice-President Edward J. Keating on Ecko's design and merchandising policies, and keeps him supplied with new product ideas to diversify the already wide product line.

Because Forster recognizes that design is of major importance in making Ecko's simple products more saleable than its competitors', his staff includes not only three former merchandising men called Product Planners who handle product groups, but the Department of Design, directed by James Hvale. Product Planning also includes an Engineering Services group which is able to specify engineering and production requirements on the simpler products. Because Ecko has a highly complex organization made up of many scattered plants, Engineering Services acts as Product Planning's liaison with the plant engineers, while Product Planners stationed in the divisions report directly to the central staff in order to keep the planning process under control. Product Planning therefore is a kind of amplified design department, containing all the major functions of creation, participating in the actual design planning, and using its combined merchandising and design orientation for maximum control of the line's many features and many markets.

Capitol: designer assumes planning role

The bare figures of Capitol Products short history tell the company's story: Eugene Gurkoff started it four years back with $1,000 cash and a $3,500 G. I. loan, in the back of a rented garage; last year it sold $16 million worth of aluminum doors and windows, is expected to top $20 million this year. What is most unusual about this prodigious growth company is not the role of its designer-planner in developing products with such immediate success on the market, but his work in stimulating the invention of new products that are moving Capitol toward one of its ambitious goals —to become a widely diversified light metals fabricator.

Vice President of Product Planning Dean Minick, former Assistant Professor of Industrial Design at Syracuse Univisity, came to Capitol in 1953 with his own ideas on how product planning should be handled in a growth company. It is the industrial designer's job, he feels, to plan and create products from the original conception to the production specifications. This concept of design led him to set up both the design and engineering departments under him in an unusual way. Product Planning is divided into a Design Engineering section under Chief Design Engineer Heinz Mueller, Prototype Development Laboratories, and Design Research—his outside consultants, monitored by Richard Koontz. What is most striking is that each of the 13 staff designers and engineers is responsible for inventive ideas, detailed engineering plans, cost estimation, parts specification and construction of the working prototype for tooling by production engineers. It is this complete job—based on economically feasible marketing plans—that has made design at Capitol into a product planning operation.

Minick's conception of his proper role as a designer—to invent and create unique products—is close to the interests of a company that is inspired by its President's enthusiasm for diversification into new product fields. Gurkoff is developing production facilities with diversification in mind: Capitol gained extensive metal-working and machine-building plant when it acquired Read Standard Corporation last year, and is installing larger extrusion presses, melting and billet casting equipment. As Gurkoff's aide-de-camp, Minick helps him plan the company's growth by his product ideas — some of which will be released later this year. How succesful Capitol will be can perhaps be anticipated from its astounding growth curve but this small and ambitious company has already made an extension of the concept of product planning: the complete designer can function as a creative product planner.

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WHERE do new ideas come from?

PLANNING THE PLANNING: ANSUL REGROUPS FOR CREATIVE THINKING

Robert Hood discusses management theories

T-Flow refrigerant drier, with Dry-Eye wetness indicator

In 1949, when Robert Hood took over the Presidency of Ansul Chemical Co. of Marinette, Wisconsin, he brought with him an interest in sociological theories of group activity—particularly "participative management." Today the company stands as an experiment in translating that participation into a motive force in the entire process of product development. This has come about through Ansul's need to find new products to make most efficient use of its resources: in Hood's definition, its "resources" are its people, as well as its chemical and manufacturing equipment. To get them involved in the process of product planning, Hood has developed a working system that deals with how people create together, rather than formal management structures.

How Ansul's product planning process gradually developed from its experiences in searching for new products and new ways of working can be illustrated by the case of the Dry-Eye refrigerant drier (above, right). In 1952 Ansul, as a manufacturer of dry chemicals for fire extinguishers, performed only a service in the refrigeration field: it was a sales outlet for duPont refrigerants. The company thought it could get into the refrigeration business for itself—but only if it could manufacture a new and better product. The need for a systematic way to develop new products spurred President Hood in 1954 to appoint William Rinelli to the new job of Coordinator of Product Planning, to search out and screen ideas in a Screening Committee, together with the Vice President of Research and Development and the Technical Director.

Examining the areas that needed improvement in commercial refrigeration, Ansul found that refrigerant driers are used because water tends to get into the refrigerant fluid and render it useless. The Sales Department reported that customers wanted a drier that showed visibly whether the fluid was free of water. The possibility of using not only sales but all other departments as sources of product policy led to the formalizing of top management's role in the planning process: the Product Planning Policy Committee was formed of the President, Coordinator and the "area heads."

A team was set up in Research and Development to solve the problem by itself. It came up with the idea of using chemical litmus paper that changes color as an indication of wetness. This method of setting up the problem and assigning an informal group to its solution produced the Super Dry-Eye, introduced this year as the latest development of the drier-development process. Another "product" of the process was the establishment of the Product Investigation Team (PIT) system that lists on a roster all the members of the company whose knowledge may be needed in working out a creative solution to a product problem. In order to communicate the new theories and system to its entire staff, Ansul drew up the manual reproduced on the next eight pages.

ANSUL CHEMICAL COMPANY MARINETTE, WISCONSIN

Why Product Planning? I am sure everyone recognizes the important part that new products play in the growth of our company. For a number of years we have been working toward organizational relationships which would allow us to process and develop ideas and new products in a better way. Our recent decision to isolate the job responsibility of Product Planning is a significant step toward our objective. One of our basic company principles is to bring to bear upon our problems all of the available resources inside and outside of the company. Our new planning approach is aimed specifically at accomplishing this.

To meet this need we have established the position of Coordinator of Product Planning with the idea in mind that all areas of our business must participate and be responsible for the development of new products. This is a completely practical approach since all areas play some vital part in the final result by adding factually and physically to the product during its development life.

The detailed information assembled in this manual is a guide to help you in carrying out your responsibilities as a member of Ansul's Product Planning Program.

Bob Hood

PRESIDENT

a manual of procedures

PP

PRODUCT PLANNING

FLOW CHART OF IDEA TO PRODUCT

PRODUCT IDEAS ORIGINATE FROM MANY SOURCES

SOURCES: SALES, MANUFACTURING, MARKET RESEARCH, ADMINISTRATION, RESEARCH & DEVELOPMENT, FINANCE, OTHERS

IDEAS SENT TO **CPP** WHO COORDINATES THEM THROUGH **SCREENING COMMITTEE**

CPP REPORTS TO **PPPC** WHICH SCREENS RECOMMENDED IDEAS FOR FURTHER EVALUATION

PPPC ASSIGNS WORK PROJECTS TO **CPP** WHO FORMULATES **PITS**

PITS APPLY SKILL AND KNOWLEDGE OF ALL AREAS OF BUSINESS. PITS ACCUMULATE DATA, EVALUATE AND RECOMMEND.

PITS PREPARE REPORTS FOR PPPC WHICH EVALUATES, DECIDES, AND SCHEDULES

PPPC ASSIGNS PROJECTS TO **AREA HEADS** WHO CARRY OUT AND MAKE MONTHLY PROGRESS REPORTS TO **CPP**

CPP REPORTS PERIODICALLY TO **PPPC** FOR REVIEW OF PROGRESS

AREA HEADS MAKE OWN SCHEDULE FOR THEIR PORTION OF THE PROJECT AND APPOINT PROJECT LEADERS. AREA HEADS CARRY OUT OWN SCHEDULE (PIT ON CALL IF NEEDED.) COORDINATION WITHIN AN AREA CARRYING OUT THE PROJECT SCHEDULE IS THE RESPONSIBILITY OF THE AREA HEAD. COORDINATION BETWEEN AREAS IS THE RESPONSIBILITY OF THE CPP.

IDEA ESTABLISHED AS NEW PRODUCT

Basic Framework and Procedures

To implement the plan we have set up the following basic framework and procedures.

1. **Coordinator of Product Planning (CPP):** This job is created for the overall control and implementation of the Product Planning Procedure. The CPP is the liaison between all functioning agencies participating in the plan. He is responsible for the stimulation of submission and processing of new product ideas.

2. **New Product Idea Screening Committee (SC):** This committee is responsible for the preliminary evaluation of new product ideas and recommends to PPPC the advisability of further investigation of these ideas.

3. **Product Planning Policy Committee (PPPC):** This group is made up of all area heads in the organization. Its responsibilities are to plan for the future by setting broad company policies, to investigate and review products, and to make decisions as to whether these products will be manufactured by Ansul.

   This group is further responsible for scheduling work and assigning responsibility for work on actual projects.

4. **Product Investigating Teams (PIT):** These teams are created to carry out the work assigned by the Policy Group on individual projects. They supply the detailed knowledge and skills required to accomplish the work. By investigation and analysis they report to the Policy Group in such a way as to facilitate decisions. The Product Investigating Teams vary in accordance with the problem to be solved, being made up of those people best qualified to assist in finding solutions to individually defined problems.

It is important to recognize that the same people who do the investigation and make the decisions play dual roles in the company. The Policy Group is made up of area heads who are responsible for seeing that the job is carried through. The Investigating Teams are active staff members of the area heads who, in most cases, will carry out the detailed research and development necessary to produce a product.

The same people who participate in the planning are also responsible for the actual work — this approach reinforces another basic principle of our company—"People support what they help to create." We feel this organization and its process, coupled with our management philosophy will be even more effective in producing the products Ansul will need in the future. The chart on the facing page illustrates these Product Planning Procedures.

Coordinator of Product Planning (CPP) Description

A. BASIC FUNCTION

Responsible for providing the corporate function of coordination of Product Planning.

B. RESPONSIBILITIES AND SPECIFIC FUNCTIONS

1. Responsible for informing, advising and counseling the President in the areas of Product Planning.
2. Responsible for scheduling and establishing agenda for all meetings of the PPPC.
3. Responsible for the establishment, instruction and procedural guidance of PITs established by PPPC.
4. Responsible to report recommendations of PITs to PPPC.
5. Acts as chairman of PPC in absence of President.
6. Coordinates the reporting on progress of all projects and programs in accordance with plans, schedules, and budgets established by PPPC.
7. Serves the PPPC and PITs by assisting in expediting work on such projects and programs as may be requested.
8. Assists the area heads in selecting members of the PITs.
9. Responsible for the stimulation of submission and processing new product ideas.

C. COMMITTEE ASSIGNMENTS

1. Product Planning Policy Committee
2. Site Planning Committee
3. Product Investigating Teams
4. Screening Committee

D. BASIC ORGANIZATIONAL RELATIONSHIP RESPONSIBILITIES

1. Responsible to the President for the accomplishment of the duties and specific functions listed, special assignments, and assigned committee activities.
2. Responsible for informing, advising and counseling the President in the areas of major duties listed and on special assigned projects.
3. Responsible to coordinate his activities, cooperate and maintain liaison with all major areas of the company.
4. Responsible to use internal and external resources as required.
5. Responsible to the President for the effects the discharging of these duties have on problem and community relations.
6. Responsible to the President for compliance with all company policies and procedures by all personnel and for all functions under his jurisdiction.

New Product Idea Screening Committee (SC) Description

A. BASIC FUNCTION

Preliminary evaluation of all new product ideas.

B. PERSONNEL

The committee consists of the Vice President of Research and Development, Technical Director, Coordinator of Product Planning (secretary), and Manager of Market Research and Development.

C. RESPONSIBILITIES AND SPECIFIC FUNCTIONS

1. Discuss results of opinion survey of new ideas.
2. Obtain additional data where needed for preliminary evaluation. (Criterion: Sufficient data should be accumulated so as to answer the question — "Is this new idea good enough for Ansul to warrant the time and expense of a PIT?")
3. Make recommendations in written reports to PPPC for PIT assignment.

D. BASIC ORGANIZATIONAL RESPONSIBILITIES

1. The SC is a preliminary evaluating group that recommends to PPC the advisability of further investigation of new ideas.
2. The CPP calls meetings of SC as necessary for the evaluation of ideas which have been submitted to him.
3. The SC reports to PPPC.
4. The SC receives procedural guidance from the CPP.

Product Planning Policy Committee (PPPC) Description

A. BASIC FUNCTIONS

1. Establish product policies, set goals, and give direction on new product projects.
2. Evaluate and make decisions on all new product plans and schedules.
3. Allocate funds to carry out new product plans.

B. PERSONNEL

The committee consists of the President (chairman), Coordinator of Product Planning (alternate chairman), Vice President and the chief administrative officers of the following areas: Sales, Research and Development, Manufacturing, and Finance. The president's administrative assistant is secretary of the Product Planning Policy Committee.

C. RESPONSIBILITIES AND SPECIFIC FUNCTIONS

1. Review minutes of last meeting.
2. Screen and assign new product ideas to PITs or other investigating groups or individuals.
3. Evaluate accumulated data and make policy or action decision on recommendations of PITs or other investigating groups or individuals.
4. Establish a total time schedule on all new product projects.
5. Make assignments to area heads of their respective responsibilities in carrying out PPPC decisions on new product projects.
6. Review with area heads and CPP the monthly new product progress reports.

D. BASIC ORGANIZATIONAL RELATIONSHIP RESPONSIBILITIES

1. The PPPC has sole responsibility for action and policy decisions on products.
2. Since all area heads are members of PPPC, they have a dual responsibility.
   a. Making the decisions on new product projects.
   b. Carrying out of these decisions.
3. Members of this group may delegate responsibilities for (b) above to their subordinates, but responsibilities for (a) above may only be delegated to another member of PPPC.
4. PPPC as a group reports to and is directly responsible to the President.

Area Heads Description

A. BASIC FUNCTION

To accomplish new product projects as assigned by PPPC.

B. PERSONNEL

Areas Heads include the President (Administration), Vice President of Sales, Vice President of Research and Development, Director of Manufacturing, and Treasurer (Finance).

C. RESPONSIBILITIES AND SPECIFIC FUNCTIONS

1. Carry out the decisions made by PPPC on new product projects as assigned.
2. After PPPC decision, provide time schedule for their respective phase of new product projects and report to CPP.
3. Coordinate the various phases of new product projects within their area.
4. Submit to CPP monthly reports on new product progress.
5. To communicate and cooperate with CPP on solving inter-area coordination problems.

KEY E—EVALUATION PHASE
C—CARRYING OUT DECISION PHASE
S—STATUS SUMMARY AS OF THIS DATE
R—ESTIMATED REVIEW DATE BY PPPC

DATE

MONTHLY PRODUCT PLANNING PROGRESS REPORT FOR PPPC

PROJECT NO. AND NAME		JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.
	R								
	C								
	S								
	E								
	C								
	S								
	E								
	C								
	S								

Product Investigating Team (PIT) Description

A. BASIC FUNCTION

1. Starting with a specific assignment from the PPPC, this group investigates and evaluates specific ideas, products, or programs within the limits of its own technical knowledge and skills.
2. It is this group's responsibility to call attention to any further areas of specialized knowledge which are not available, or may have been overlooked by PPPC and to submit their findings in report form.

B. PERSONNEL

1. Area heads do not participate.
2. PIT participants are appointed by area heads in cooperation with CPP.
3. The criteria for membership are: The combination of skills and knowledge necessary to perform and contribute to meeting the specific objectives of the PIT assignment.
4. The composition of a PIT varies in accordance with:
   a. Type of project - chemical, fire-extinguisher, or refrigeration.
   b. Phase or stage of development of the project.
5. Ansul policy requires PIT participation as part of each individual's job description.

C. RESPONSIBILITIES AND SPECIFIC FUNCTIONS

1. Appoint a Recorder-Convener (see notes for a Recorder-Convener).
2. Review minutes of last meeting.
3. Discuss and plan the data requirements of the PIT task.
4. Assign to PIT member or members the job of accumulating the data requirements.
5. Estimate total time and date of completion of PIT task.
6. Establish future agenda and meeting time to report accumulated data.
7. Evaluate data.
8. Recommend a time schedule on the total project (usually in the form of a Gantt chart).
9. Make recommendations to PPPC for decisions.
10. Formulate interim or final reports for PPPC.
11. Meet to receive communication of PPPC decision on interim or final report.

D. BASIC ORGANIZATIONAL RELATIONSHIP RESPONSIBILITIES

1. PIT is an investigating group that accumulates data, evaluates it and recommends to PPPC for action decision.
2. The carrying out of the PPPC decision is the responsibility of the area heads. Usually the PIT responsibility ends with the recommendation to PPPC. However, PPPC may ask PIT to implement parts of an action decision.
3. All PIT tasks are assigned by PPPC.
4. PIT as a group reports to and receives procedural guidance from CPP.

CONDENSED CHECK LIST FOR PRODUCT EVALUATION

(Refer to "Evaluation Criteria for Products Ansul Manufactures" for detailed listing of requirements.)

The PIT must accumulate enough data to determine answers to the following:

1. Determine characteristics of product (potential end uses).
2. Determine total market per year and projected 5 years.
3. Determine Ansul's share of market per year and projected 5 years.
4. Determine manufacturing costs.
5. Determine selling price.

Answers to the above five items should be obtained at the initial stages of idea evaluation and product development. These answers may be approximate in the early stage, but must be re-estimated during development on a continuous basis to insure increasing accuracy as the project proceeds.

EVALUATION CRITERIA FOR PRODUCTS ANSUL MANUFACTURES

A. FINANCIAL ASPECTS

(See Financial Evaluation for Products)

1. Profitability
   a. Per cent return on investment, or $\frac{\text{Net Profit}}{\text{Cumulative Inv.}}$
   b. Profit pick-up, or $\frac{\text{S.P.} - (\text{cost} + X\% \text{ of S.P.})}{\text{SELLING PRICE}}$
2. Magnitude refers to net profit per year.
3. Time refers to the length of time required to reach our break-even point.

PRODUCT RELATIVE TO ANSUL

1. Research & Development
   a. Technically practical.
   b. Manpower to research and develop.
   c. Effect on other projects.
   d. Time in Research & Development.
2. Manufacturing
   a. Existence of suitable facilities and equipment.
   b. Time to manufacture.
   c. Number and types of skills required.
   d. Type of packaging.
   e. Raw materials - sources and reliability.
3. Sales
   a. Does it fit existing distribution organization?
   b. Needs for advertising and promotion.
   c. Impact on sales of existing products.
   d. Is it necessary to the perpetuation of our position in the field or the perpetuation of other products?
4. Management
   a. Is it within policy?
   b. Does it enhance the prestige of Ansul?

C. PRODUCT RELATIVE TO THE MARKET

1. Market Factors
   a. Patents.
   b. Restrictive royalties.
   c. Type of substitute products.
   d. Features over competition.
   e. Need the product fills (uses).
   f. Potential users.
   g. Size and trend of market.
   h. Potential customers' buying habits.
   i. Field testing required.
   j. Long-term outlook.
   k. Chances of success.
2. Competition
   a. Type and number of companies in field.
   b. Competitive prices on substitute products.
   c. Type of distribution used.

*The percent of general, selling and administrative expenses over sales dollars. This is a historical figure usually derived from the previous year and can change annually.

FORMAT FOR MINUTES OF PIT MEETINGS

PIT No. _____ Date _____

Subject _____

In attendance _____

Copies to _____

Background (INCLUDE NUMBER OF PIT MEETINGS AND TOTAL TIME INVOLVED) _____

Discussion _____

Estimated date of Completion of Evaluation _____

Conclusions _____

Next meeting date _____

Agenda for next meeting _____

TIPS ON A PRODUCTIVE MEETING PROCEDURE

A. BEGINNING OF MEETING

1. Be sure everyone clearly understands PIT responsibilities.
2. Be sure everyone clearly understands PIT tasks for the meeting.
3. Determine the procedure for this meeting. Most PIT meetings are problem-solving or decision-making meetings. The following steps should be followed for an effective meeting.
   a. Define the problem.
   b. Collect adequate information about the problem.
   c. Identify all possible solutions.
   d. Test all possible solutions.
   e. Determine the action or decision.
4. Budget the agenda for the meeting.

B. TO KEEP THE DISCUSSION PRODUCTIVE

1. Every member of the PIT has the responsibility of seeing that the following leadership functions are performed.
   a. Stating the problem.
   b. Clarifying its meaning.
   c. Keeping discussion focused.
   d. Summarizing.
   e. Determining the readiness for decision.
   f. Testing the consequences of a decision.
   g. Obtaining commitment to a decision.
   h. Making the decision.
2. Try to eliminate speeches.
3. Be sure everyone has a chance to express his opinion.
4. Listen to each point of view. Lack of listening is an area of difficulty in meetings.
5. Try to minimize arguments, to isolate areas of agreement, and to check for concensus.
6. Recognize and separate opinions from facts.
7. Summarize at the end of each major point, check that everyone agrees.
8. Test for reality as you go along — "Will it work?"
9. If a point is unclear, ask for clarification.
10. This is a team job, all ideas are group property. Minimize necessity for people to protect their own new ideas.
11. If situation warrants, use brainstorming procedure, e.g., break group into sub-group for study on same question.

C. END OF MEETING

1. Allow time for review of minutes at end of meeting by recorder.
2. Review any assignments for jobs for next meeting.
3. Prepare future agenda.
4. Restate time or when announcement will be made for next meeting.
5. Set a time limit on all meetings.

NOTES FOR THE RECORDER-CONVENER

A. BEGINNING OF MEETING

1. Be sure any special roles are identified.
2. Review responsibility of PIT.
3. Review minutes of last meeting.
4. Check for clarifications of minutes.
5. Request time budget for agenda.
6. Request estimate of total time and date of completion of PIT tasks.

B. DURING THE MEETING

1. DO
   a. Record selectively — don't try to be verbatum.
   b. Try using a form with columns labeled "agenda idea," "bright idea," "agreement or decision," "conclusions" and "major disagreements."
   c. When in doubt about the group's opinion on a point, ask the group to check the accuracy of your record.
   d. Be ready to give a summary of what has been done if the group requests it during the meeting.
   e. Summarize discussion at the end of each major topic — check that your record accurately reflects group thinking.
   f. If group wanders or gets into arguments, ask group what they want in the record.
2. DON'T
   a. Don't try to take down all details of the process but rather concentrate on the content.
   b. Don't hesitate to ask group to correct and amend your record when you are in doubt.
   c. Don't fail to work with whole group in planning what records are needed in this session for which you have taken responsibility.

C. END OF MEETING

1. With the group establish time for next meeting and report time to CPP.
2. Distribute minutes and reports to PIT and PPPC members.

New Product or Model Release

DATE _____

PRODUCT _____

PART NO. _____ PIT NO. _____

MANUFACTURING COST

Material _____
Direct Labor _____
Variable Burden _____
Standby Burden _____
Total _____

INVESTMENT COST

Development _____
Tooling _____
Working Capital _____
Total _____

MARKET POTENTIAL

First Year _____
Second Year _____
Fifth Year _____

SELLING PRICE

List _____
Wholesale _____
O.E.M. (35%) _____
Average Take _____

% NET PROFIT

Manufacturing Cost _____
Admin. Burden (35% of Take) _____
Net Profit (Before Taxes) _____
Total (Take) _____

NET PROFIT / TAKE = _____ = _____ %

% RETURN ON INVESTMENT

No./Yr. X Net Profit / Investment 1st Year = _____ = _____ %

EST. DATE AVAILABLE TO SALES _____

CHECKED	BY	DATE	CHECKED	BY	DATE
Production Engineering			Sales Analysis & Control		
Planning			Market Research		
Operating			Development & Design		
Sales			Patent Committee		

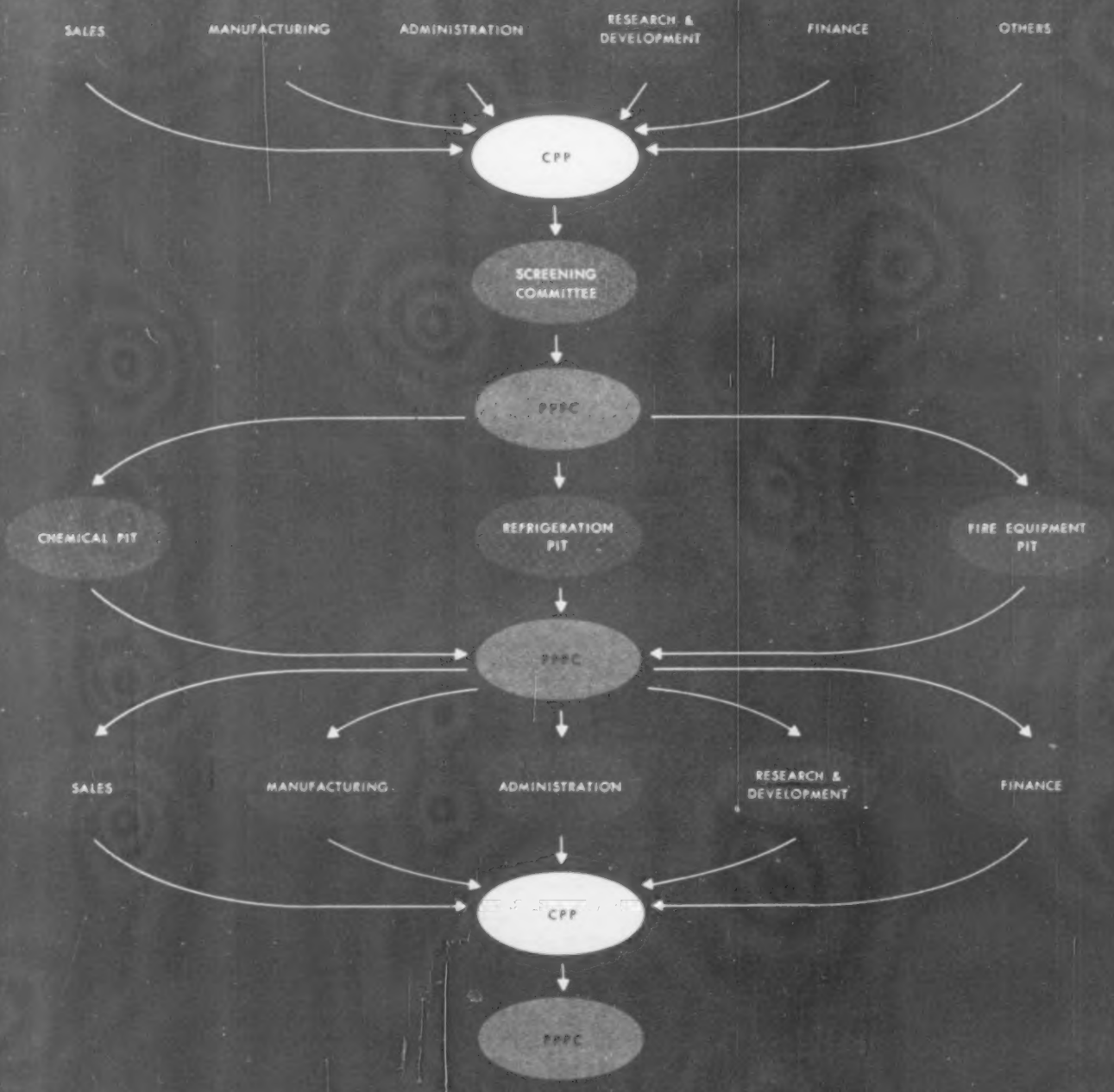
APPROVED

Executive Committee BY _____ DATE _____

*Form shown is for refrigeration products. Fire equipment and chemical products forms differ slightly.

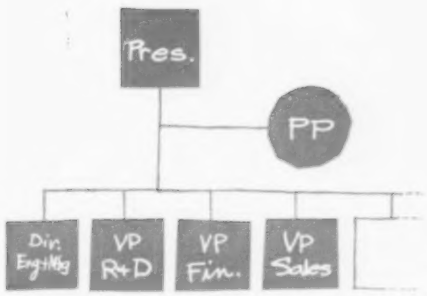
PP

Organizational Format for New Product Coordination



Coordination among PIT groups and among Area Heads both on a project and between several projects is the responsibility of the CPP.

Planning session meets around coffee table in Hood's office



Ansul's ideas on using resources

Ansul's method of using its resources is unlike any other complete company system. It is based on some of President Hood's theories about group relations: 1) resources ("People, not products, are the real competitive difference"); 2) creativity *vs.* action; 3) involvement—in place of individual identity ("People support what they help create"); and 4) meeting procedures for maximum communication.

1) Hood's interest in groups and creativity stems from the conviction that all available "resources"—inside and outside Ansul—have to be used efficiently if the company is to grow and prosper. It was by calling in such outside resources as management consultant Richard Beckhard and planning-oriented design consultants Latham-Tyler-Jensen, among other consultants, on all manner of company problems, that Hood developed the present product planning system out of Ansul's previous experience. The system is geared to make use of all specialized knowledge in Ansul's personnel, especially that of "execution" personnel who are to be responsible for working out the project. Almost every member of Ansul's staff and its consultant force is listed in the Product Investigation Team roster: it is part of each job description to be on call for work on new product proposals.

2) By dividing creativity from action, recommendations from responsibility, Ansul opened the door to new ways of working in the company. The PIT teams are set up only as *problem solvers;* they make recommendations only; their province is creative thought, not action. Action and decisions for action, are instead the responsibility of top management (although Hood believes that managers must play a creative role, too). This fundamental distinction has led to two different ways of organizing groups at Ansul. The PIT teams are composed of peers: no boss can be selected to serve on the same team with one of his subordinates to make sure that creativity and comunication are not blocked by the needs for prestige and job-security (see page 76). Since no one on the team has authority, no action can be taken, but all members are free to contribute their ideas. The Product Planning Policy Committee, in contrast, is set up along traditional lines, with the President at the top and his vice-presidents around him to help him make decisions on all product projects.

The top men who make policy with the President are also "area heads"—the chiefs of the operating departments who will be responsible for following up on project decisions. This dual role insures that no decision can be tossed in someone else's lap for action.

3) Since the work group is clearly recognized as the important element in Ansul's management and in problem-solving, each individual has to be involved in the process in order to do his best work. Since this means some loss of individual identity and credit, Ansul has had to analyze ways of motivating people to be creative in groups. Hood finds that the reward of identification with a good group result, and the satisfaction of contributing to a team, are very effective.

Getting people to participate creatively has led to a new set of situations for managers and consultants in the company. An example is the relationship with Latham-Tyler-Jensen. As continuing consultants—rather than visiting experts—they participate as anonymously as any other group members. They do little actual design at the boards, compared to time spent in meetings with Ansul personnel. But they believe a great deal of design gets done this way: in working through problems in person in a dynamic situation, staff specialists are stimulated to contribute their ideas, to feel themselves part of the result, thus to maintain their enthusiasm in carrying out the project.

4) Ansul has developed an elaborate system of meeting techniques, based on theories about group communication, that helps group creativity actually work. Both the planning meetings in the President's office and the problem-solving sessions of the PIT teams are held without formal seating arrangement, in order to focus attention on the problem, not on a boss or leader. Chairs face a "working wall" where large sheets of drawing paper are hung, and anyone can move around freely to write his ideas on paper, or express them visually. These sheets become the basis of future work.

In spelling out this system for turning a staff's best thoughts into better products to manufacture, Ansul has made it everyone's job to participate in planning. The system has not been in full swing long enough to show many tangible results—"But," says Hood, "we have screened out countless ideas that didn't quite fit us, and that is just as important a job for product planning."

Informal PIT team analyzes problem-solving process

PP

WHERE

Split up the problem and assign a new team of experts to each feature and phase, advises a practicing planner at G.E.

It is possible, according to K. C. Frankenberry, a product planner at G.E., for a company staffed with competent product planners to commit hair-raising planning errors. For example, it is not unheard of for a major corporation to spend a good deal of time on the development of a product that violates known customer preferences. Engineers may go to work on expensive models for products that are theoretically very promising but happen to have no immediate market, or products that might prove very successful *if only* the company had the appropriate distribution system. The problem is not that these products will fail—they probably won't reach the market. The problem is wasted time, wasted money, misdirected talent. These are failures that can happen even with product planning: they can be prevented from happening, according to Frankenberry, by a systematic approach to product planning. His answer, "A Team Approach to Product Planning," was worked out last year, when he was a member of the product planning staff at G.E.'s Dishwasher and Disposal Department in Louisville. The attention that has been paid throughout G.E. to Frankenberry's mimeographed description of his process—and the fact that he developed it in the first place—are evidence that G.E.'s policy of spreading responsibility really works.

Frankenberry's aim in developing this system was to make product planning as efficient, as productive, and as rewarding to those involved as he could. A major point is that expensive development work should be put off until the product has been outlined in some detail. The system is predicated on a typical situation in G.E.'s major appliance division: a new model of a familiar product must be ready for the market in 196x. Presumably, however, the system could be adapted to other situations; for example, the development of an entirely new product by a company whose product line was not so settled. Here, in abbreviated form, is how Frankenberry explains the reason for a team approach:

A team approach

How are products created? *Management* of the company expresses the need for a product. The need is relayed to the *organization*, which produces a product proposal. The proposal must be reviewed with *Management* for alteration and approval. Finally, the proposal is executed by the *organization*.

The Product Planner communicates the product need to the organization and guides the approved proposal through the execution phase. However, he is primarily concerned with *utilizing the human resources of the organization to produce the best product proposal for management's consideration*. Since a product proposal is truly a combination product specification and business proposal, it is apparent that all functions of the organization must be a party to its formulation, and therefore the Product Planner must utilize the human resources of all functions. Manufacturing, Finance, Engineering, and Marketing must contribute equally.

The combination of these groups suggests a pattern of team work. It seems logical to expect that a team approach to product planning will best integrate the human resources of the organization. It must be recognized, of course, that planning teams cannot be held responsible for the planning of a product. That responsibility remains with one person: the product planner.

To some degree every product planning system aims to get certain decisions made before money is thrown into development work. But Frankenberry's system isolates the early planning stage to an unusual degree:

The span of a product may be divided into four phases: conception, execution, production, and distribution. In the conception phase, the product exists mainly on paper and is delineated with product specifications and appearance renderings. During the execution phase, the specifications and renderings are reduced to practice (product designed) by Engineering. This is the initial step toward the physical completion of the product. In order that Engineering may be able to reduce the specifications to practice in the most economical and efficient manner, they must be presented to Engineering in written form with all known elements of the product included. Most consumer goods products can be broken into these elements: Sales Features, Appearance, Geometry, Pricing, Model Breakdown, Sales Volume, Starting Costs, Tooling Costs, Capital Equipment Economics, Production Schedule, Consumer Education Requirements, Safety Requirements, Application and Installation Requirements, Detailed Specifications of Performance, Suitable Methods of Evaluating Performance. Omission of any of these elements from the specifications will reduce the efficiency of the execution phase.

Stage I—Separate features

These elements are in reality problems for which answers must be found in the form of Product Specifications. The most rapid and sound solutions to each problem can be obtained from people in the various Department operational functions. To accomplish this, selected teams can be assigned to each problem and charged with the responsibility of rendering a solution in the form of written product specifications. For team assignment, some elements can be combined; others may need to be expanded to cover every aspect of performance. For example, in setting up teams to write specifications for a 196x dishwasher, performance and evaluation methods were separated into Noise Level, Capacity, Loading Characteristics, and Washability-Drying. Typical personnel assignments appear like this.

Each team produces a written specification, which is inserted in a loose leaf binder entitled Product Specifications. Minutes of all meetings are added in an appendix which records the basis for all group decisions.

In some respects, the specification teams can be compared to Ansul's PIT's. They are made up of people with specific technical skills, who will actually execute the specifications. However, the splintering of the product into elements which are considered separately is quite different. The aim at this stage is to write ideal specifications for each element without regard to practicality. In other words, although the teams have a very specific goal, their meetings are essentially creative. To encourage this, financial and production men are omitted. Individual specifications will be compromised later by higher-level teams.

does the planner get his plans?

In designing the 196x dishwasher, the specification teams met in what Frankenberry calls the "war room," a room which he furnished with a lineup of all competitive dishwashers, charts analyzing the market, and charts of all the teams with names of team members and their meeting schedules. There was no telephone.

Individual teams might require one meeting or several, and meetings lasted from a half hour to four hours. In addition to serving as chairman, the product planner represented marketing whenever required: since Frankenberry felt that four members made an ideal group and five were the limit, he "could not afford" a non-participating chairman.

Frankenberry emphasizes the importance of choosing people who will work well together:

Since the effectiveness of each team depends on its members, care must be exercised in their selection. In choosing members the planner must consider their ability and whether their specialized knowledge is applicable and their area of contribution will be recognized by the group. Each member must have equal status on the team—job level tolerance should be held to a minimum. A sound team system will not necessarily produce desired results; creative people must be recruited.

So far this sounds a little like brainstorming. It seems fairly obvious, however, that a large manufacturer cannot arrive at a major model change by a process of brainstorming—the specialists working on the problem have a store of knowledge on the subject and presumably they and their departments have already given a good deal of thought to future product possibilities. Frankenberry explains how they bring this background to the specifications teams in this way:

It should be emphasized that the team meetings are work sessions at which group conclusions and compromises are reached and decisions are made. Usually the individual members will spend much more time preparing for the meetings by securing test data, producing renderings, and similar activities, than they will spend in the meetings. Work done outside may be more important to the team's objective than work accomplished during meetings. A group or team itself is not especially creative—the individual working alone is creative. However, a meeting of persons with common interests and a clear objective can provide a stimulus to individual creative thinking outside the group which would help solve group problems. A second beneficial element inherent in team work is the obvious efficiency of communication. A meeting of persons representing various functions of the organization will also ensure that necessary compromises are made at an early planning stage, before expensive execution work is done.

Stage II—The whole product

The specification teams exist only to write ideal specifications for individual aspects of the products. Then they are disbanded. The next step is to combine these specifications and iron out any incompatible elements.

Although the teams will give only moderate consideration to the effect of one element on the others, they are indivisible from a practical standpoint. For example, an extremely quiet dishwasher may have wash water velocity reduced to a point where washing performance is adversely affected. The need for a modification team is apparent. It must have a broader outlook than the individual teams and should be better able to comprehend the relationship of the various elements. This group can be called the Feature Relation Team. In general it should represent Advertising and Sales Promotion, Industrial Design, Product Evaluation (testing) and Product Design, and have the Product Planner as chairman. It is important to note that the Feature Relation Team is much more consumer oriented than any of the Specification Teams. In general it will modify the specifications in the direction of the best compromise for the consumer. The Feature Relation Team's work culminates in a product specification that has been modified to meet the interest of all participating functions and okayed as practical from an execution standpoint by Engineering, and is basically consumer oriented.

So far the sole aim has been to develop the best possible specifications, and questions of cost and profitability have been completely disregarded. Once they are introduced, however, Financial and Manufacturing functions play a major part in Frankenberry's method:

Stage III—Business proposal

Actually, the term "product proposal" is a general one meaning product specification or description *and* business proposal. There can be no such thing as a pure product proposal since any new product will result in a new business situation. When the initial product proposal is made, the organization has the opportunity of performing a distinct service for its Management by providing a definitive product specification and by indicating the effect of the new model on the overall business operation. A prediction of interim changes in the present product up to the introduction of the new model is also required. If these elements—new product description, interim product change, and a business or financial forecast are presented to management simultaneously, the organization will have provided the information necessary for proper assessment of the new model.

At this point, the Feature Relation Team is disbanded and a new group is formed to carry the "modified Product Specifications" a step further. This is the first group that represents all major company functions.

The specifications must now leave the pure product planning phase and enter a combined product planning and business planning phase. To all the tests the specifications have passed must be added the most important test of all: will the proposed product produce a reasonable profit. This calls for a new group of qualified persons:

PP The team approach

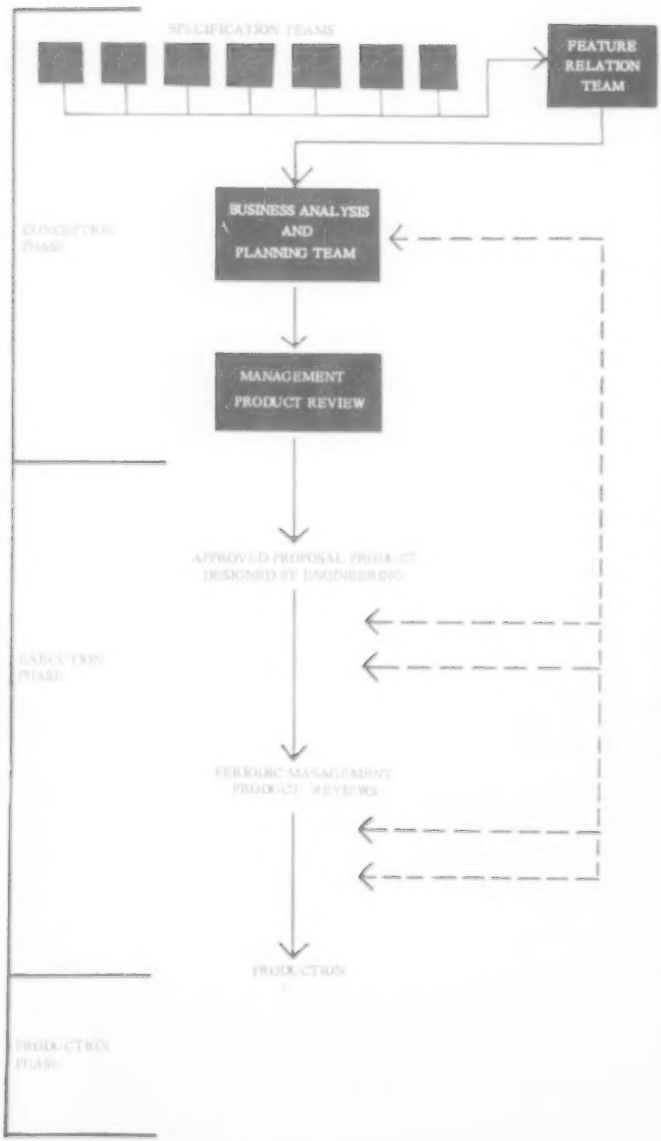
The Business Analysis and Planning Team may again modify the Specifications. However, their primary objective is to produce a five-year product forecast and a five-year business forecast. The product forecast is necessary to show proposed changes in the product between the present and introduction of the next major model change. The new model product specifications and the product forecast are used to establish the business forecast.

When it reaches its first management review the product proposal is remarkably complete. This is feasible because although the teams have used engineering studies, market research, drawings, etc., they have not invested heavily in specific development work.

A guiding rule for all teams can be that their work should be confined to paper, wood, or plaster. Expensive working models should be avoided until Management approval of the product proposal is given. This rule may seem restrictive; actually it allows freedom for drastic modification without concern for the abnormal expense involved in changing working models.

As the product progresses into the execution phase, it remains under the aegis of the Business Analysis and Planning team, which is chosen for this role because it represents all functions.

The Business Analysis and Planning Team takes the form of a continuing body in the sense that it will follow the product through the execution phase. Each member must be constantly alert to factors in his area that will affect the proposed product. The team should meet at regular intervals of approximately one month to review progress. Changes in product and business climate during the execution phase require revisions in the product plan. An up-to-date, dynamic product plan in the hands of proper persons in each function can be a great benefit in advance planning in many areas of business.



First success

In its first test last fall, Frankenberry's system proved to have distinct and sometimes remarkable advantages. The specifications for a major model change were arrived at in two months. During this period engineering work was held up, but since "many bridges were crossed that usually come later," Frankenberry feels that the system may actually have saved as much as six months of development time. It is difficult to estimate cost savings, but the elimination of premature model-making and development work presumably made a considerable difference. But perhaps the most striking result was the effect on the people involved. The teams worked faster than expected and "consistently pushed the specifications beyond the performance level expected." Project designers and engineers generally prefer working from exact specifications to the earlier trial-and-error methods, and they appreciate the role they played in writing the specifications. Membership in the business planning and analysis team was considered so beneficial in giving an overall picture of the company that the various sections represented have decided to make this a rotating assignment.

These human successes are not unexpected by-products of the system but one more result of careful planning. Frankenberry made sure that team assignments went to the people who would actually execute various elements and that they got full credit for their work. He arranged the system so that the product proposal moved through every level of the organization. For good measure, he set up the specification teams in a faintly competitive atmosphere.

WHAT does Product Planning mean to the designer?

So far in our story, a number of companies have officially given the product planner a job that was perceived, proved indispensable, and honorably won by the industrial designer. This is the job of coordinator of the product line — the man with the long view of things, who reconciles opposing opinions, cuts across division lines, meets research with insight, achieves unexpected solutions through a better definition of the problem. The designer can honestly say *he* knew all along that the consumer was the target, that problem-solving is an art. If all this is true, where does product planning leave the designer? Why isn't every product planner automatically a designer?

There are as many answers to this question as there are designers, design departments, and planners. Certainly no law says that a product planner can't be a designer, and many are (Cal Graser of G.E.'s Housewares Division and Dean Minick, author of Capitol Products' strong product planning set-up, are examples). But many designers are glad to be free of the job the planner has taken over; a few have found he enables them to contribute much more than ever before. The planner's job, as most planners see it, is not to create solutions but to obtain them. This he does by collecting all the pertinent facts and informed opinions within reach. *Then* he must see that they are usefully interpreted — that something is created from them. The latter is a job he cannot do alone.

It seems clear that product planning is one part of the design process isolated and blown up to new proportions. In some cases, it belittles design, but if it is organized to take account of the creative element it should be a boon to design. For product planning is an activity with a design bias. What it means to the designer is largely a question for the individual designer to answer. A sanguine view of the possibilities is presented on the following pages.

PP

APPLIANCE PARK: PLANNING MESHES 5 INDEPENDENT BUSINESSES

C.K. RIEGER
Division General Manager

Room Air Conditioners

Manager Marketing

Manager PP Ring

Household Refrigerators

Mgr ID BecVar

Manager Marketing

Manager PP Bartlett

Dishwashers and Disposal

Manager Marketing

Manager PP Christie

Ranges

Manager Marketing

Manager PP Mellem

Home Laundry

Manager Marketing

Manager PP Amthor

Under the free and flexible system of G.E.'s Louisville division, industrial design and product planning are resources for each other

Appliance Park, covering half of a 1000-acre Louisville site with six sprawling single-story factories, is the biggest single manufacturing unit ever built at one time. It makes a major appliance every 2½ seconds.

In front of the six Departments, each with its own factory, (refrigerators have two buildings; Television Receivers are made in Syracuse) sit six General Managers. Each in the G.E. pattern of true decentralization control, runs a totally independent business, reporting his results to the Division's energetic General Manager, C. K. Rieger. Despite their physical independence, the Department managers have a large problem in common: all make appliances that are directed at the same homes and, by and large, at the same room in the house. Not only does this suggest the need for some coordination in the name of customer relations, it necessitates some physical integration to back up the selling effort. For the kitchen, in which four have a major stake, is a rapidly changing area — and the direction of that change tends more and more to bring together their products, either to unify or to transform them.

The way product planning has been set up in Louisville is an interesting example of a system that achieves the two extremes that are inherent in the G.E. organization: independence, and harmony. Industrial Design has turned out to play an important part in bridging these extremes.

Five men with plans

In all of the Louisville Marketing Sections, the development of product lines is supervised by five Managers of Product Planning with basically the same job description, and they have other things in common too. All of them started as engineers, and most have been with G.E. for a good share of their careers. Several were "commercial engineers" with subsequent merchandising experience before taking the new job title. All but one has a staff of one or two "product planning specialists," who assume some special areas of responsibility for them.

When it comes to working methods, differences among the planners seem sharper. Dick Christie and K. C. Frankenberry's comprehensive team system for advance planning is in contrast with less formalized meeting procedures in other Departments. "Future planning" is a job in itself for Rye Amthor, while Clint Ring does not separate it from the total planning responsibility. Some are research-oriented, others rely heavily on collaboration with industrial designers. The differences reflect, among other things, the leadership of their General Managers, and the relative position on the growth curve of their particular kind of product. They also reflect the latitude of the Louisville set-up. G.E. offers no pat formulas for successful product planning. It leaves to the planner himself the decisions about how to get the best products created for his Department. Since all of them are competing with more or less the same resources at their command, their effectiveness tends to depend on *how well* they utilize those resources. And Industrial Design is one of their key resources.

Design plans for the future

Arthur N. BecVar's Industrial Design section, as mentioned on page 47, is one of the few centralized service groups that serve all five Louisville Departments, as well as TV Receivers. Administratively it happens to be a section under Household Refrigerators (on a par with Finance, Manufacturing, Engineering and Marketing) but its services are available to any of the other Departments through their product planners. BecVar himself is a member of all six of the Departmental Product Review Committees, which involves the Product Planning Manager, Department Manager, and General Manager Rieger.

Industrial Design's working system is based on "account" designers, who work regularly with a given Department. On the Range account, for instance, designer Ned Harrison not only directs the execution of the final design, but takes part in the earliest planning sessions with planner Lou Mellem and Marketing, Engineering and management representatives. He, in turn, works with a "staff" of several men within the design section, who may be revolved from project to project as the work load dictates.

The centralized design group, BecVar feels, has a number of advantages: it enables them to maintain an excellent model shop; it gives him latitude in managing personnel assignments, and the entire design staff of 35 gets a greater breadth of experience than they would in separate studios. The account designer is able to become as familiar with one Department's problems as he would in a specialized design unit, but also to participate in a diversified group with its exchange of ideas and exposure to a larger design picture. Perhaps most important, the section that executes all the Divisions' designs is a natural point of coordinating among Louisville products: I.D. correlates dimensions, style, and the total character of the appliances made in Louisville and, as it works out (page 74), has a good deal to say about their future direction as well.

PP Five men with plans for G.E. appliances

C. E. Ring, Manager of Product Planning in the Room Air Conditioner Department, sees the product planner's role both as a coordinating and as a creative one: "He must certainly not overlook possibilities of developing new ways of doing things. The total process depends heavily on projection—on imagination—in setting goals. Market research can help, but it can't do the whole planning job."

In developing the "Thinline" air conditioner, for instance, the goal grew out of projections about the ideal unit. Early air conditioners were made with in-line components on a base pan, for easy assembly. Ranging from 25 to 35 inches deep, they normally projected about 12 inches into the room. Later changes made it possible to install them flush with the wall—but this only increased the outside projection. In RAC planning meetings, there was frequent talk about the desirability of lessening this bulk—and Engineering took this on as a project. When research reached a point where it seemed technically feasible to alter radically the in-line arrangement, the Thinline became a specific planning project subject to a series of more detailed specifications on performance and appearance. The new unit, introduced in 1955, was 16½ inches deep, a 36% reduction in total cubic volume, and capable of being installed flush with inside or outside walls or in casement windows. Pointing to the future, from Ring's viewpoint, Thinlines in the new Louisville plant are entirely built-in, individualized control units for both heating and cooling.

Marshall Bartlett, Manager of Product Planning for the Household Refrigerator Department, finds his major job is not essentially one of creating new product lines, but creating schemes that motivate other people to produce new ideas for consideration. "An efficient planning process depends heavily on the planner's ability to communicate. The best plans by the best strategist are doomed if he cannot stir conviction and understanding throughout the organization."

Bartlett relies heavily on two sources of new ideas: Engineering and Industrial Design. The department's work load regularly employs three of BecVar's design staff, and how closely they work with planners is shown in two refrigerator developments. Both refrigerators had their start in 1952 when the Industrial Design section presented to management the thesis that appliances should be more in keeping with the changing architecture of the home, and the growing importance of the kitchen as a family room. About the same time, Engineering had developed a thinner insulation for refrigerator walls and was seeking good applications. With product planners and engineers, the designers studied new refrigeration concepts, and concluded that a wall-hung unit would best exploit the innovation. The designers then took over, and developed several alternate solutions, one of which was chosen. On the basis of this Product Planning made a set of specifications for the first prototype—putting special emphasis on convenient inner dimensions, and on a height and width that would suit the average kitchen.

The first model, used as a room divider with doors on two sides, was displayed at the Merchandise Mart in January, 1953. Planners found that the unique design appealed to consumers more than the thin walls. It required further surveys, revised specifications, another display of a working model, and later revisions by designers and engineers before the wall refrigerator was finally marketed in 1955. The latest modification is a self-supporting frame (below) that makes it free standing.

During this time, product review committees were also studying the future of the standard line: Consultants Latham and Nelson agreed with the objective of more architectural appliances, and in 1955 Department management agreed that square, built-in lines were a valid goal for all its products. The designers first suggested aligning the refrigerator cabinet with standard base cabinets, with only the door protruding. The Engineering Manager proposed that the appliance could be made truly flush by removing the condenser coils at the back. His section undertook to redesign the condenser, and a special hinge to open the door flat at a 45° angle to the wall. (For clearance, revolving shelves were added to all models the next year.) In 1957, G.E. introduced the first model that fit completely flush with base and overhead cabinets. A "built-in" without installation problems, it was a unique and practical design solution (left) and not just a new square "look."

R. L. Christie, Manager of Product Planning for Dishwashers and Disposals, is now trying out the new team approach described on pages 66-8, which Christie feels builds a sound and rational platform on which present and future plans can be made with constant reference to the business forecast, schedule of changes, tooling investment and financial risk.

Christie draws a clear line between day-to-day and future planning: he feels that one of his staff must be totally free to concentrate on long-range thinking, while the other deals with immediate problems and pressing product changes. The Mobile Maid dishwasher, for example, has developed out of strategic decisions from model to model. The first portable dishwasher, in 1949, round in shape and manually controlled, proved unpopular because it was hard to fit into a kitchen. A temporary portable was made in 1951 by adding casters to the undercounter model, while planners studied the marketing results and concluded that the mobile unit would be saleable if it was automatic, easy to install, and square in line. The redesigned Mobile Maid, introduced in 1955, was followed by this year's model (below) that included a major improvement—a flush-away drain that eliminates scraping.

Believing that a designer's creative contribution is best made without interruptions, he insists that all contacts between the account designer and *all* members of the Department be handled through the product planner.

L. R. Mellem, Manager of Product Planning in the Range Department, operates as a staff of one, and consequently relies very heavily on the creative resources of both Engineering and Industrial Design, and on G.E.'s Consumer Institute (for testing), partly because he sees the product problem of ranges as a somewhat special one.

The range, unlike other appliances, is not only a work-saver but a device that helps the consumer in a creative function. Since all models in a line must offer basically the same capacity, value depends primarily on appealing features. The 1956 plug-in griddle demonstrates one innovation that came about for this reason. Most surface griddle units are bulky and hard to clean because of their imbedded coils. G.E. engineers and designers, working with Mellem, plotted out a new kind that would eliminate the heating element by using the range's surface units. They developed a solid one-piece slab that plugs into the backsplash, linking the front and back coils so that the griddle is automatic as well as lightweight and submersible. Features on this year's line of ranges, in addition to a fold-down plug on the griddle for easier storage, include a removable oven door for cleaning, and a gently raised edge on the range top to prevent drippings from spilling to the floor.

F. R. Amthor, Manager of Product Planning in Home Laundry, emphasizes the planner's responsibility for interpreting the customer's unrecognized wants and needs, and works closely with Marketing Research in obtaining information that will help him project images about who this customer will be in a decade, what kind of product she will want.

His two Product Planning Specialists take charge of immediate planning of automatic washers, dryers and combinations, while Amthor himself works on future planning. He believes, in contrast to some of his colleagues, that it is the planner's responsibility to propose product ideas as well as to stimulate ideas of others.

A typical problem was posed to Amthor's newly-founded section in 1953. G.E.'s first automatic washer and dryer with "backsplash" design had just been introduced. Top and backsplash were a large one-piece unit and, because of its size, minor appearance changes became major manufacturing changes. The washers and dryers also had dissimilar dimensions, causing short runs and high inventory.

Product Planning established new objectives for the next complete change: 1) To design both units as true twins, to reduce tooling and shipping costs, inventory and investment, 2) To reduce the number of parts affected by any model changes, both for economy and for flexibility between deluxe and low end models. In a series of steps, planners and designers tried solutions to this objective: changing the cut-out door to a flat panel, creating a break in the top, enlarging the backsplash and giving it more shape. Finally, the designers came up with the elevated control panels that offered variation without major tool changes, flat tops and square lines to suit the more architectural spirit of the kitchen.

PP

WHAT PRODUCT PLANNING CAN MEAN TO DESIGN: At G. E. in Louisville,

Design triumvirate — *BecVar (l.) and consultants Nelson (top) and Latham—participate in planning through a sliding scale of consultations: 1) Periodic reviews of each department's products, and long-range plans; 2) Meetings with "account" designers on current projects; 3) Biennial meetings with all General Managers; 4) Yearly reviews with C. K. Rieger on product policies for Division as a whole. Consultants also carry away projects to be developed by their office staffs.*

Arthur N. BecVar, whose staff designs G.E. appliances in concert with the planners on the previous pages, is a significant figure in the planning process at Appliance Park. The ultimate success of his job depends as much on intangible attributes and attitudes as it does on meeting the specifications of his job as Manager of Industrial Design. BecVar welcomes the help of the product planners, believing that planning is an essential ingredient of all design activity. And he has made it his business to offer them a maximum number of creative resources, believing that creative insight is design's big contribution to the solving of all manner of problems.

Management, interestingly enough, has spelled out many of his responsibilities for planning. BecVar is charged not only to produce designs and coordinate product lines, but to handle new and experimental projects that fall between departments. His job description lists such specific duties as "helping in policy-making for the Department," "working closely with product planning managers to get commercial specifications for design," "stimulating long-range thinking with experimental projects," and finally, "contacting outside sources of creative ideas to insure leadership for the Division's product program."

These last two duties highlight the latitude of the designer's role in Louisville. Industrial Design becomes, in effect, an advance planning unit for the entire Division—and in many cases works closely with Division manager Rieger in mapping out broad directions. (The Unit Kitchen concept first sprang up in BecVar's group, and was aided by design consultant George Nelson; the experimental food center, right, is the latest result of design investigation.)

As liaison with design consultants, BecVar has worked regularly for 3 years with two firms: George Nelson Associates and Latham-Tyler-Jensen, using them not only to augment and stimulate his own staff, but to introduce a broader design viewpoint into the whole planning process. Nelson, Latham and BecVar function as a unique triumvirate, in an effort to offer the Division an anonymous, collective resource for all kinds of planning and problem-solving. BecVar spends substantial time setting up necessary conferences between the consultants and planners, engineers, designers, and General Managers, on both immediate and long-range problems.

How does the Planner affect the role of the staff designer? BecVar feels it helps him—and gives him a bigger job to do. At the same time the planner backs up the designer with his skill as an administrator and communicator, he passes on more responsibility for mature problem-solving. In the more scientific system of product creation that accompanies product planning, the designer inherits an obligation—and an opportunity—to exercise his unique ability to solve problems *intuitively;* but he must now work with more serious regard for the realities of business, and the need for genuine product improvement through *design* rather than styling.

The flexible role of Louisville planners stimulates them to use every available resource, and the way they have utilized design shows how the two roles can be complementary and non-competitive. The planners' status is not remarkably high, but their power is: they make it possible for designers to contribute their best. And that best, the Louisville planners often find, is one of the best resources available for dealing with any problem that a big corporation, or a competitive market, can pose.

a bigger stake in the company's future

Experimental programming cooker (*XPC-1*) *was developed in the Industrial Design Section at Appliance Park, which is responsible for investigating new appliances that take in more than one product department. The idea was sparked when Industrial Design Manager BeeVar predicted, in a speech, the influence of automation on cooking: "It should be possible to add the convenience of existing technology to the kitchen without eliminating the creative element in food preparation." BeeVar's designers began to investigate ways of exploiting the extra speed of the electronic oven by linking it with freezer storage; they prepared renderings of their concept for a Board of Directors presentation, and the idea aroused so much interest that C. K. Rieger authorized BeeVar to proceed with a working model.*

Utilizing only existing mechanisms, the model was displayed in April. It consists of two units—a 5 cubic foot freezer, and an electronic oven — connected by an automatic conveyor system. The latter times and transfers frozen foods into the oven in a controlled time sequence, where microwaves accomplish quick, uniform thawing and cooking, to turn out a complete dinner done to taste. Choice of meal ingredients is controlled by 14 color-keyed buttons on the "kitchen" side, matching the position of foods stored in the freezer. The 14 kinds of food that the freezer accommodates might be special gourmet dishes prepared in advance by the housewife and placed in covered Pyrex containers before freezing, or frozen foods just as they are taken out of packages, making the XPC-1 an aid to meal preparation but not a standardized punch-card device.

Where does the designer fit into Product Planning?
Product planning is a process of change—transforming new knowledge into new and usable things. The designer fits into the process because he is geared to create in the area of change. Unlike most elements of a company, he finds change acceptable and doesn't resist it—or shouldn't.
If the designer gets locked into a true planning process, he will be upgraded in the management structure from a maintenance job to a real creative one. The question is whether the designer is capable of thinking in this new dimension: if not he will become one more link in the chain, another service to be bought when needed, while others take over planning. Most designers today concentrate on styling, merchandising, selling. These are the tail of the dog; the body is planning — the real area of development that comes first.
It will require many things of designers — new work, new ideas, new needs, new mental concepts, and some new learning — if they want to be locked into the planning experience.

Richard S. Latham

Does Product Planning threaten the designer?
On the contrary, it can give him more responsibility. Whereas he was once called in after all marketing and engineering decisions had been made, he may now take part in formulating the company's product objectives from the very first business discussion. He gets the benefit of a more factual and specific problem, better defined; and if the planner recognizes that intuitive and creative powers are vital to good solutions, the designer finds himself with a bigger role in industry's future than he's ever had before.

Arthur N. BeeVar

A specialist in management problems and applied social theory explains how organization structure influences the way people produce and create, and how new management philosophies may radically influence the success of product planning efforts

BY RICHARD BECKHARD
Executive Director, Conference Counselors

WHY product planning works

The rise of product planning is not a solitary phenomenon: it is one aspect of significant and far-reaching changes that are taking place in management philosophy and practice. These changes in patterns of management are emerging as a result of extensive efforts by industrial managers and students of management to find new ways of dealing with the increasing complexities of the management job.

Our technological advances are way ahead of our organizational advances. The swift advance of technology in the last twenty years has created a need for brand new methods of solving management problems. Faced with a wholly inadequate supply of skilled and experienced managers and looking forward to a growing demand for management talent, top management must find vastly improved methods for utilizing the human resources of the management group.

In broadest terms, management's problem is to get people to put out more, and recent research suggests that the solution to this problem lies in the area of human relations. We have found that the motivation of human beings in an organization depends above all on human factors. We have found that the skills required to unleash the productive potential of the human organization are primarily human relations skills. Today this knowledge is being applied specifically to the most serious problems management faces, namely, *management succession*–the development of executive talent of adequate quality in the necessary quantity; new ways of reducing costs and increasing profits; and the creation and development of new products. These can't be solved as financial problems, or production problems, or training problems; they must be solved as *people* problems.

If we think of people as the important element in product development, we must treat the process as a planning process. The problem is to find out something about this process and how it can be improved. In the search for new ways of dealing with the new product problem, more and more managers are turning to the social sciences, where a growing body of knowledge about the behavior of human beings in organizations is being applied to the operational problem of developing a new process for planning and developing products.

The human relations theory of management, on which product planning is based, is one of two important trends by which American businessmen have been guided during this century. The other, its precursor by many years, is scientific management. Scientific management dates back to the beginning of the century, when Frederick W. Taylor and other pioneers set up systematic measures for increasing productivity through industrial engineering methods. Essentially, scientific management treats the organization as a thing, and applies machine laws to it. It tries to increase productivity through the elimination of waste–waste motion, waste manpower, waste functions or activities, and waste of time. Through the introduction of job specialization, time and motion studies, job standards, etc., the industrial engineers have made a tremendous contribution to productivity at every level of industry and have played a major role in raising America's industrial output to its present volume.

But this mechanistic approach to the management of work also developed many human problems. Job specialization might make the worker more efficient, for example, but if it made the worker feel like one undistinguished cog in a gigantic machine his efficiency might actually be lowered. As early as 1920 some businessmen and a few social scientists began to see the problems in this approach to management and set out to find new ways of increasing the productive output of work. These explorations received great impetus as a result of the now famous Hawthorne experiments conducted at the Western Electric Company at Hawthorne, New Jersey, in the late twenties. These were experiments of the sort that scientific management encouraged: they were designed to study the effects of various amounts of illumination, ventilation, etc., upon the output of the worker.

Out of numerous experiments conducted at Hawthorne over a period of years emerged the startling finding that

morale and motivation factors had a far more significant effect on productivity than the factors originally under study. For example, it was found that changes of illumination might result in gratifying production rises among a group of girls engaged in a special research room, and another group of girls appointed to an identical task in another "research room" might show about the same increase in productivity when the illumination wasn't varied at all. At length Elton Mayo and a number of other social scientists were called in. They discovered that being selected for the experiment (for example) was far more important as a variable affecting the girls' productivity than were ventilation or illumination.

Hundreds of subsequent studies have borne out this finding and a parallel one: workers at any level tend to react to heavy pressure from management by controlling their own output, usually at levels below management goals. Although the original studies were made on factory workers, the same tendency is found among high-salaried executives. Such studies have shown that if productivity is to be increased permanently, favorable attitudes toward the management and the task are required.

Findings like these have led both managers and researchers to spend vast efforts to find ways of changing the attitudes of workers and to discover the management skills that will accomplish such changes. Studies conducted by a number of universities–the University of Michigan, Harvard, Ohio State, Cornell, and Yale, to name a few–put major emphasis on the relationship between worker productivity, morale, type of supervision or leadership, and organization structure. Most of this work has been underwritten by industry, but labor and various foundations also support it. At the Institute for Social Research at the University of Michigan, Dr. Rensis Likert and his colleagues have been engaged for the past eight years in a series of studies dealing with factors that affect productivity in a complex organization. Much of this is action research, taking place in operating situations in such organizations as International Harvester, Detroit Edison, Caterpillar Tractor, Maytag Company, the C & O Railroad. Out of it have emerged a number of findings that can be applied to the problems of planning and developing new products.

How human beings work

Our knowledge of how human beings work in an organization and how they are motivated is an emerging body of knowledge that has not yet been written. We do not have the answers as yet, but we do have the directions.

A fundamental difference between the scientific approach to management and the human relations approach lies in their definition of "organization." Organization means an organization of human beings for work, and we are concerned not with the organization itself, but with the most effective use of these humans. They bear several relationships to each other. They work, they communicate and they have power over one another.

Dr. Likert and his colleagues have shown that the basic unit of an industrial organization is not an individual but a group. Although the organization chart does not usually show how people work together, the whole organization is actually made up of overlapping work groups. In looking at organizations from the point of view of their communications, authority pattern, work structure, status system, etc., a significant factor in the productivity of a work group is the degree to which its leader recognizes that he is part of such a group and that the group itself is the basic operating unit in the organization.

In situations where the leader of the group, be he president or foreman, is oblivious of the group and organizational concept, his subordinates tend to communicate upward only the information they think the boss wants to hear or that will achieve their own objectives. Furthermore, there tends to be a degree of competition between subordinates for the boss's favor. As a result the boss frequently receives inadequate information upon which to base decisions, with the result that the decisions are of a low quality, particularly as regards their implementation.

What morale means to productivity

Suppose the Vice President of Sales wants to get the first production run of a new order off the line a week ahead of schedule. He takes his case to the president, buttressed by a strong argument about the needs of the customer, relations with him, etc. The president may do one of several things. He may call the VP of Production and order him to meet the new date: the consequences of this are obvious. Or he may ask Production if the speed-up is possible. Production might tell him it can be done, at some considerable inconvenience, but that things are presently held up in Engineering. There ensues a call to Engineering, and so on. If the president calls in Production and Engineering and asks them to do this for Sales, he may create the impression that Sales is the "favorite son." Any of these results, which unfortunately occur, will tend to impede both the quality of the decision-making and the productivity of the personnel who report to the president—or foreman. The problem will not arise if the president realizes that he is not the driver of a team of horses but a member of a work group in which all members must be considered.

A related finding is that where you have low producing units, you tend to find very close and production-centered supervision–whereas high-producing units have, in statistically significant numbers, employee-centered and general supervision. This finding also holds true at all levels of an organization. In other words, where the boss puts continuous pressure on for production, there is a strong tendency for subordinates to be low-producing, dependent, waiting for specific instruction, and lacking in initiative.

There is another set of relevant findings from the Michigan research that might seem to contradict the above, although it does not. The research shows that it is possible to have high productivity with low morale under close, production-centered supervision; as long as the supervision is close enough, the productivity will stay up. But remove the supervision, and productivity nose dives. Reason: there is no motivitional force within the work group to replace the supervisory pressure. If, on the other hand, you find high

productivity and high morale, the work group can be described as having a strong will to succeed; productivity stays up because the supervision is generally supportive and there are strong morale and productivity for product planning. One might hunch that in organizations where the Research and Development or Engineering department communicated with other departments only through the president, and Production did the same, there might well be friction between the departments resulting in lower productivity in getting out new products. One might also suppose that where a design department or an outside design consultant could only communicate with Production Engineering through a joint boss, the engineers might show some resistance to the designers, and productivity might be lowered accordingly. Here is one case I observed: The president retained outside design counsel to redesign a line he felt was archaic. He so informed his engineering department and instructed it to work with the designer in getting the job done. He met with both designer and engineer a number of times to make sure they both understood what he wanted. As months went by, the president began putting pressure on the designer to get the production models completed. The designer claimed it was up to Engineering. When the president checked with Engineering, the reply was that the problem was extremely difficult and required much study and work.

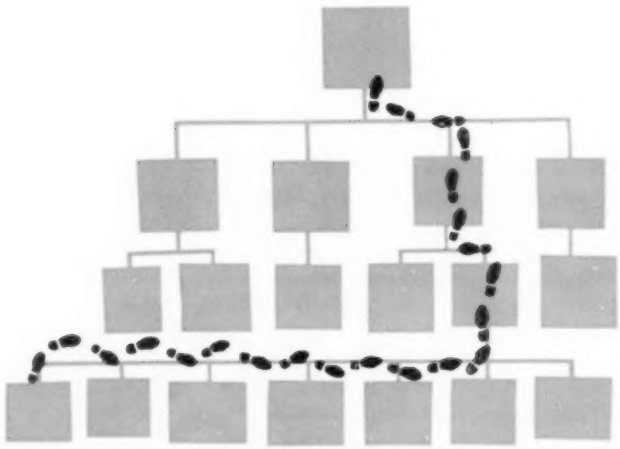
It happened that a work satisfaction study was underway in the organization at about this time. Interviewers talking to the engineers found a strong, almost violent feeling that the president was letting the company go to hell by hiring expensive design consultants to do a job that they were perfectly well able to do. The engineers felt that the only way they could prove this to the president was by putting the designers through a slowdown and by making the problem complex. Result: the company paid both the designer and the engineers; the redesigned product did not get out in time for the annual show, and the designer was fired for being unable to work with the organization. This sounds like a freak case, but I'm afraid it's not.

One obvious application of these general notions is that when new products are being planned, communication needs to be established between departments at the planning stage and maintained throughout the life of the project. Furthermore, it is not enough for the principals to be informed of what is going on; they must be *consulted*. Where outside design service is to be used it would be desirable as a minimum to have the designer sit in with the planning group periodically. Ideally, he should attend all meetings.

At this point the reader may say "This is all obvious, of course; it's how we do things." That's fine, but there are a tremendous number of situations in American industry today where things aren't being done this way.

When loyalties conflict

Researchers and perceptive management men have also discovered some things about the make-up of work groups. We have already said that the work group is the basic unit of the organization, regardless of whether or not it is recognized as such. These groups are sometimes identified as "family groups," and are composed of a superior and the subordinates reporting to him. In addition to these basic groups, which more or less represent various departments and divisions, every organization contains a number of other groups composed around such needs as interdepartmental communication, special tasks, a standing committee, and so forth. The individual members of management belong to a number of these groups, each of which has a certain degree of potency for each individual. For example, the "family group" usually has high potency for the individual member because his work destiny is to a large extent determined by the members of the group—particularly by the boss. If, as frequently happens, an individual is faced with a conflict of loyalties between a position taken by his work group and a position taken by a committee of which he is a member, he is likely to behave in accordance with the standard of the group that is more important to him. This is particularly apparent in budget meetings, where everyone representing a department tends to defend it strongly, even though the stated purpose of the meeting may well be to make the best budget decisions for the company.



An organization has communication lines

What makes a successful group

Since product planning meetings are also interdepartmental, it is natural to expect that members of product planning groups will be inhibited by a conflict of loyalties unless something is done to prevent it. In setting up product planning groups, it is wise to remember that most individuals in the organization do belong to several groups, that their behavior is in part governed by the attractiveness of each group for them in terms of how strongly they agree with the goals and task of the group; how they feel about the other members of the group; and how they feel about the leadership of the group. It is desirable to compose groups for product planning that will a) have a high degree of attractiveness for each member; b) have goals that are shared by the members; and c) have conditions where each member feels he can and is making a contribution to the group's output.

How can such groups be achieved? In operational terms, it may mean bringing into being a group of individuals representing each of the areas concerned with the entire planning process—i.e., idea producing, designing, engineering, market research, marketing, etc.—at the initiation of a planning

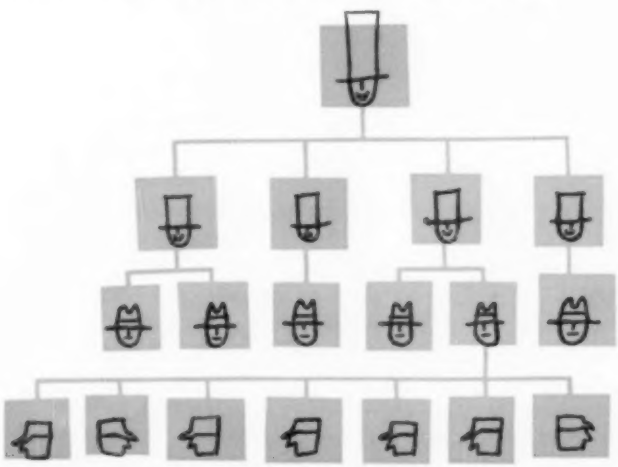
project. Then they can jointly participate in developing the goals, the task, and the operating methods, and can contribute joint ideas to the solution of the problem instead of being assigned to implement one area of someone else's decision.

Studies of group composition made by a number of researchers give us some clues as to why this kind of planning group might be the most successful. If we examine a work group in which there is an authority figure (the boss) we find that usually it has the following characteristics:

1) It is composed of like kinds of people (engineers or salesmen, etc.)
2) It has action goals (it is expected to produce results as opposed to ideas or suggestions)
3) Different individuals have different tasks (they represent departments or sections)
4) Each individual is accountable to a boss in the group
5) One individual—the boss—has power over all others.

These are all conditions that make for concerted action, high motivation to produce action, and so forth. For some tasks, a group of this sort is ideal. It does not, however, have the characteristics that produce high creativity of ideas, cross-fertilization, and courageous experimentation. Results of this sort are more likely to be found in groups whose characteristics include:

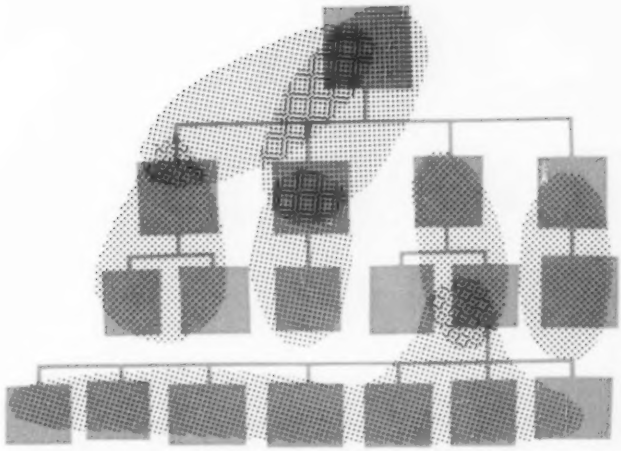
1) members from different backgrounds
2) a minimum of time pressure
3) a common group task
4) group rather than individual accountability
5) no one member with power over another member



An organization has power & prestige lines

So we find any number of companies experimenting with product planning groups or product investigating teams in which the members represent different areas of the organization, and no one is anyone else's boss.

This calculated approach to the formation of groups is related to another set of concepts about the multiple roles an individual plays in an organization. Argyris of Yale, McGregor of M.I.T., and many others have written extensively on this subject, and one of their main findings seems



An organization has shifting group roles

to be as follows: *Each individual in an industrial organization must perform a number of different roles if he is to be an effective operator.* For example, the head of the design department must be an effective boss to his subordinates, an effective subordinate to his boss, an effective client to his consultants, an effective consultant to other department heads, and a host of other things, not to mention such extra-organizational roles as family head, community citizen, etc. As one social scientist states it: "A man is judged by the number of appropriate behaviors he produces, an appropriate behavior being defined as one which produces constructive behavior in others. . . Putting it another way, every one of us in a management position must constantly make split-second decisions as to which 'hat' is appropriate for a particular situation—and woe to him who makes many wrong decisions in this area."

An interesting relationship has been found between organization role and perception. In a survey of 100 young presidents last year, Lyle Spencer at Science Research Associates discovered that a very high percentage of presidents felt they communicated their thinking and wishes on both routine and important problems extremely well to their key subordinates. Interviews with those key subordinates indicated that they felt their presidents communicated well on trivial or routine matters but were totally inadequate in communicating on the important issues.

These statistics are important because subordinates behave toward superiors on the basis of what they, the subordinates, perceive to be the facts, not what the superiors perceive to be the facts. Any person in an organization who must deal with people representing various groups will do well to find out what each of these people expect of him and how they evaluate him. Suppose a manager retains a design consultant; if his work is to be effective both he and the manager should consider these questions: How is the consultant perceived by the design engineer, the production engineer, the marketing manager, etc.? How do they expect him to behave in relation to product planning? What are the consequences if he behaves in ways they consider inappropriate? How can he find out what is considered appropriate behavior? If the designer is seen by the management group as the "president's boy" or "general manager's boy," what effect does this have on the cooperation he receives and on the actual development of products? There are many answers to these questions. The important point is that they should be considered by everyone concerned in each specific case.

It was mentioned earlier that product development is now generally recognized as a planning process. In recent years there has been a lot of study of decision making and problem-solving and the factors affecting them. The factors that facilitate and impede effective problem-solving in groups have been the subject of a number of studies by Jack Gibb at the University of Delaware. Such findings seem to have important implications for the product planning process.

Four blocks to problem-solving

One finding is that many good ideas get lost because of prejudging. We all tend to screen out many of our own ideas before we ever contribute them, and among those that do get out many die aborning because of premature judgments or evaluations by others, particularly those in power positions. Out of this unfortunate fact have grown the increasing attention to creativity and the development of such techniques as brainstorming.

Another thing that tends to hold up the problem-solving process is the failure to define problems clearly. The result may be that individuals are working on different aspects of the same problem without knowing it. This manifests itself in the well-known situation of "talking past each other." Clear definition of the problem is a prerequisite for effective problem-solving.

Creativity studies put great emphasis on the importance of fact collecting or idea producing. Action-oriented people tend to be impatient to get to solution, and this frequently abbreviates the time necessary just to produce ideas for later screening.

A fourth problem that bears mentioning concerns alternatives. Frequently when planners hit on a solution that "sounds good" they go right on down the line and initiate action on it, only to discover they have forgotten one factor that makes this solution undesirable or they have not thought of other possibilities. It is always desirable to try to develop alternative solutions before deciding on an action plan. The process of deciding among them requires planners to look at the consequences of plan A or plan B at the early planning stage.

What implications do these findings have for product planning? For one thing, they suggest the desirability of creating conditions that will ensure adequate time for planning and lack of pressure to produce. There are also implications for the composition of planning groups. In addition to combining various technical or operational backgrounds, it would seem practical to compose groups around different kinds of group membership skills. For example, the manager presumably knows which of his people are "bright idea" boys—they are necessary to such a group. You also need someone who tends to be a reality tester or a consequence tester. One or more people who tend to be supportive are also an important ingredient for such a group.

Finally, these findings suggest the importance of paying explicit attention to the *process* of planning to ensure that the critical steps are covered. If we look back over the various facets of problem-solving that have just been mentioned, we see that they comprise the scientific method: definition of the problem; collecting the necessary facts (which for product planning are likely to be scattered all over the place); idea producing; posing alternative solutions; testing the feasibility of the alternatives; and determining an action course. This has been the working method of diagnosticians, researchers, design engineers, etc., for years, but it has only recently been applied to the problem of developing products for industry.

The traditional method of developing a product was to send it from department to department until it reached production. But if the planning process has been broken into systematic steps, it seems logical for the work to go at various stages to various groups made up of appropriate people drawn from the management pool. At the problem definition phase, you might want to bring together a number of people who are connected with the project, who might be affected by it, and who would need to understand the total nature of the problem. During the fact-finding and idea-producing phase, you might want to compose entirely different groups within operating departments or, as is suggested above, through inter-departmental investigating teams. Such teams or groups could also produce possible solutions. You might want to use a policy group again to test the feasibility of the alternatives and to make the action decision. The important point is that criteria should be established as to who are the essential resources best equipped to deal with each phase of the total process.

Several general ideas emerge from all these findings.

1) Managers, designers, and engineers must be aware that planning is a process, not a technique or a gimmick. All too much planning is simply scheduling, and in the area of new product development this will not make the grade.

2) As a process, planning has certain required conditions. One is that the appropriate resources be brought together and allowed to inter-act under conditions which will ensure optimum creative thinking. This means composing groups who can work and think together under conditions different from those pertaining in day-to-day work groups.

3) Since people carry out decisions better if they have participated in making them, consideration should be given to bringing together all of those who are critically concerned with a project at certain times during the planning; throughout the process, groups should be composed around the nature of that part of the task.

4) At certain phases of the process a group together can produce ideas, under proper conditions, greater than the sum of individual ideas through the process of inter-acting.

5) The team approach should be recognized as producing a higher motivation on the part of the members to reach a common goal.

Although the findings presented here all seem to point in the directions I have indicated, the perfect answer to the process of new product planning has not yet been found. But the fact that managers, designers, and social scientists and organization consultants are pooling their resources in an all-out attempt to find the answers gives great hope for the future.

PRODUCT PLANNING IN AMERICAN BUSINESS — the end

REdesign

GERMAN JANUS SAVES SPACE WITH UNUSUAL MOTOR AND SEAT ARRANGEMENT

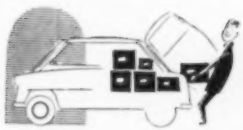
The small car to some U. S. automobile manufacturers is just a big model pared down. Europeans, pressed by the high cost of gasoline ($.90 a gallon in some countries), the frequent scarcity of metals, and a lower standard of living, are more apt to tackle its design as a unique problem in transportation demanding an original solution.

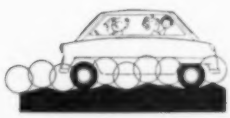
One of the newest of these ultra-economy cars is the Janus of West Germany's Zundapp Werke, with a design by Claudius Dornier, Jr. The Janus is about 9⅓ feet long, 4½ feet in width and height, weighs almost 950 pounds (compared to the Volkswagen's 13⅓ foot length, 5½ foot width, nearly 5 foot height, 1609 pounds), costs $800, and seats four adults—five on short trips. A 14-horsepower air-cooled motor with rear-wheel drive develops speeds of 50-55 miles an hour and gets close to 50 miles to the gallon.

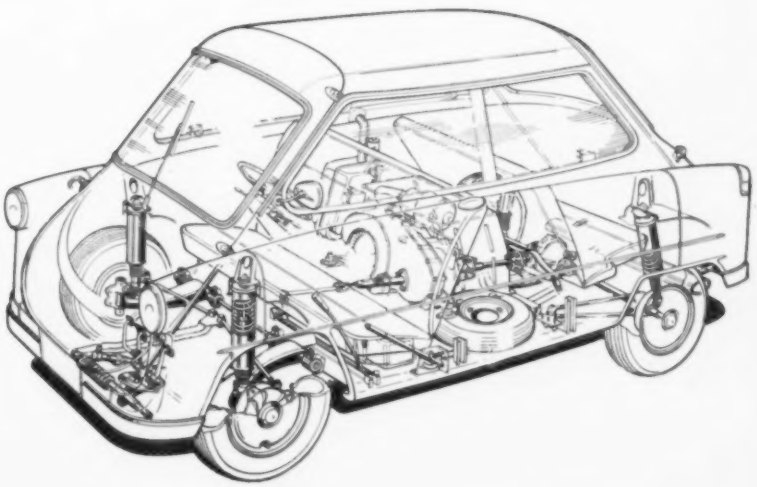
To achieve this, Dornier cut the overall space of the small car but kept it a family conveyance. He picked the cubic area spent for headroom as the place to make space cuts, but these cuts seemed impossible with the seats in conventional position. By juggling the essential masses of the interior — seats, engine, spare tire and storage compartments — Dornier got an unconventional car with back-to-back seats that require full headroom only at the center of the car. This allowed both front and back to become identical full-length doors, virtually car-width sloped down at an angle impossibly low with conventional seat placement, that takes less ducking to get in and out. (The steering wheel does not move with the front door as in the Italian Isetta.) This arrangement frees the center of the car, between the seats, for the motor and the spare tire, permitting the back seat to double as a trunk, station-wagon style. The weight of both passengers and motor is at the center of the car, distributing the load evenly for a smoother ride.

European cars often include camping aids and, in the Janus, the seats can be raised, flattened, and fixed just below window sill level to form a double bed. Raised alone, the back seat forms luggage and shelf space. Production is now limited to Germany.

Sliding windows, identical doors, uncluttered body panels, a minimum of chrome help drop fabrication costs in the Janus. Two adults, several children, or considerable luggage can fit in the back seat.





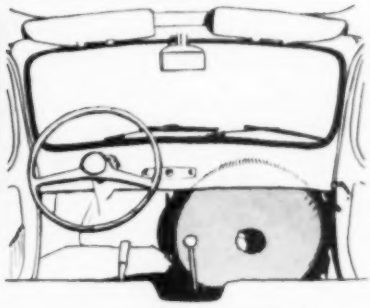


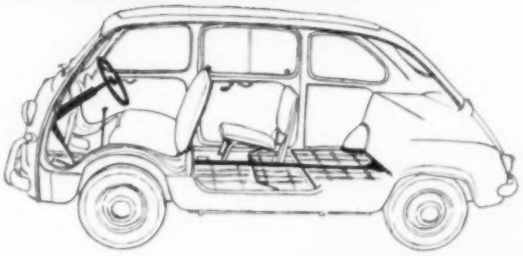
ITALY'S FIAT MULTIPLA — STATION WAGON IN SMALL CAR'S CLOTHING

To most Americans, European cars are low, rakish toys-for-grownups, so it may startle many to see the latest model in Italy's Fiat 600 line, the Multipla, looking high-slung, boxy, and station wagon-like, an outline sharply proclaiming its utilitarian role. The Multipla might well be described, in fact, as the American ranch wagon—alias station wagon, alias beach wagon—translated into terms of the European small car. The Multipla stands $62\frac{1}{2}$ inches high, measures 57 inches wide and about 140 inches from bumper to bumper. A 4-cylinder rear engine gives top speeds at full load of about 50 miles an hour—the most satisfactory cruising speed is around 40 miles an hour. The small motor runs just over 40 miles on a gallon, with as much as 50 miles to the gallon possible on long hauls with a light load. (The Volkswagen micro-buses are 165 inches long, $67\frac{3}{4}$ inches wide, $76\frac{1}{3}$ inches high, with a 4-cylinder motor that makes top speeds of about 50 at full load, getting in excess of 25 miles to the gallon.) Like any station wagon, the Multipla was designed to transport the maximum number of people and/or bulk goods for its size. (A front bench and four back jump seats can hold six adults.) The problem was to incorporate station wagon versatility into limited space. Building vertically on a typical small-car chassis, Fiat increased cubic space with a higher-than-usual headroom, which gives the car its boxy topside. A high shallow motor fits in the isosceles triangle formed by the sloping rear wall and lifts out easily for workbench repairs by do-it-yourself mechanics. This allows the front seat to be placed closer to the forward wall which holds the spare tire, and frees the largest possible area, behind it, for other seats or bulk portage. The front bench is placed directly over the wheels eliminating waste underseat space. The floor is part of the platform frame and is uninterrupted by tunnels or other obstructions. The result is a loading platform area, behind the front bench, of 19 square feet. An alternate seat arrangement puts one bench seat in the back with floor storage behind that. All seats in this model fold flat to make a double bed. The Multipla has a price of $1598.

Rear engine

Spare tire under dashboard





Back seats fold low for maximum carrying floor (middle), open individually (see right).


dip
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A REPORT BY PETER MULLER-MUNK, F., ASID

In a melange of color

and Coney-Island neon

THE HOUSEHOLD ARTS OF EUROPE

are displayed in Paris

Believe it or not, the little goggle-eyed lady on the poster, ready to mechanize her home from cellar to attic, is all that is left of our French friend, Marianne, of the fighting spirit and the always-rising soufflé. Today it is the French gals who are hypnotized by the *poulet de bresse* in the deep freeze and the electronic potato peeler.

In the days between February 28 and March 24, more than 1,500,000 men, women and children jammed into the 36,000 square meters of the Grand Palais in Paris to see the more than 1500 exhibits of the "Salon des Arts Menagers." To translate the title into "Housewares Show" would be inaccurate. Maybe "Exhibition of the Arts of the Home" would come a little closer.

For an American designer it was an unparalleled opportunity to study the standards of European household appliances and furnishings and to get a realistic idea of the changes we can expect in the French and continental economy in general. It provided an insight into the art of living in Europe which a visit to the Louvre would never have duplicated.

To begin with, the scope of the Paris show was truly enormous. Since, as its title implies, it dealt with all the arts of the home, it covered everything from wines and cheeses to modern interiors, and from vegetable and bulb growing to furnaces, appliances, cutlery, crystal and mechanical knitting machines.

Unlike our shows, which remain essentially trade exhibits, the Paris salon was open to the public. Again, unlike the Chicago show, you could buy at retail if something struck your fancy. Partly for this reason and also because of the tremendous interest in the technological miracles which promised to take drudgery out of housekeeping, the exhibition was quite simply *the* big event and the fashionable and popular topic of conversation from taxi drivers to existentialists. It was a spectacle teeming with families on their day off, sparkling animation, and manned by demonstrators who could sharpen a knife or produce a rabbit stew à la bordelaise in two minutes flat.

The French are thorough as well as frugal; and once inside the gates, they took the whole tour. To my taste, the hors d'oeuvres, sometimes quite literally, were of better quality than the main course. An investigation of the champagnes, wines, fruit and cheeses, for instance, which were displayed in tantalizing varieties on the upstairs galleries, was an experience apt to send you forth with your equilibrium more than slightly impaired.

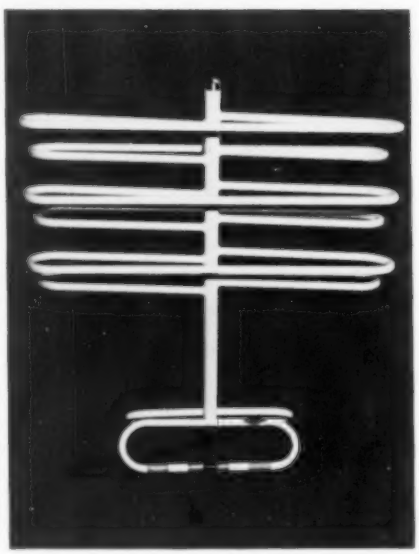
A particularly engaging section of the show was one organized by the Association of Paris Antiquarians and Decorators, divided into modern and period interiors. The theme for the period rooms was purest French: "Les belles heures de la femme"—the beautiful hours of the woman, all twenty-four of them consecutively. Each of the rooms was devoted to a specific period and to the occupation of one hour in milady's fashionable marathon. A charming idea, executed with exquisite originality, imagination and taste. Fancy finding a romantic setting, all 18th century from china

Midnight supper in the park recalled one gracious hour of 18th century living.

Midnight now means sleep on roll-away beds which stack in the morning to save space.

Inexpensive coffee grinder for two cups is carefully detailed, neat in appearance.

Sculptured fan airily encaged in wire is by Siemens, Germany.



Compact and speedy clothes drier has hot water coursing through its tubes.

and pewter to garden statuary, on the subject of "Midnight Supper in a Park" at one of our housewares shows! If the arrangement and selections for these rooms showed remarkable authority and refinement, just the opposite was true of practically all the contemporary furniture and interiors.

The House of Glass and the House of Plastics in the Grand Palais yard showed what can be done to stimulate the imagination of architects and home owners if design and technology are given a chance to work together without the often confining restriction of immediate commercial application.

One of the most charming and imaginative exhibits was one by the plant nurseries, Vilmorin-Andrieux. Within a box border, their artists had arranged vegetables and herbs of incredibly green perfection to please the eye and tantalize the palate. This was a corner of France: here was its *esprit* and its affinity for beauty in things intimate and cultivated.

The center of interest was, of course, in the main hall and adjoining buildings where, amid a Coney Island of neon and colorful displays, were to be found the major appliances and housewares. They represented the output of the most important manufacturers of France, England, Switzerland, Sweden, the Benelux countries, and of American manufacturers with European distribution.

An American was immediately struck by the number of models on display and the number of manufacturers who apparently felt that they could survive the competition for the same franc, or mark or guilder of an economy so much less affluent than our own. By a straight count, there were 42 exhibitors of refrigerators alone, 57 of ranges and 36 of water heaters. Obviously their products could not all be good or even comparable to each other, and indeed they were not. This is not to say that all the kitchen ranges, refrigerators and water heaters in Paris were shoddy. But you really had to know something about the subject and about quality control in manufacturing before you could arrive at an opinion or make a purchase with any guarantee of reliability.

Perhaps the best organized presentations in Paris were those of the major utilities and basic-material producers, such as those of the Gaz de France, the Association for the Utilization of Coal, the Associated Manufacturers of Glass and Other Materials. The competitive effort to sell primary sources of power, such as electricity, gas or coal, and the educational-promotional displays and pavilions for basic materials called

attention to the fact that the value and proper utilization of modern power sources and materials have not reached the acceptance abroad which they have here.

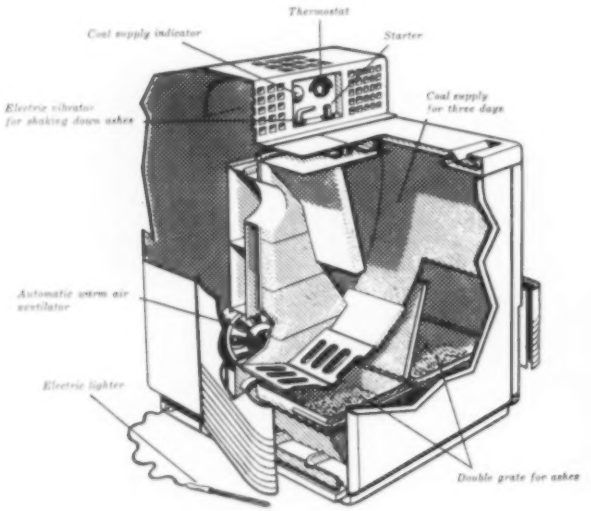
To an American, of course, the great variety of coal- or coke-fired furnaces and ranges, and of interchangeable coal, gas and electric ovens came as a surprise. The design and construction of ranges were, in general, of a quite high standard and often succeeded in coming up with simple, practical refinements in the arrangement and assembly of burners, in multiple uses of warming plates and ovens, or of economy in fuel consumption which gave evidence of the inventiveness of European engineering and manufacturing.

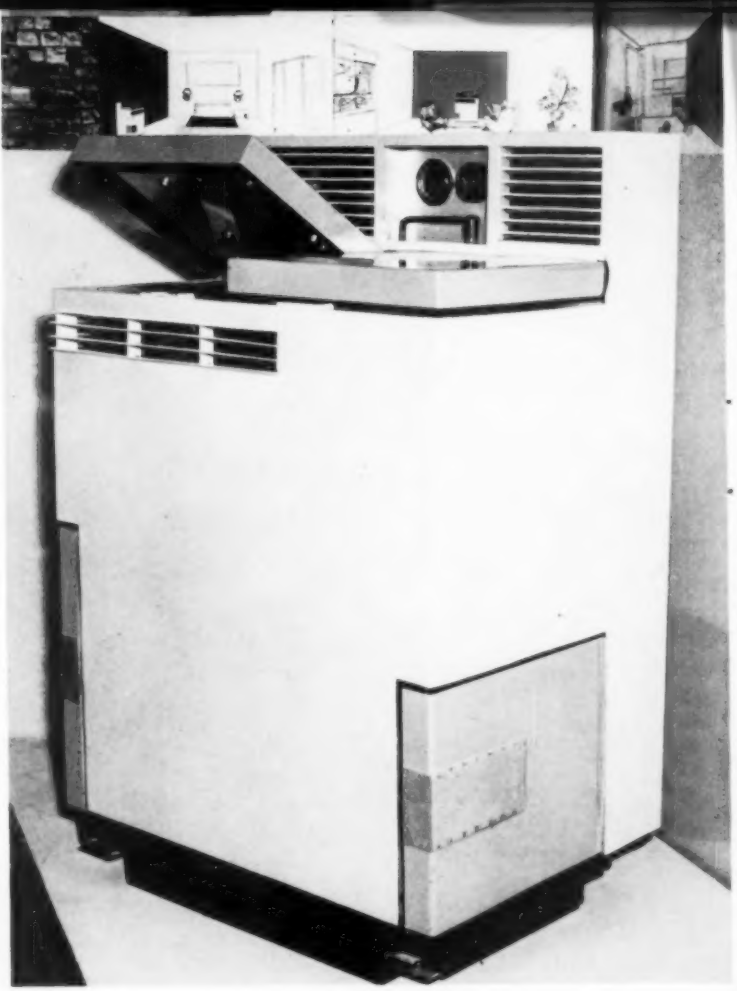
One of the most—if, in fact, not the most—brilliant products in Paris was a combination coal furnace and food warmer, engineered, designed and developed under a grant of the French Coal Institute. The result was an extremely ingenious feat of combustion engineering and of logical design by the team of Feldzer, Fenoglio, De Loose and Schein, which achieved great economy and usefulness within a straightforward and functional enclosure.

Refrigerators, on the other hand, showed little originality, apart from their incredible—to us—small sizes adapted to European food-storage needs. In many in-

Gas range of Swiss manufacture is equipped with interchangeable burners that eliminate grates and drip pans. For top-of-stove casserole cooking, longitudinal burner takes the place of two regular ones (top), is then covered by hot plate (below) for slow, even cooking or just keeping food warm.

French "dream" furnace, like our dream cars, is experimental pilot model incorporating latest in automatic features. A room size unit styled like an appliance, it is an electrically controlled coal burner which will run three days without refueling. Heat is conducted by hot air which can be controlled in direction and quantity. Designed and engineered by C. Feldzer, G. Fenoglio, H. de Looze and I. Schein, under the auspices of the French Institute of Combustibles and Energy.





stances American motifs of design were copied with little understanding for their esthetic or functional intent. In other cases, superficial tricks bearing no relation to the use of the product tried to cover up for mediocre design and performance. One example was the radio-refrigerator combination with its boast that there was nothing like it "even in America."

In the field of kitchen utensils, the Salon des Arts Menagers exhibited many clever and appealing inventions and gadgets. The humble potato and the proud asparagus were coddled with all manner of devices to strip the first and soften up the latter. Specialized vessels and skillets guaranteed the non-curdling hollandaise, the succulent pot au feu, and the fluffy omelet.

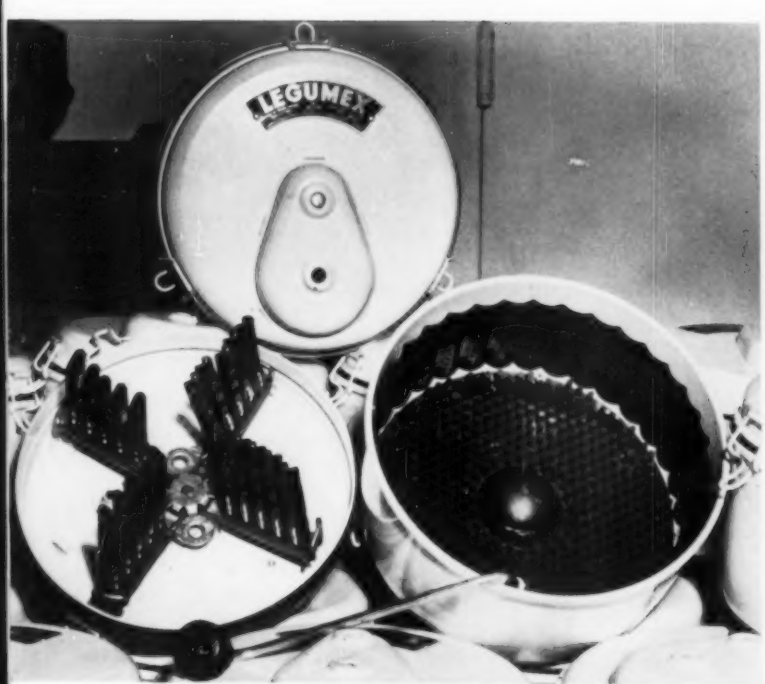
The grand-slam homerun, however, was made by Detroit. From 10 A.M. to 10 P.M., a queue four deep stretched out into the Rue Jean-Goujon, waiting their turn to get a glimpse of what was introduced here as a "Dream Kitchen." Sponsored jointly by the magazine, Paris Match and G.M., the miracle of U. S. design and engineering was accepted as an American reality. As propaganda, it was terrific; and in the country of Jules Verne, it went over like a charm.

What was the impression of the entire gigantic show from a design point of view? It is a difficult question to answer and an embarassing one. What makes it difficult is that, as an indication of industrial design, it left no impression at all. If our appliances and utensils sometimes seem overly extravagant and decorative, they nevertheless do have a certain eloquence and authority which are an expression of a specific design philosophy. This precisely was lacking in Paris. It was not so much that it was poor design but that design as a motivating influence on the product just did not exist. Here and there, to be sure, there were some encouraging islands of design recognition—the exhibit of coffee grinders, garden chairs, and storage elements by the organization Formes Nouvelles, some well-designed French water heaters and some of the German Siemens products.

Admittedly American design is not always as good as it should be. But you had to study the Paris show, as I did, to discover how far we have come in developing a truly American idiom in the architecture and appearance of our products. If Europe has succeeded in giving its own style and elegance to many of its automobiles, to much of its photographic equipment and precision instruments, it remains inarticulate when it comes to appliances and mechanical household utensils. One would think that this vacuum would act as a tremendous challenge and opportunity to European designers and manufacturers. We hope it does.

Radio-refrigerator combination by Philips is French innovation — a source of pride to its manufacturer who notes in the sign above "even America does not have one."

Poirson refrigerator (left) has hollowed-out door to accommodate handle which is equipped with locking device. Above: one of the uniquely small French refrigerators. This one by Poirson measures 25.2" high, 18.9" wide and 19.7" deep.



A peeler that can cope with a potful of vegetables, the Legumex has flexible peeling fingers in an inside lid (top right). As the handle is turned the vegetables are gently scraped by the rotating peelers, the abrasive sides and bottom.

How a half-century

corporation found

its original goal

to expand the use

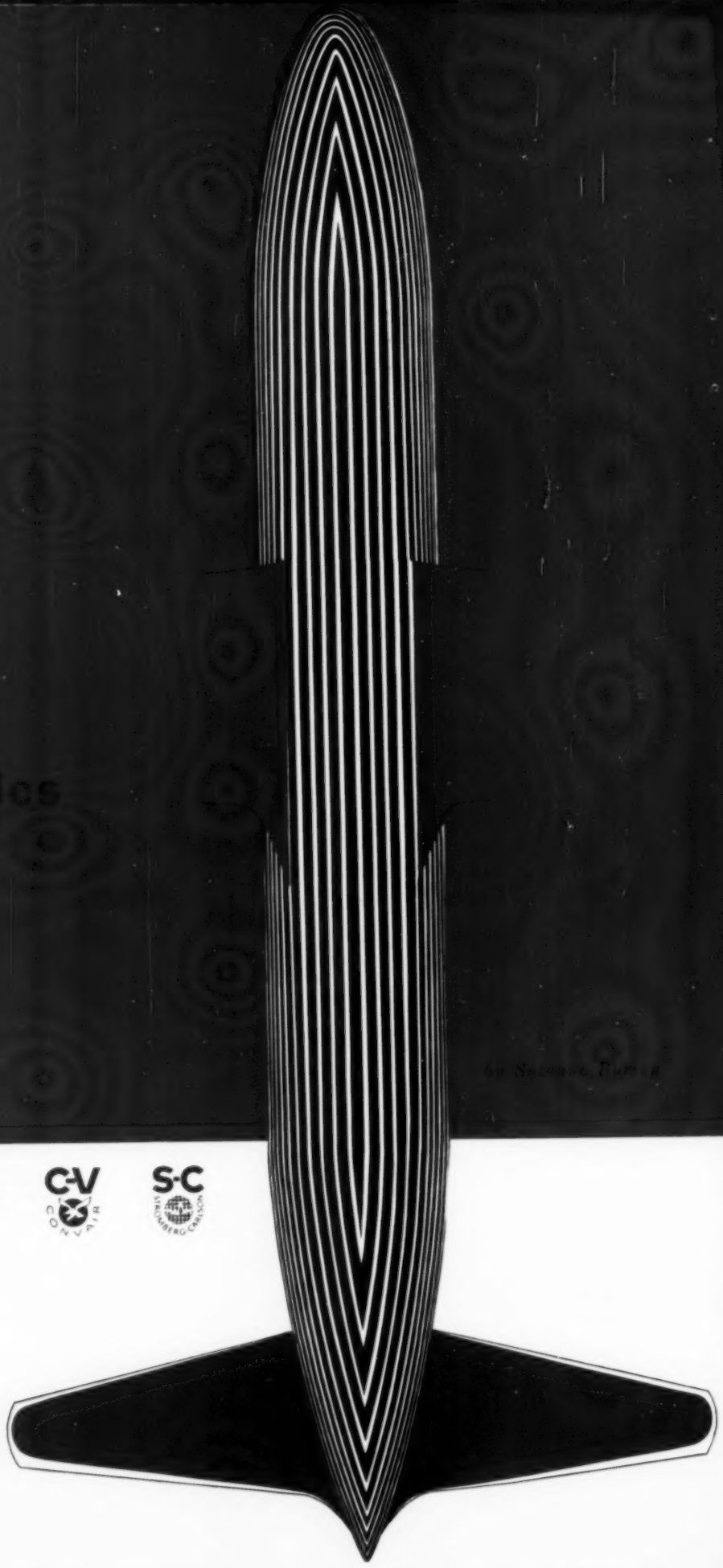
of nature's

basic forces

Graphic Dynamics

C-D

C-L EB GA ED C-V S-C



Erik Nitsche in his studio at Ridgefield, Connecticut. (Photograph by Hugh B. Johnston)

Five years ago a comet flashed into existence among American corporations, taking the name of General Dynamics. Created as the parent company of Electric Boat, of Canadair Limited, of Electro Dynamic and of an embryo called General Atomic, the new corporation grew brilliantly — adding Convair in 1954, and Stromberg Carlson in 1955, increasing momentum as it expanded sales. Gearing for both defense and civilian needs, General Dynamics realized net sales of more than a billion dollars in 1956 — six times the total of 1953. Its products are also on the march, ranging from the USS Nautilus and USS Seawolf, atomic-powered submarines, to electric motors for the SS United States and U. S. Navy submarines and destroyers, to the U. S. Air Force's B-58 supersonic jet bomber and the commercial 880 jet transport. That a common purpose (and much profit) could be found in electronics, astronautics, aerodynamics, hydrodynamics and nuclear physics is due largely to the planning and foresight of the late Board Chairman and President, John Jay Hopkins, who died last May 3. But the fact that the parent company of such cosmic energies has established the image of its dynamic self in the mind of the general public is the feat of one graphic designer. The man who, graphically speaking, proved agile enough to catch this comet is Erik Nitsche.

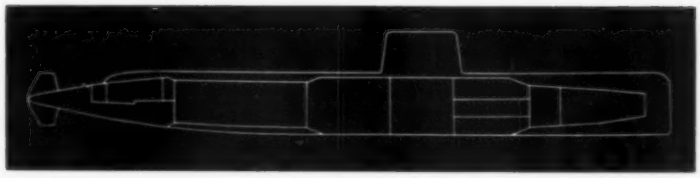
How Swiss-born Nitsche took naturally to interpreting General Dynamics — and how he gave it precisely the direction it needed in advertising and promotion — is a case of shared dynamics and of a vision that is still expanding. Most of the year, when he is not working in Lausanne and overseeing the printing there of some of General Dynamics' material, Nitsche is situated in his high-gabled studio with a rooftop bubble letting in the sky 1000 feet above sea level in Ridgefield, Connecticut. His status is independent, but in effect, as Consultant Art Director, he is totally involved in the graphic needs of General Dynamics. And as the aerodynamic look of the old farmhouse testifies, with its thrust of new terraces and cantilevered porches, the glass under the gables and the Plexiglas bubble, he is totally captivated by the horizonless adventure that the company represents. Interpreting Mr. Hopkins' concept of the enormous range of General Dynamics, of the economic and political significance of its activities, particularly in the fields of nuclear energy, Nitsche is seeking to express by visual means the benefits for mankind of scientific research.

It started mundanely enough in a Madison Avenue advertising agency in 1953. The situation was explosive. The client, General Dynamics, was working toward a fuller expression of its uniqueness, and the art director on the account, Nitsche, sensed the possibilities; both parties began to feel constrained by a conventional agency environment, by the long channels of communication from President Hopkins to advertising manager to account executive to art director and others. The advertisements and the annual report that came out at the time represent good solutions, but they only suggest on the surface the spectacular implications of General Dynamics' products — among other things, an advertisement announced that the world's first atomic-powered vessel was launched in January, 1954. Deeper recognition of the meaning of this event did not occur until a year later, after Nitsche had left the agency to work independently.

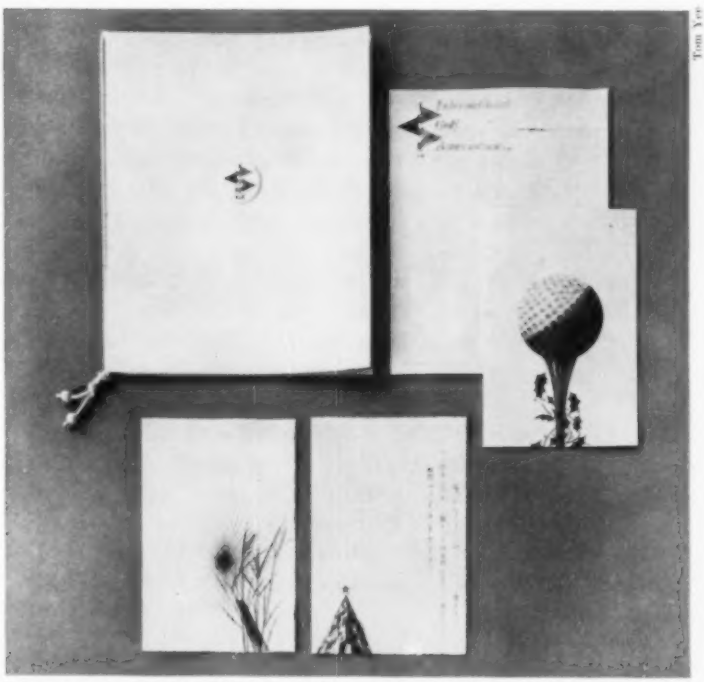
In the spring of 1955, Hopkins, with a sense of urgency, called in Erik Nitsche. The corporation was committed to exhibit at the International Conference on the Peaceful Uses of Atomic Energy, to take place in Geneva in August 1955. It needed an exhibit worthy of its leadership in atomic research, one that would stand out in the company of such long-established giants as General Electric, Union Carbide and Westinghouse, who had built the reactor to power the Nautilus. General Dynamics' problem, however, was singular. As builders of the first atomic submarine (with contracts for three more), and with high hopes of adding the first atomic-powered airplane to its achievements, the corporation had a distinct advantage — and yet, since everything about the Nautilus was secret, there was nothing to show. To be sure, within the limits of security, the company could describe its research in rocket technology, in solid-state physics and in electronics that may make space travel possible within the next fifty years, but other companies can make similar claims at this primitive stage. In the absence of actual atomic products, a symbolic expression of General Dynamics' corporate mission was needed. Mr. Hopkins' speeches and precepts, which he had delivered on an international lecture tour, about the massive power and the constructive uses of the atom provided a start in this direction, and a thoughtful content for design. But there was neither time nor budget to build elaborate models; Nitsche was asked to think of a graphic way to present an ideal — peaceful uses for the atom — and to begin designing at once.

For the challenge, as it turned out, Nitsche had excellent resources. Born in Lausanne, Switzerland, in 1908, and trained in Munich and Paris, he came to New York in 1934, where his experience spanned design, art direction and photography for a dozen or more magazines, from *Vanity Fair* to *U. S. Camera*. He designed posters for 20th-Century Fox and for the New York Transit Authority, gave Filene's its trademark, and conceived numerous advertising campaigns (Ohrbach's original full-page campaign of 1946, the famous dangling telephones talking about Sartre's *The Respectful Prostitute*), packaging, and a classical repertory of several hundred Decca record covers, each design notably related to the spirit of the music that it jacketed. In 1947-48 he was Vice President of Dorland-International, Inc., in charge of art and industrial design; in 1950, consultant to the Museum of Modern Art's Department of Design; and, through 1956, consultant to Standard Oil of New Jersey, designing books, brochures and an international advertising campaign. He knew what would appeal to European audiences who would attend the Geneva conference — posters (for Switzerland is the country of posters) in a cosmopolitan language and on an adult level. With tremendous speed, Nitsche designed the six original posters shown overleaf, and arranged to have thousands printed by R. Marsens in Lausanne, on lithographic stones, for the finest color qualities. The uniting theme of the series, printed across each poster in a different language, in English, German, Russian, French, Hindi, or Japanese, was "Atoms for Peace." The exhibition itself was simple and dramatic: the six poster designs united as a backdrop behind a model of the Nautilus' hull, and written out in six languages, the text from Isaiah 2:1 — "They shall beat

The late John Jay Hopkins

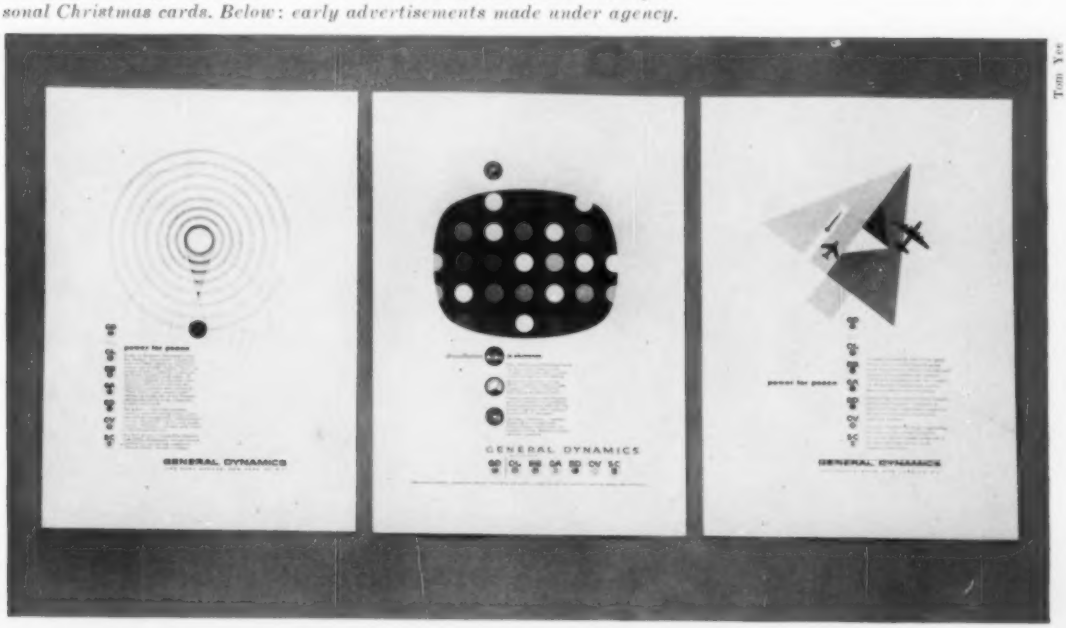


President Hopkins played a direct part in company graphics



Tom Yee

Top: drawing of Nautilus' hull. Above: for Hopkins, Nitsche designed menu, stationery, emblem for International Golf Association and personal Christmas cards. Below: early advertisements made under agency.



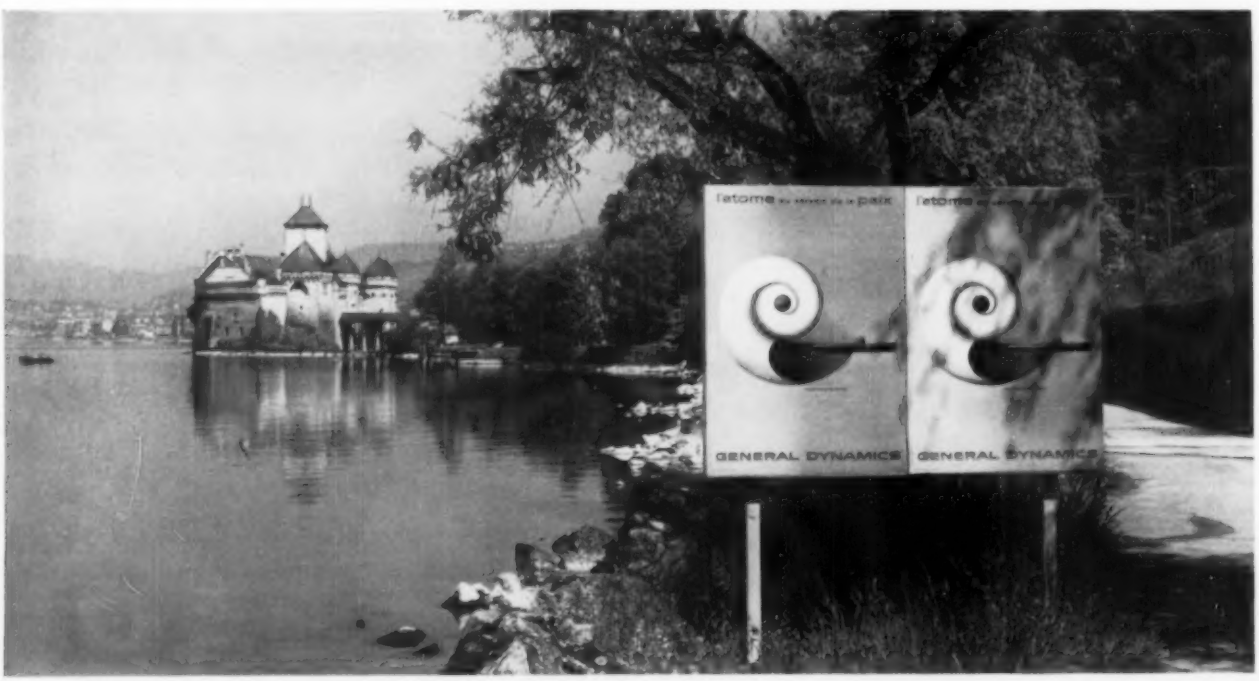
Tom Yee

their swords into plowshares, and their spears into pruning hooks: nation shall not lift up sword against nation, neither shall they learn war anymore."

At the last minute, to explain the apparent irony of featuring a warship at a conference on peaceful uses of the atom, a quotation was added from Pope Pius XII, who, in an Easter message, described the Nautilus as "the first attempt to propel a ship by means of nuclear energy — at last putting that force to the service and not to the destruction of men."

General Dynamics made an enormous impression, its bright-colored message hardly confined to the area of the United Nations conference. The posters went everywhere. Seeing them on city walls, above the vineyards of Lavaux, below the castle of Chillon, the Swiss and other Europeans took it for granted that General Dynamics was an old and familiar corporate entity, like any of the other well-known American "Generals." At the same time, the company published, in French and English, Hopkins' "Atoms for Peace" booklet, a long essay which describes his belief in "massive atomic creation rather than massive atomic destruction." He proposed that the American government undertake a 100-year atomic reactor program, planting "seed" reactors in underdeveloped areas of the world, sharing the unlimited power of the atom with all nations, particularly in Asia. The basic poster designs appear inside the book, with layout by Nitsche too, and on the cover the pyramid of flags that was the first of the poster symbols — the power of the atom. Each subsequent poster was designed to express a potential use for the benevolent atom, how it can be applied in medicine, communication, transportation and agriculture. Of these early designs, perhaps the coiled Nautilus shell, from which the submarine emerges into a green sea, became most popular.

Reproduced widely, the symbols helped to establish a new name in the array of American corporations. Hopkins conceived the idea of continuing the symbolic level of the Geneva posters in the company's national advertising program. Signing Nitsche to a contract, Hopkins established a procedure of creating advertisements within the corporation which has since then become policy. With the close collaboration of Nitsche and his own Vice President of Communication, Hopkins guided General Dynamics' advertising through a series of poster ads, marked by unusual originality and force. In 1956 Nitsche designed three more posters in the "Atoms for Peace" series — on radiation dynamics (rice on pink background), servo-dynamics (red, yellow and blue circles), solar-dynamics (parabolic mirrors). Growing out of the many conferences on the thoughts which the poster ads should express was a further clarification of General Dynamics' own sense of corporate purpose. This is borne out by the increased philosophical content of the Annual Report 1956 over that of 1955, in which Hopkins first summarizes the corporation's underlying aim: "The prof-



Among those displayed on the Swiss landscape was the Nautilus poster above.

Profiting from the fact that they are conceived as posters, whose purpose is to project strongly at a distance, the advertisements condense into images of great potency even in matchbox size (right). Because the actual source of their dynamism is Nitsche's mastery of scale within the rectangle, the designs remain powerful and effective in any size. Each one presents a single concept, expressed with a big, bold, often circular, focal point. In color there is enormous range: Nitsche is equally in control of a full burst of primaries and of subtle harmonies with few colors, favoring blue and green and a broad atmosphere of grays. With an impressive absence of stylistic mannerisms, each poster grows freshly, borrows nothing from its predecessors but fully complements them; and the recent ones show an increasing freedom and subtlety. A measure of their success as company advertising is the fact that General Dynamics has received more than 10,000 *requests for reprints.*

GD GENERAL DYNAMICS

C-L CANADAIR LIMITED

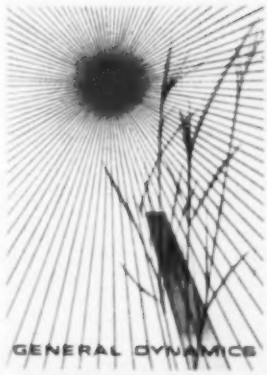
EB ELECTRIC BOAT

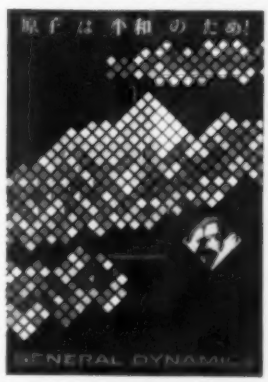
GA GENERAL ATOMIC

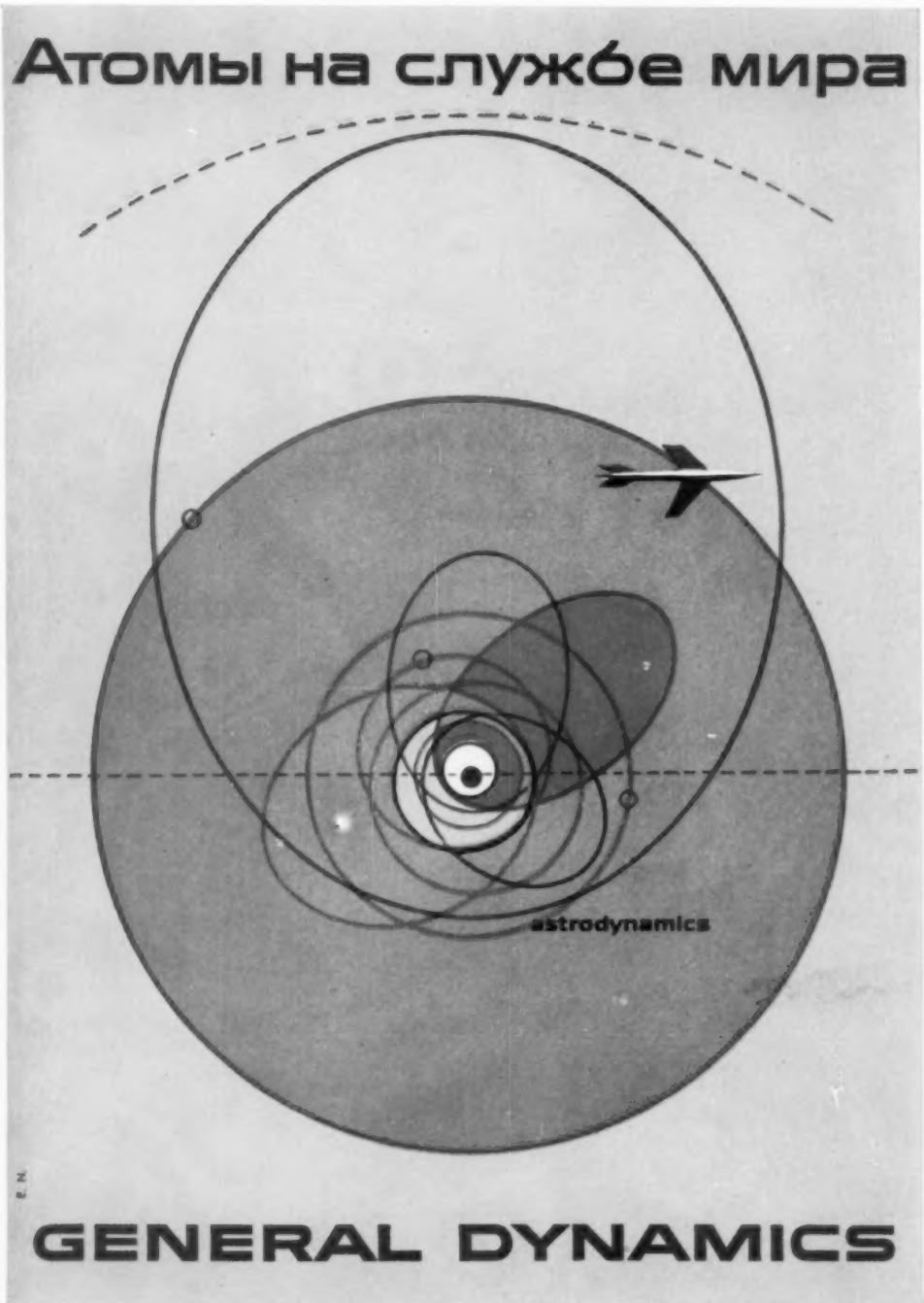
ED ELECTRO DYNAMIC

C-V CONVAIR

S-C STROMBERG-CARLSON

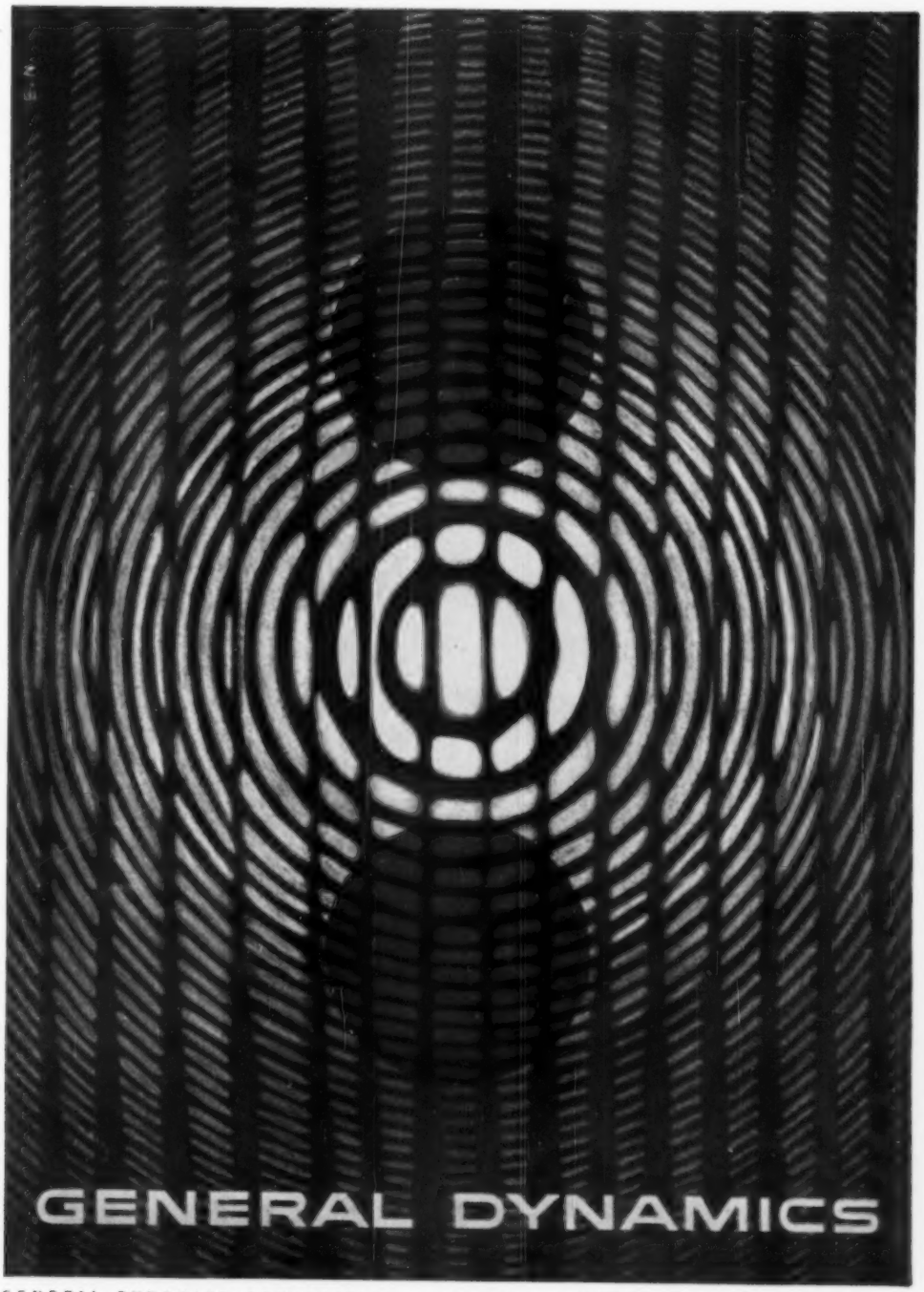






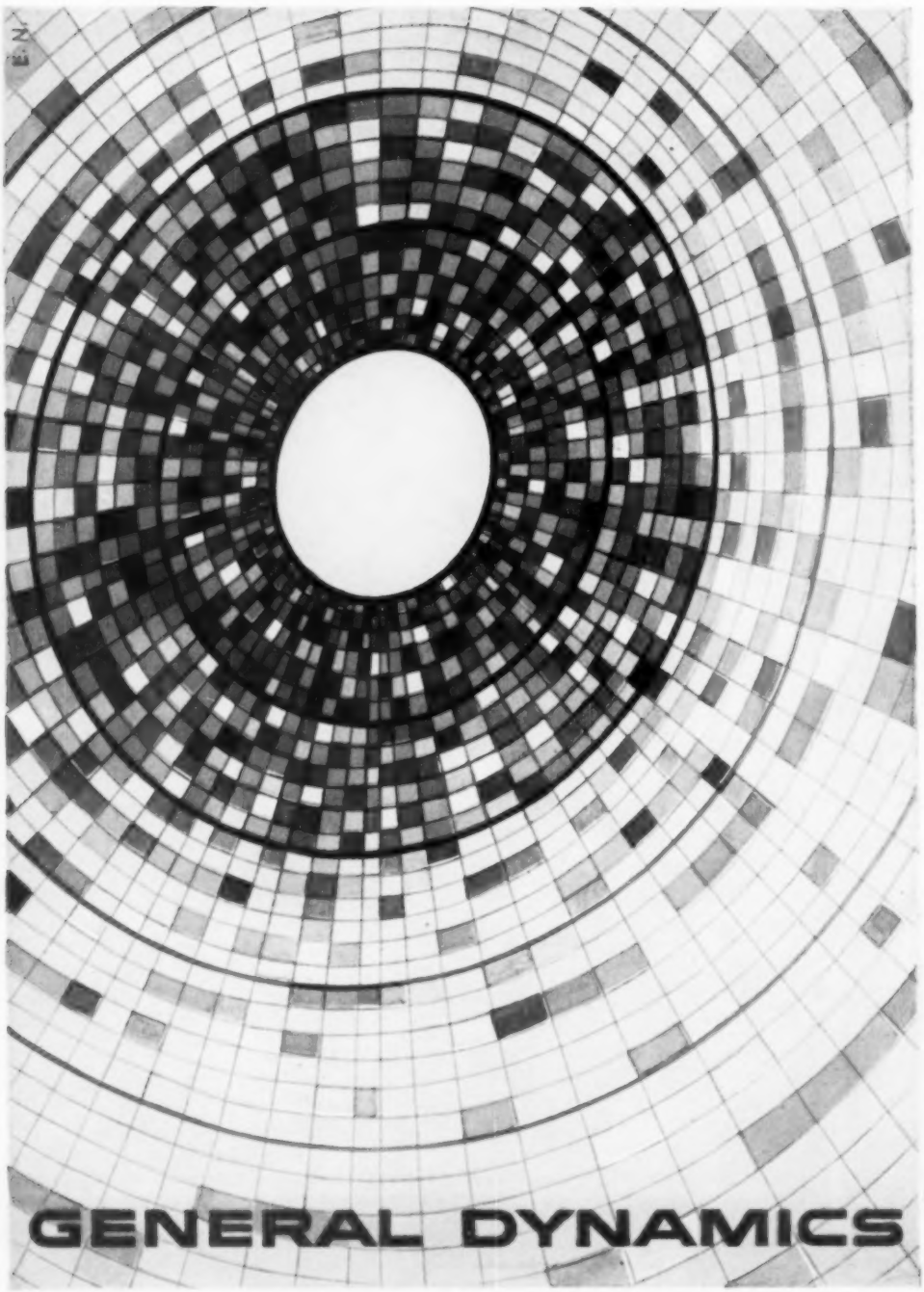
GENERAL DYNAMICS CORPORATION • 445 PARK AVENUE, NEW YORK 22, N. Y.

Third in the **"Atoms for Peace"** international poster series displayed by General Dynamics at Geneva. Man's last physical frontier is outer space. Advances in atomic technology, rocketry and electronics may make interplanetary travel a reality within the next fifty years.



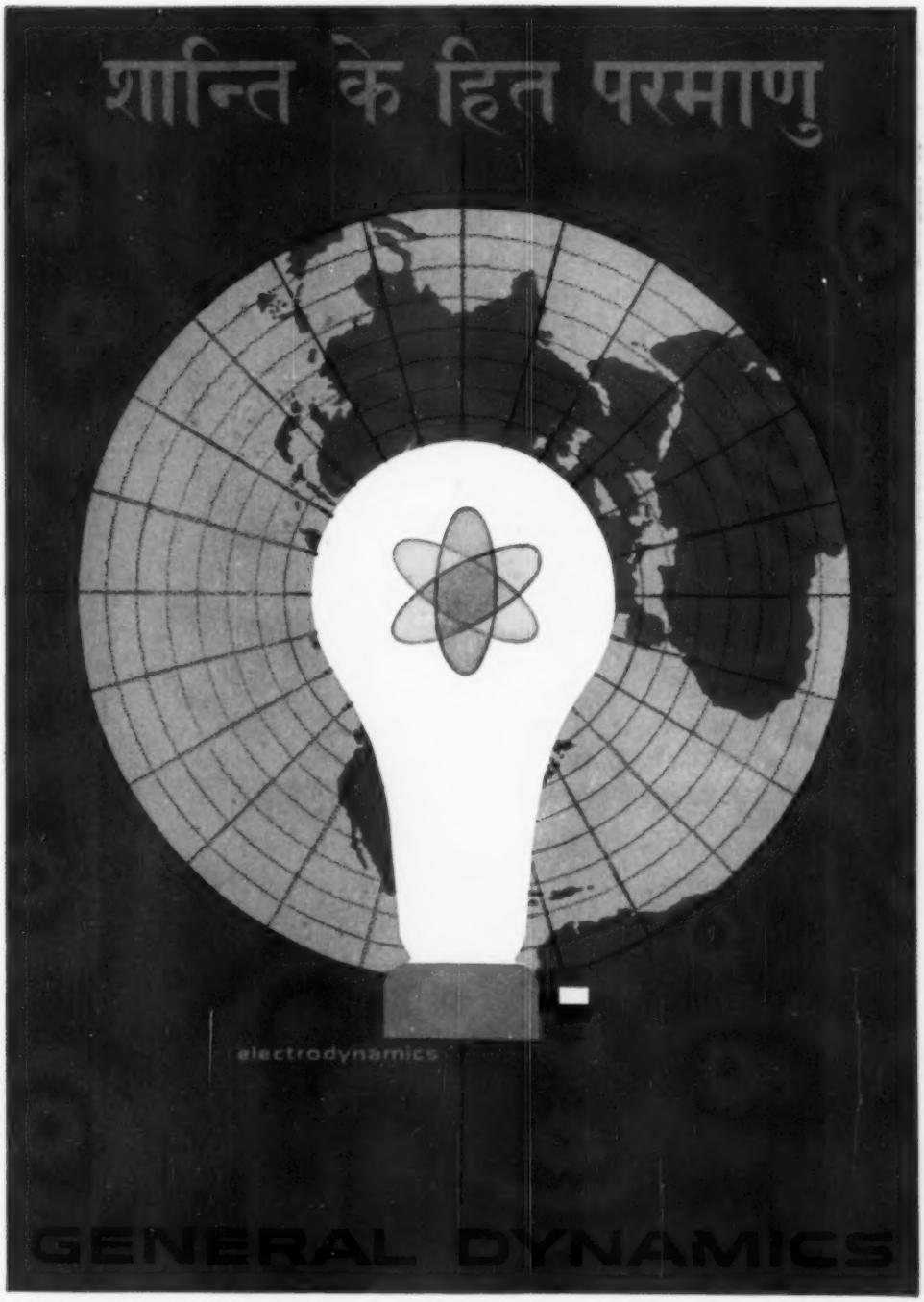
GENERAL DYNAMICS CORPORATION • 445 PARK AVENUE, NEW YORK 22, N. Y.

Power for Peace . . . New applications of the dynamics of the physical world — nuclear fission, solar energy and atomic fusion — aided by electronic automation, may bring us within our lifetimes limitless supplies of power. Consequent transformations of agriculture and industry, medicine and biology, transportation and communication, might then free all men from economic and political slavery: unite all men and all nations in an enduring peace.



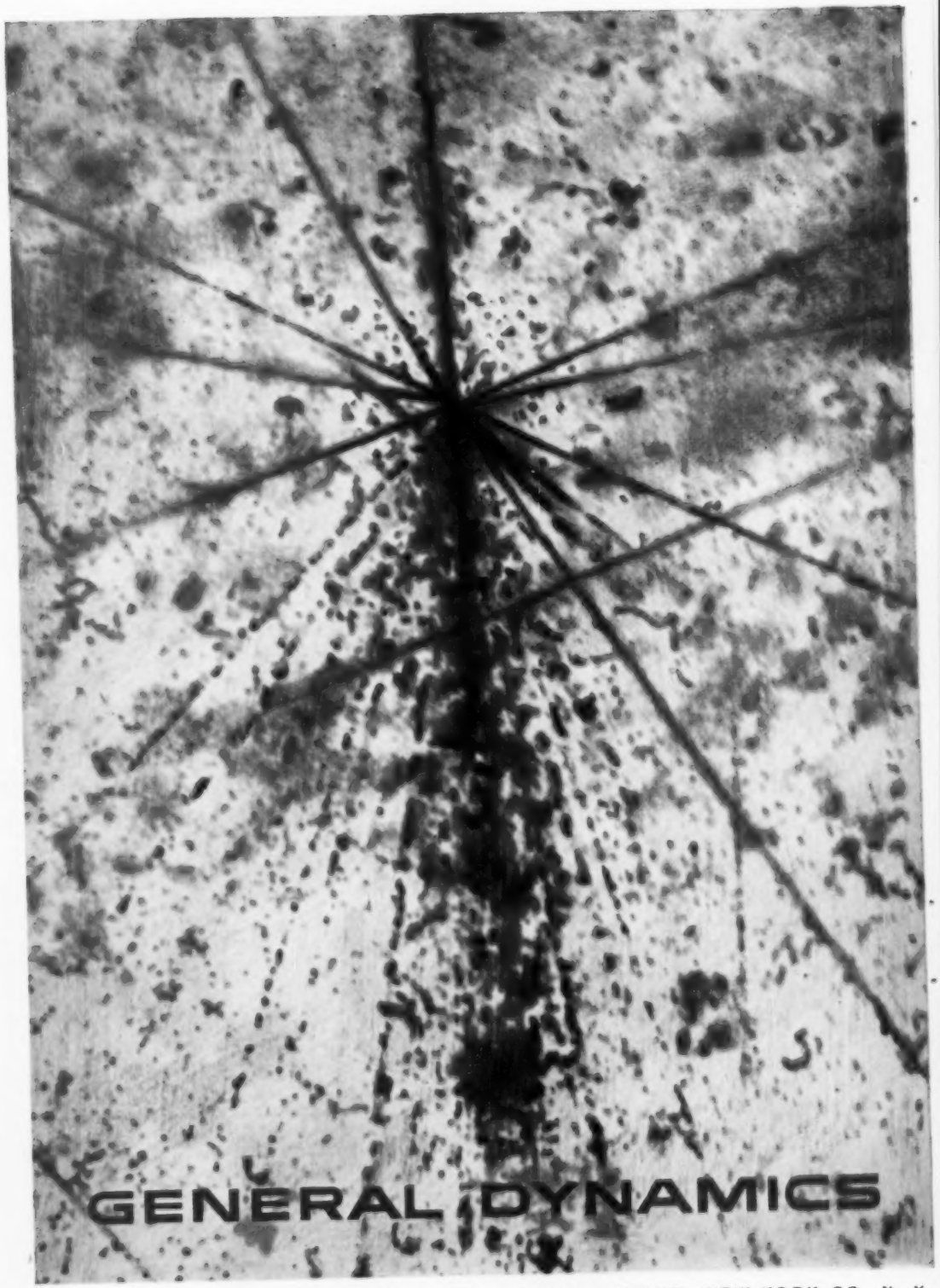
GENERAL DYNAMICS CORPORATION • 445 PARK AVENUE, NEW YORK 22, N. Y.

Power for Peace . . . To the sun's **diffuse** rays we owe our wealth and well-being. Now, scientific research focused on **controlled** solar energy may lead us, within this century: to an end of **hunger,** through commercial adaptations of photosynthesis, the process by which plants create substance out of sunlight; to an end of **thirst,** through solar distillation of fresh water from sea water; to an end of **poverty,** through direct conversion of sunlight into electricity.



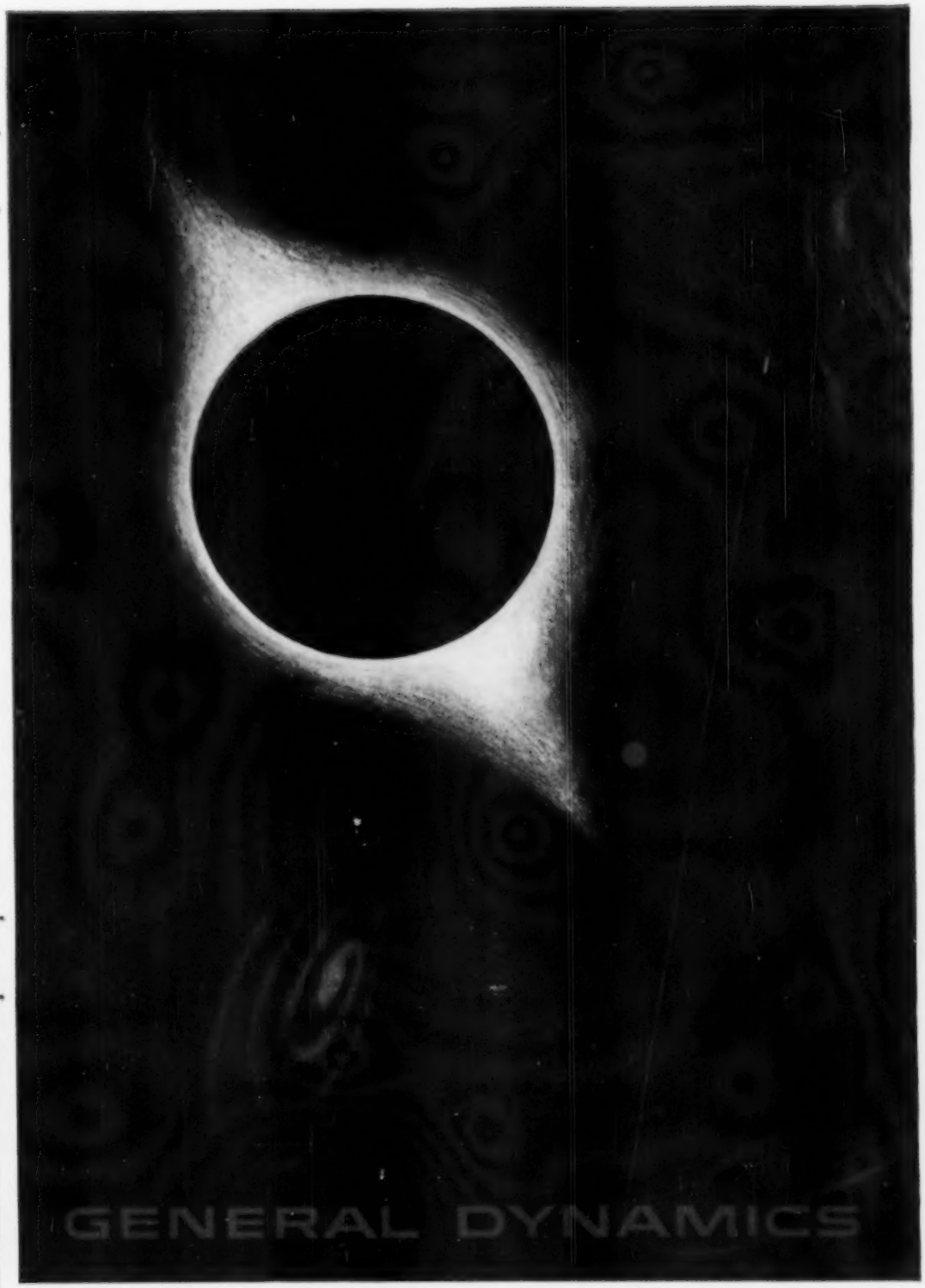
GENERAL DYNAMICS CORPORATION • 445 PARK AVENUE, NEW YORK 22, N. Y.

Fourth in the **"Atoms for Peace"** international poster series displayed by General Dynamics at Geneva. Americans, in the great tradition of free enterprise and democratic government, should grant to underdeveloped nations of the world the boon of industrial atomic power.



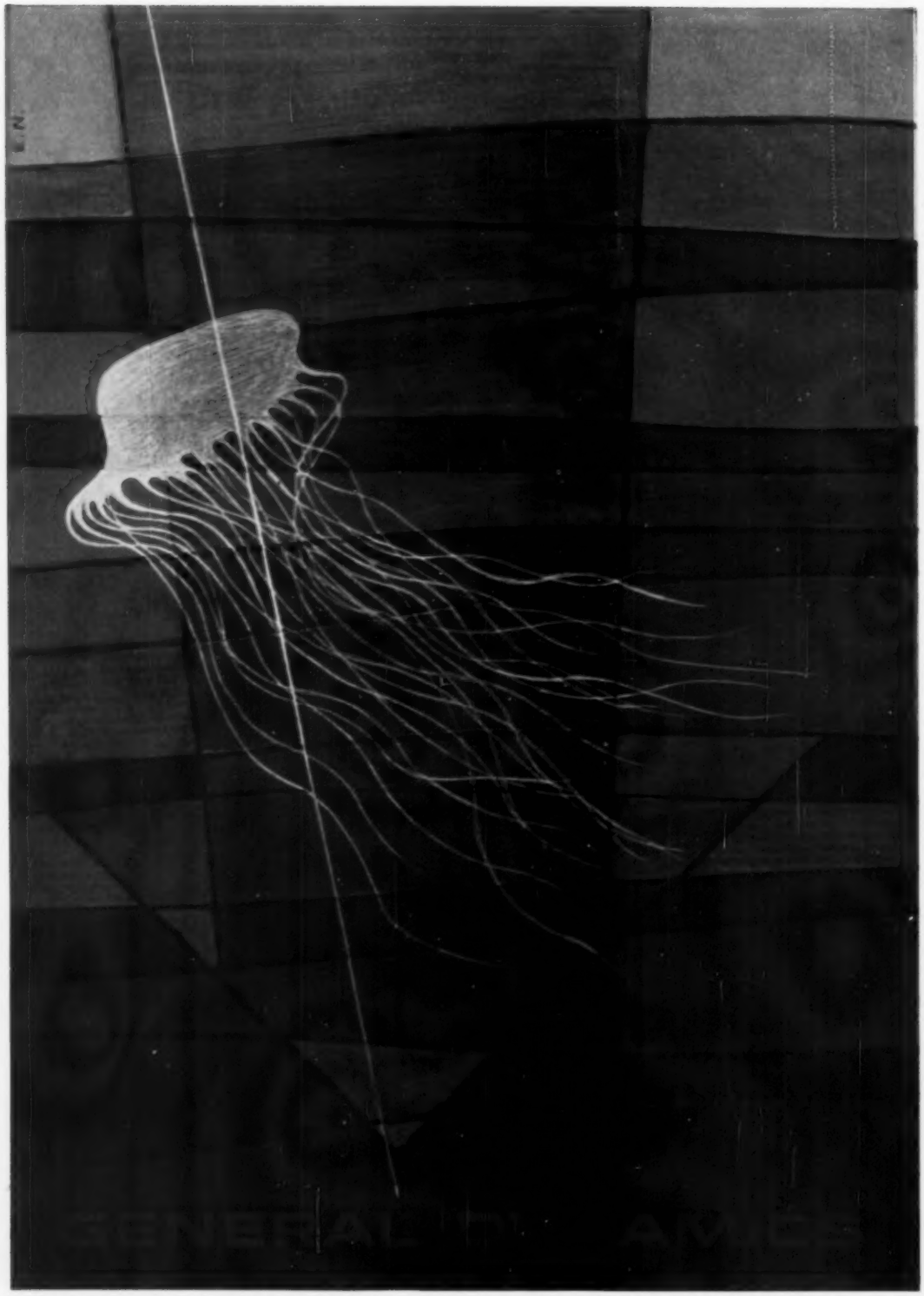
GENERAL DYNAMICS CORPORATION • 445 PARK AVENUE, NEW YORK 22, N. Y.

Exploring the Universe: Sub-Atomic Worlds. . . . To Greeks, the atom was literally "a-tomos," not to be cut. Now its very nucleus is split and scientists are tracking **sub-atomic** particles, seeking to discover the nature—order and meaning—of a vast, dynamic universe in which domestic notions of space and time and energy do not apply. **Ethical corollary:** The "finds" of nuclear exploration must be employed **not** in the service of a scientific, or economic, or political provincialism but **wherever** they are needful to the physical, mental and moral rehabilitation of men and of societies.



GENERAL DYNAMICS CORPORATION • 445 PARK AVENUE, NEW YORK 22, N. Y.

Worlds Without End: First, Earth was all. / then the Sun, and then our Galaxy / of 100,000 million suns, / "like sand . . . flung down by handfuls / and both hands at once." / Now, we know our galaxy / is but one among a billion galaxies / where suns and earths / and atoms are ceaselessly created / by a Universe without / beginning and without end. / **Political corollary:** If nations may forsake wars of aggression and deterrence / for a cooperative deployment / of earth's resources to explorations / in space and time, the new science of / astronautics may lead us soon / to the infinite plenty of the planets / and the stars.



GENERAL DYNAMICS CORPORATION • 445 PARK AVENUE, NEW YORK 22, N. Y.

The Energetic Sea: In vessels / powered by the airless "burning" / of nuclear fuels, / men may soon make voyages of discovery / to unknown continents that lie beneath / the ocean's surface; and, so, / prospect for new metals / in the waters of, / extract new minerals from / the mountains of, seek / new elements on the shelves / and beaches of, / herd new flocks to the grasses of, / draw new energies from the tides, the waves, / the atoms, of, / the energetic sea.

itable translation of the basic forces of nature into useful work under the sea, on the sea, on land, in the air, and in space beyond the earth's atmosphere."

If this is a unique concept of a corporation's reason for being, General Dynamics is a unique organization, whose business serves both military defense and the general welfare, whose considerations include the transformation of man's future environment. Feeling that this sense of unlimited potential can easily become lost under concerns of finance, military contracts and marketing, Hopkins wanted to present the corporate identity as a more profound concept, having a meaning that supersedes military stress, business competition — or even products. The current series of poster advertisements, of which two have been seen to date, is marked by a fuller realization of the inspirational role they are intended to play both within the company and outside it — and also, by a more impressive unity between the image and the poetically-cadenced copy which accompanies it — copy which originates in the office of the Vice President of Communication. This series, larger in scale, called "Exploring the Universe," began on a somber and mysterious note with the theme of continuous creation; the second example, bright and exhilarating, is called "The Energetic Sea." The title itself is evidence of an unusually fine and exact feeling for words, as is the text, ending with

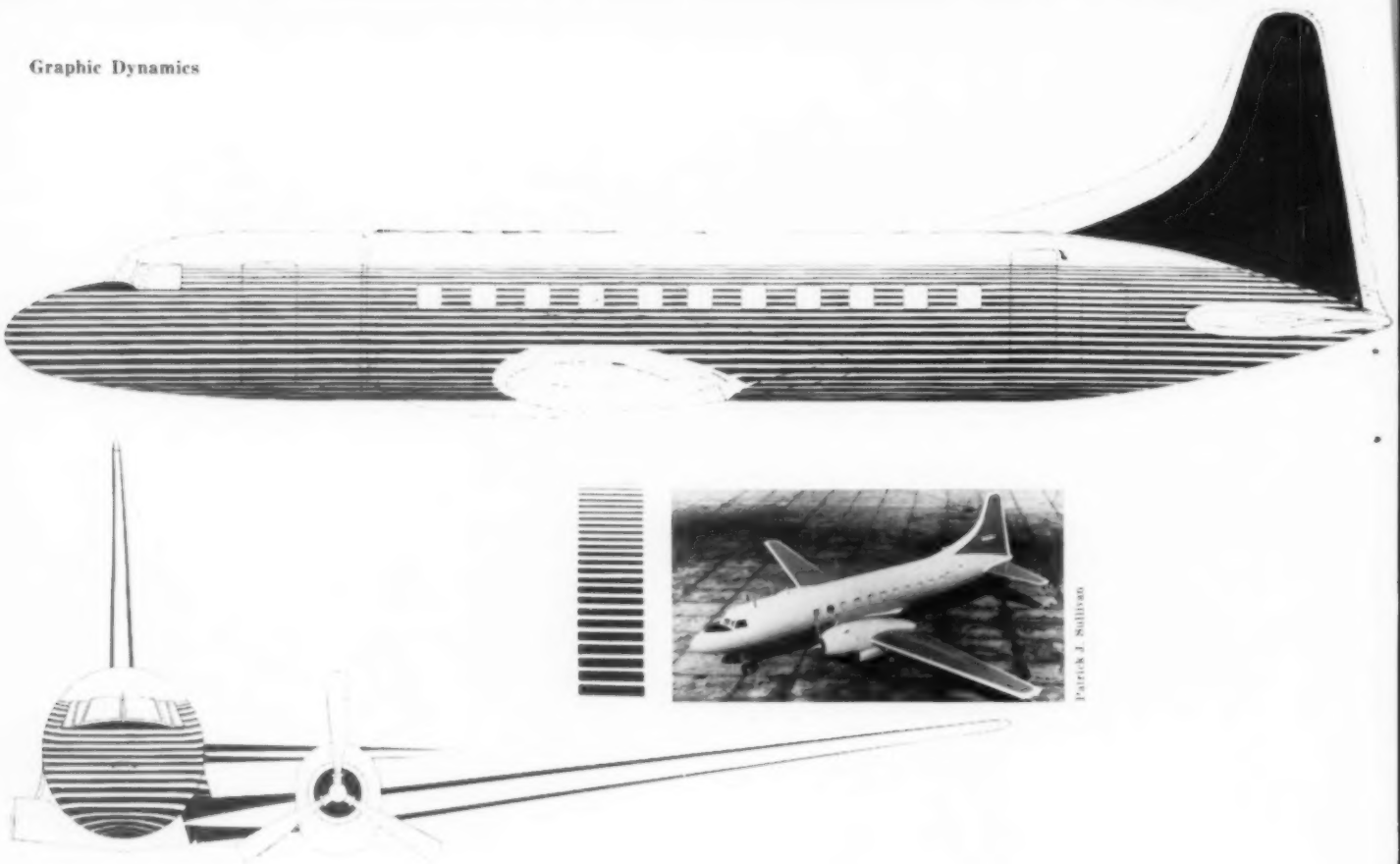
". . . herd new flocks to the grasses of,
draw new energies from the tides, the waves,
the atoms of,
the energetic sea."

While the copy for the new series of ads seeks to amplify the visual matter, the design carries the main impulse and must strike to the heart of the theme. The image, said Nitsche, must above all be clearly stated. "I do not want to be obscure. You know, one might easily get carried away by the science fiction temptation of this subject matter. What I am concerned to do is to establish it with a certain classicism. I would hate to have to apologize for a design, to have people puzzle and ask, 'What is it?' The posters should communicate with everyone. The favorable reaction of churches and schools requires that they have a solid explanation and an element of tradition."

Although he was accustomed in other years to produce designs in large volume, Nitsche finds that the Dynamics posters require intensive concentration. This factor and the weight of other assignments—annual reports, company exhibits, experimental projects—mean that there has not been a large number of posters, only 12 to date. Also, the posters are a group problem: ideas formulate during intermittent meetings and conversations with the chief policy makers, but once the con-

Top: Erik Nitsche and Roger Marsens (right) examine proof from a lithographic stone. All of the posters (above) were shown at the "Gaphic 57" exhibition, Lausanne. Among the panels presenting the "swords into plowshares" text from Isaiah at the Geneva exhibit of 1955 was the one to the right, in Japanese. Presentation of the text in five languages emphasized the international importance of its message.

斯てかれらはその劍をうちかへて鋤となし
その鎗をうちかへて鎌となし國は國にむかひて劍をあげず
戰鬪のことを再びまなばざるべし



Patrick J. Sullivan

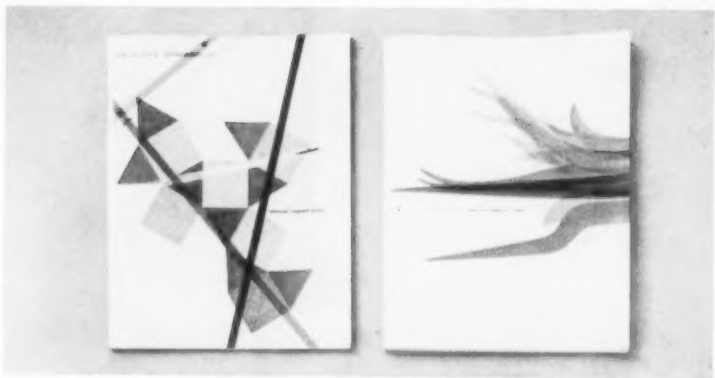
cept is decided, Nitsche is trained to visualize it very quickly and General Dynamics is accustomed to producing on narrow deadlines. As a designer, he has been called a catalyst (by P. K. Thomajan in *Graphis* '46) "who knows the alphabet of symbols from A to Z." His effort has always been to identify strongly with the needs of the client, and his affinity for General Dynamics' needs has resulted in a newly romantic and concentrated manner of expression which especially suits him — and which results in posters that have a radiant warmth. The range ahead fascinates him. "I'm working with fantasy — with an idealistic image of the future, in which we are all more or less involved."

While the primary purpose of General Dynamics' graphic program is to acquaint the general public with the spirit of discovery that motivates the corporation's diverse developments, it also provides benefits within the organization. It may have a pace-setting influence, for example, upon advertising standards of the six divisions, whose advertising programs have been (as the companies are) autonomous. Nitsche does not believe that the divisions should all have the same stamp — they do very different things — but that the parent company should be a strong leader. "We are a small mobile force, and we are available for consultation. We also try to act wherever there is a void — for instance, we recently designed a series of company flags."

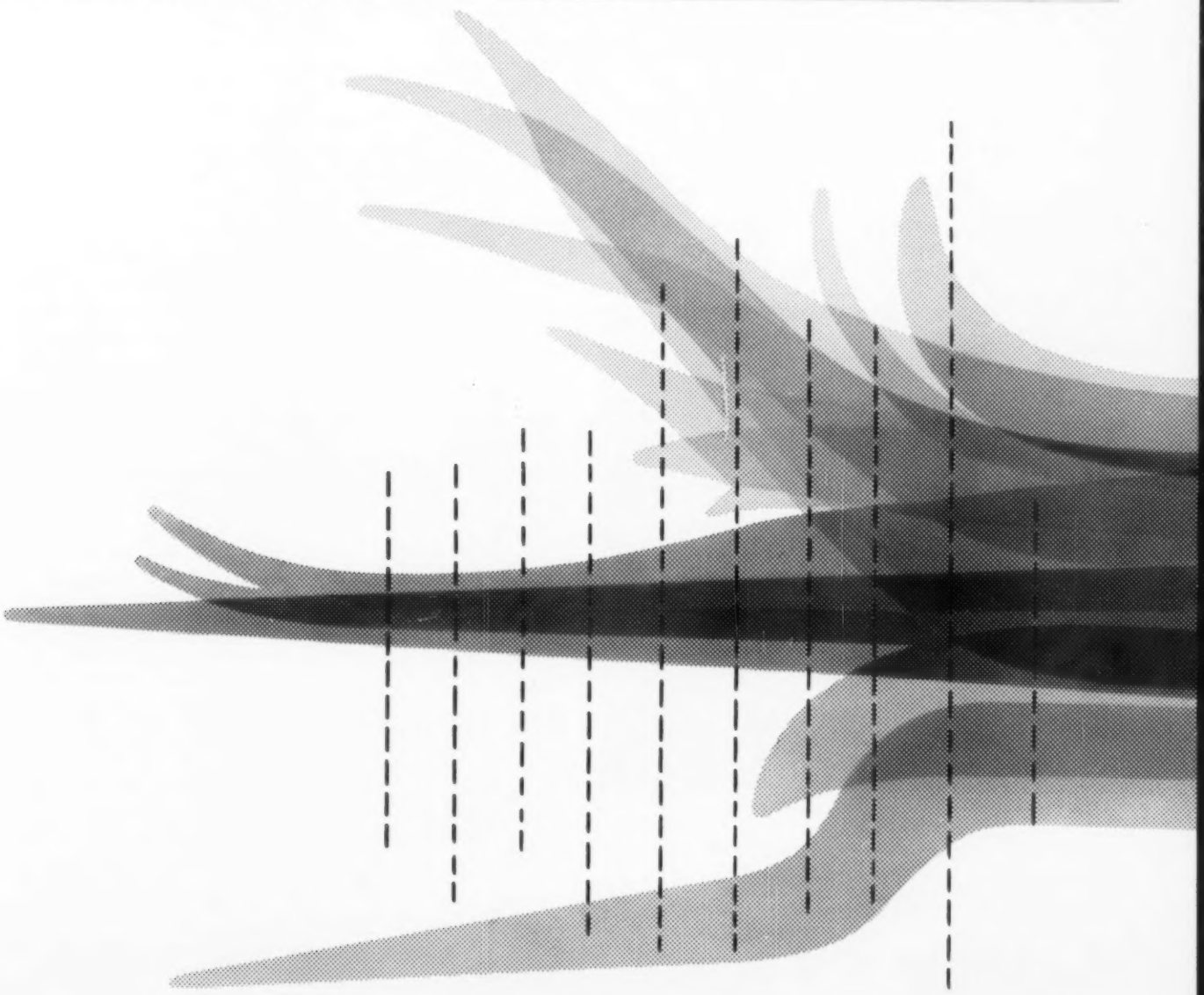
At the moment he and his staff are engaged in filling a tremendous void, condensing, in fact, an eight-year project into one. This is the two-volume company history, *Dynamic America*, planned as a predominately pictorial exposition of the military and industrial history of the nation since 1880, when Electro Dynamic, the oldest of the divisions, was founded. As a panorama of growth, it will show the parts played by the six divisions, all of which, with the exception of General Atomic, were independent companies until the last decade: how Electro Dynamic motors powered Washington, D. C.'s first trolley system; the story of the "Holland," November, 1899, which became the U. S. Navy's first submarine, whose top speed underwater was five knots; how during the same period, Stromberg-Carlson pioneered the telephone in rural areas; and on to the Air Age with Convair and Canadair, as it grew between wars; documenting construction now under way of permanent research laboratory facilities for General Atomic in San Diego.

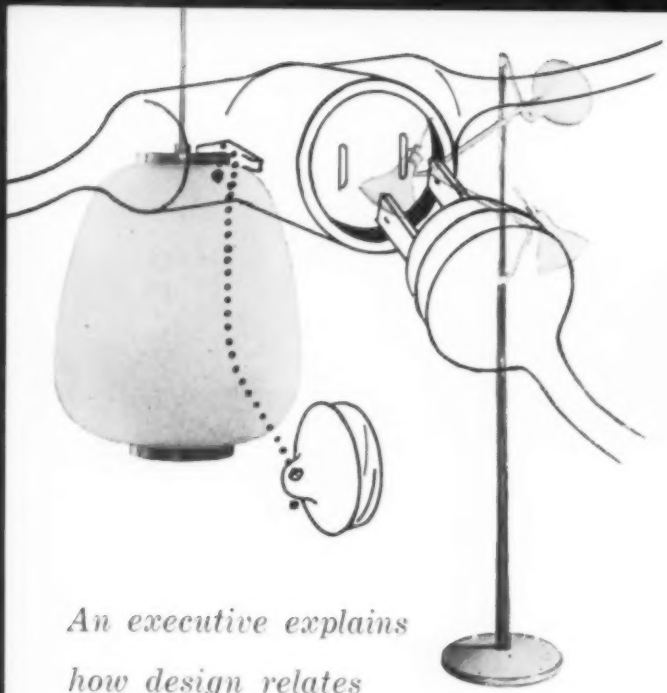
In designing and laying out this work in progress — responsible in fact for the entire visual impression of the company history — Nitsche is coordinating a highly complicated task. But his overall contribution, as it multiplies, remains essentially the same. As in the annual reports and in the advertising program, his graphic art must reveal the corporate body of General Dynamics, now with a new president, Frank Pace, Jr. — synthesizing, growing as a living organism, personal and unique.

Left: Nitsche designed the interior and the spectacular exterior of President Hopkins' private plane. The diagram hardly shows the nuances of the bands of gray, 24 shades increasing in intensity. Top of rudder, fins and wings are light blue, top of the fuselage white—the entire scheme gracefully suggests the actual effect of the play of sunlight.

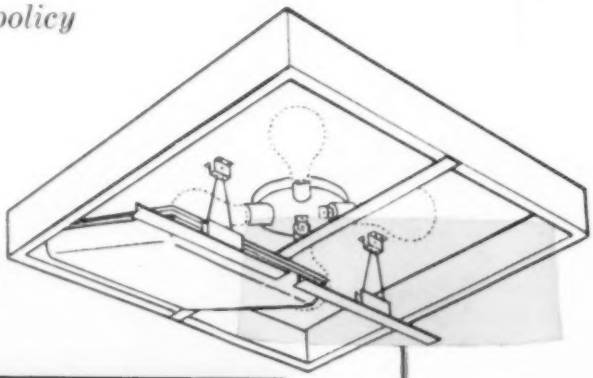


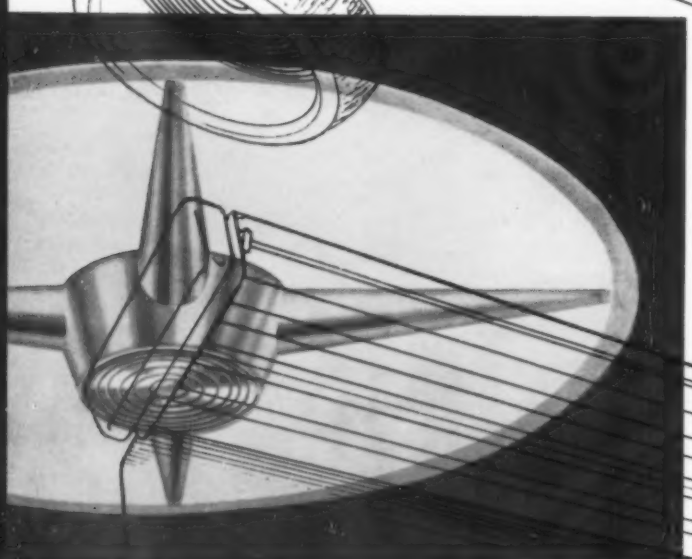
The annual report of 1956 introduced this symbol (below), representing the history of General Dynamics. Each flowing gray (seen in colors on the original chart) depicts an important event in the history of the six divisions, with the years 1880-1955 charted out as indicated by the vertical lines.

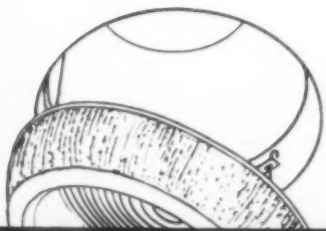




An executive explains how design relates to overall company policy







As the first installment in a series on company design departments, ID has chosen to let a company—Lightolier, Inc., a leading lamp and lighting fixture company in the U. S.—speak for itself. We present here excerpts from an interoffice memo which Vice President William F. Blitzer wrote to introduce new members of the design department to a busy, specialized and successful company. In a business where design is perhaps the chief selling point, where function and appearance are hard to separate, where engineer and designer are generally one, the design department assumes a central role parallel to merchandising, and has as close a connection to the company's management policies as can be found anywhere.

Lightolier is fundamentally a sales organization, founded and dominated by sales-oriented men. The company has survived more than 50 years in an industry marked by wide cyclical fluctuations and rapid technological progress, and has emerged a leader by offering what the market wanted.

The Design Department develops new merchandise in conjunction with the merchandise managers of each product line. It has a major part in determining product policy and making merchandising decisions. Its basic job is product development (design) while that of the Merchandising Department is market development (marketing).

The Lightolier design staff numbers 16 designers and draftsmen, five engineers and seven modelmakers. Carl Moser, Gerald Thurston and Noel Florence are the senior designers. Consultants retained by the company are Maurizio Tempestini, J. S. Hamel (lighting engineer), von der Lancken & Lundquist (product designers), and Harold Edelman (architect).

INTEROFFICE MEMO

from: *W. F. B.*

to: **Lightolier design staff**

Mushroom Lytescape for paths, driveways, and flower beds, represents a new approach to providing lighting for a growing market of middle-class home owners. Broad, shallow shade, white inside, gives wide spread of light below eye level; horizontally-mounted bulb neck is not exposed, as on standard vertical outdoor lights. Flexibility for wide range of applications is achieved by molded rubber 12' "add-a-unit" cord set; allows lighting system to be extended to seven units by tandem wiring, is made watertight by snap-on socket cover. Aluminum is used to prevent rust. Stake has integral handle, can be pushed into the ground as far as desired (usual height above ground is 24"), has welded s-shaped fin to keep it standing upright. Garden green finish, single or double mountings.

Lightolier makes and sells two basic types of lighting devices: fixtures (which are installed by electricians and permanently connected with the wiring of a building), and lamps (which have a cord and plug and are considered portable). The dual nature of our product line has led to two basically different sales channels and merchandising organizations. Besides "catalog" lamps and fixtures, the company manufactures architectural fixtures, "portfolio" fixtures and "portfolio" lamps (higher priced, larger in scale, and more suited to commercial or public interiors).

Our five product lines tend to produce cross-fertilization, resulting in a strain that is superior to any of the original species. Examples of this influence are:

1) The stimulus to designers which arises in contract or job selling where they are confronted with the problem of designing for end use.

2) The filtering down of engineering principles from architectural lighting to home lighting.

3) The large volume of multi-purpose parts in a wide range of lighting devices.

4) The impact of a "one-stop shopping" service whereby consumers or architects can satisfy almost all their needs at one source.

5) The carry-over of brand name identification.

Our product policy might be summarized as follows:

1) *Maintain design leadership.* Establish styles and trends, don't follow them.

2) *Design the selling story into the product.* Sometimes there is no selling story except "it's new and it's beautiful," but this is not how PBS (proven best sellers) are born. Design means giving form to an idea.

3) *Design for the massive middle millions.* The numbers of the very rich and very poor are decreasing, while the middle income group has expanded markedly.

4) *Design multi-purpose items out of multi-purpose parts.* Look for "basic common denominators."

5) *Offer a maximum of choice with a minimum of variety.* Cover the greatest range of customer demand with the shortest possible line.

Reading lamp illustrates Lightolier's "end-use" design objective: parabolic shade distributes three-level light evenly; polystyrene louvered diffuser concentrates light within cut-off angle of louvers, filters direct and reflected glare (especially reflected light from shiny surfaces). Floor lamp below telescopes up and down 15", tilts and turns in any direction. Tray accessory can be attached at any height, rotates on pivot arm, has recessed, removable tarnish-proof ash tray. A variety of finishes is offered, with brass accents confined to conspicuous connecting points. Same shade and diffuser are used in a wall-mounted, cord-hung lamp and in a desk lamp.

6) Use the architect, engineer, decorator, builder, and consumer contacts of our various sales channels as a means of *designing for end use.* Design in the next larger frame of reference; consider the "go with."
7) *Use research, not rehash, to further understanding of existing lighting needs and new applications.*

Designing for utility: effects of lighting

There is no sight without light. The basic purpose of lighting devices, as we know, is to assist vision. Their "utility," however, is not limited to making things visible, but includes a number of other factors:
a) *Safety.* We need light to see obstacles, moving objects, steps, etc.
b) *Health.* We need proper visual conditions to protect the eyes. Eye strain can lead ultimately not only to defective vision but to other physical effects such as nervous strain and poor posture. Lighting devices should provide not only an ample quantity of light but a good quality of light. The latter is chiefly a matter of brightness control (elimination of direct and reflected glare), and is achieved through the use of diffusers, lenses, louvers, baffles or reflectors.
c) *Efficiency.* It has been proved many times that the efficiency with which a person performs a task can be measurably improved by providing good lighting conditions. This, again, is a matter not only of quantity but of quality of illumination.
d) *Flexibility.* The advent of open planning in interiors has led to the prevalence of multi-purpose areas. Whereas homes used to be built with a parlor, living room, dining room, and perhaps a study or music room, now these are frequently combined into one living area which houses such activities as eating, conversing, TV viewing, listening to music, playing cards, and reading. To serve such a multi-purpose area, we need multi-purpose lighting. This can be achieved in three ways: flexibility of intensity, through the use of three-way bulbs or three-bulb clusters controlled by three-way switches, dimmer controls or adjustable shades; flexibility of position, through the use of reels, tracks, swivels, swing arms, telescoping tubes or pantograph linkages; and flexibility of direction, through the use of swivels, adjustable reflectors or baffles. This range of flexibility has many important purposes: it permits regulating the light to suit an individual's particular eye needs; it enables one lamp to function properly in various settings and with variable heights of furniture; it enables one fixture to fit several installation conditions; e.g., sloping ceilings, as well as level ceilings.

e) *Psychological-emotional factors.* Light has a great power to affect our perceptions and moods. Lighting can make a room seem large or small, bright or dismal, formal or informal, restful or exciting, theatrical or businesslike. It can make a surface flat or bring out its texture, hide the defects or bring out the appeal of a piece of furniture, make a face look harsh or friendly. This aspect of lighting design remains an art. Much remains to be learned about the psychological "utility" of lighting devices, and it is the subject of basic research being sponsored by Lightolier at Cornell.

"Spot" light is an example of quality manufacturing for a sturdy lamp. Precision tooling of shade allows substantial wall thickness (⅛"), quality feel, rigid shape. Difficult curve in metal was created to provide extension in front to shield the bulb. Concentric ring louver is held by molded-in internal bosses. Lower inside rim is left natural black to kill glare. Precision molding was further utilized to provide cooling slots without entailing expensive retractible dies. Switch is integral with the top of the shade, and provides large, easy-to-grip knob within the organic form of the shade. No extra switch elements are required for wall mounting—an added standardization. Wall-mounted and tree lamps swivel in all directions for indirect or accent lighting, are made in single and multiple mountings, some with direction adjustment handles.

Designing for maintenance: durability and servicing

When we deal with lighting devices, maintenance has several important aspects. First, we are concerned with the life of the fixture or the lamp itself, of the bulbs and tubes which produce the light, and of the auxiliary equipment (such as ballasts) which is incorporated into the fixture. Secondly, in the interests of efficiency, we want to keep reflecting and transmitting surfaces clean. Thirdly, we want to keep a lamp or fixture clean just for reasons of appearance. Lastly, and perhaps most important, we must relamp lighting devices periodically. If this servicing operation can be simplified and expedited, much is gained in the long run.

The following are some of the factors to be considered in designing for easy maintenance:

a) *Rugged construction.* Commercial and institutional installations demand much more in this respect than do residential applications.

b) *Sound choice of materials and finishes.* (See page 96(a), on manufacturing flexibility.)

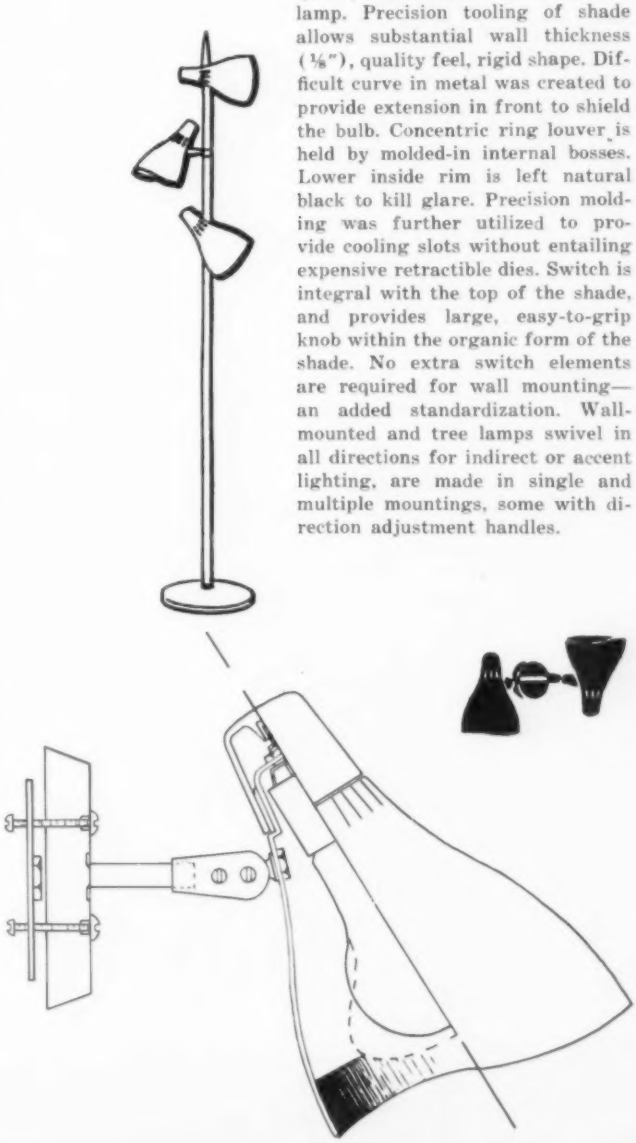
c) *Control of thermal factors,* such as conductivity for heat dissipation and convection for cooling and carrying away dust-laden air.

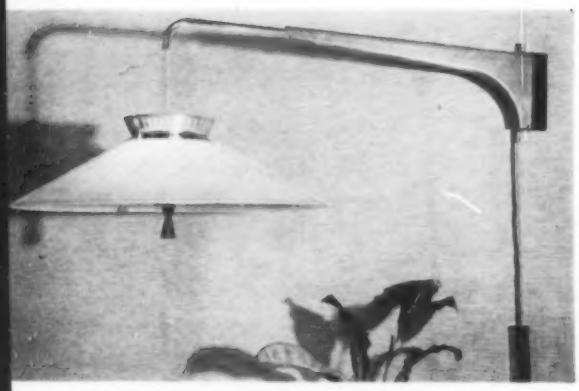
d) *Simple lines and easy-to-clean surfaces.*

e) *Simplified relamping.* Eliminate the need for tools; provide safety hinges or other means of suspension for diffusers.

f) *Compensating adjustments in movable devices.*

g) *Anti-static or destaticized materials.*





Wall lamp uses a wide range of materials for solutions to special problems. Shade is imported grass-cloth laminated to spun glass; it is dielectrically welded to vinyl-coated steel wire frame to make a permanent lip that withstands heat, moisture, handling. Perforated aluminum crown is coated with clear brass-colored baked synthetic lacquer. Molded phenolic switch knob, brass telescoping tube, walnut arm, and steel counter-weight were selected with reference to heat and touch. Cord is cotton-covered for easy sliding. Wide variety of combinations and applications includes several mountings: tracks, cord reels, tube arms, ceiling mounts.

Cost: manufacturing and distributing

The ultimate cost of a product to the consumer is made up of several costs, all of which the designer must consider. He will naturally be concerned with manufacturing costs, but unless he also thinks of the cost of getting the product to the consumer, and the cost of its use by the consumer, his job is not complete.

a) We try to maintain *manufacturing flexibility by means of extensive subcontracting.* In a field marked by constantly changing style preferences, light-source technology and manufacturing know-how, we are thus free to choose the best material and the best method for each application. The designer must keep this freedom of choice in mind and should not permit his attention to be confined to a single material or method at too early a stage in the design process.

b) We try to design around a process involving *substantial investment in tools,* if this is feasible and if cost studies show that the economies of low unit cost offset the high tooling cost. Expensive tooling is good protection against imitation by our competitors.

f) *Try to put the cost where you can see it.* Many details are thoughtlessly designed which add far more to cost than to utility or sales appeal.

g) *Design with stock sizes of raw materials in mind.* In this way we can avoid costly specials and waste.

Not only the cost of making, but also the cost of distributing, our products must be considered:

a) Design so that, by means of interchangeable, multipurpose items, the distributor can obtain *maximum variety from a minimum of stock.* However, we must not go too far in this direction because of the distributor's reluctance to handle parts rather than fixtures. It is a matter of compromising.

b) *Design for minimum bulk.* This often means that the product is knocked down when packaged. We can only go so far in this direction, too, without making the installation burdensome to the contractor.

c) *Design the packaging for ease of handling and identification,* through careful attention to labeling.

c) *Designing around standard parts* enables us to achieve many of the economies of mass production even though the unit sales of any one item in our line rarely justifies such techniques.

d) In order to avoid the hidden costs of handling, scheduling, etc., we design for a *minimum of parts.*

e) Another important principle is to design so as to *minimize the space-time consumed by a product during its manufacture.* We strive to keep each item in a condition of minimum bulk until the last possible moment. This includes such considerations as designing for nesting parts, riveting or bolting *after* finishing rather than welding *before,* and shipping knocked-down.

Cost: installation and operation

The following goals must be considered, in designing lamps as well as fixtures:

a) *Design for ease of unpacking.* This seemingly unimportant consideration can be a major factor in the installation cost of a large commercial job.

b) *Design for minimum on-the-job assembly.* We try to deliver a fixture, not a collection of parts.

c) If some on-the-job assembly is required (it usually is), *try to reduce the number of loose parts* by using snap-fasteners, captive screws, bayonet holes, etc.

d) *Strive for clarity of construction.* Dependence on an instruction sheet is a measure of defeat. It slows up the job and frequently is not read.

e) *Supply all the necessary parts, holes, knock-outs, to take care of any reasonably likely job condition.*

These points must be kept in mind in order to lower the cost of *using* our products:

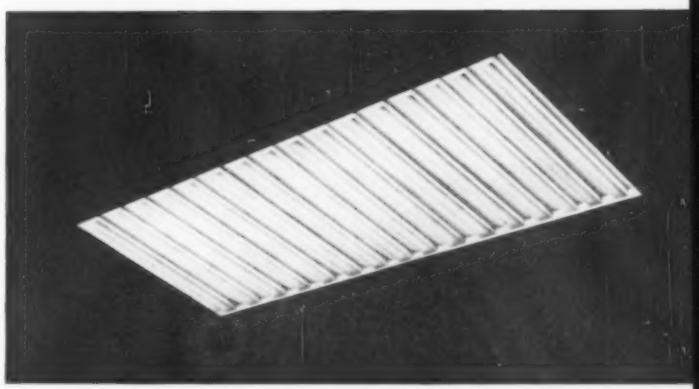
a) The efficiency of a lighting device (or, more properly, its coefficient of utilization) is a key to how many units—and how much electrical energy—will be required to do any given job. Naturally, *the more efficient the fixture, the lower the initial cost and the cost of operation.*

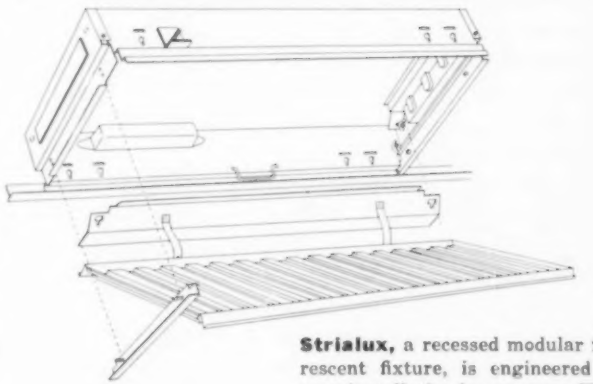
b) *Design for a low-cost light source where feasible.*

Sales appeal and appearance

Sales appeal is an intangible characteristic that depends only partly on appearance. It has to do with the impression of quality, soundness and integrity the product manages to convey through its form, its texture, its forthrightness, its "feel." Sales appeal is quite often attained in those aspects of a lighting device with which the customer comes in contact—the things he touches, like switch knobs, handles, adjustable motion devices, latches and other relamping gadgets.

Sometimes design is referred to as "fashion" or "style." These are unfortunate terms in that they connote something ephemeral, of but temporary value, a superficial treatment which is tacked on. Good design is more basic and yields something of enduring value. It results when the considerations of utility, maintenance, cost and sales appeal are integrated into a visually satisfying whole—one that possesses integrity, clarity and harmony. Extraneous ornament detracts from integrity, but not all ornament is extraneous; for example, perforations in a lighting fixture are not, for they help control the light quality. By clarity we mean that the design reveals its construction, operation, points of adjustment, etc. Harmony is not only a matter of good proportions but the ability of a lighting device to take its place in a larger frame of reference, be it room or building.





Strialux, a recessed modular fluorescent fixture, is engineered for easy installation by one man. Using grab handles (left), flexible sides of the housing compress to fit a prepared ceiling opening; handles are removed when housing rests on ceiling flanges. Sides are locked by four wing nuts, ballast covers are notched to slip on over nuts, and a vacuum-formed vinyl diffuser snaps over ballast covers (right). Resiliant edges and concealed hinges on diffuser allow quick relamping and maintenance. An end trim flange with captive screws covers rough edges of ceiling. 2' x 4' (shown here) and 2' x 2' units may be used individually, in continuous runs or in a variety of patterns. End knockouts permit flush fit without special joiner fixtures. Snap toggle yokes and precision plaster frame are available for installation in plaster or dry type ceilings.

Designers' Aids and Sources, Part III

The modelmaker and his shop

His personality, shop equipment and methods of product simulation

Today's industrial modelmaker might well be called a "technical generalist." He must be familiar with most of the craft needed to deliver product ideas into the real world; he must be acquainted with every industrial skill, a specialist in machine manipulation and materials handling; he must be familiar with rendering, and know the theory of color and its application. To turn the industrial designer's concept of a new product into actual form, the model builder must have the ability to visualize ideas quickly, and to keep in mind the end product while working out detail. This stress on the final product as a work objective, and the emphasis on general skill rather than specific ability, make him a rare craftsman in today's industrial picture. These are also the reasons that modelmaking has held much fascination for men not satisfied with a single skill.

In spite of the modelmaker's broad understanding of industrial and design problems, model shops are far from identical, either in skill or in the types of work they do best. Since a designer's need may vary from perfect appearance model to intricate working model, it is important to know what the strengths and preferences of the shops are. Some designers want a modelmaker who will exercise design judgment, others don't; some supply the modelmakers with dimensioned detail drawings, others send product renderings drawn to the exact size in which the model is to be made. But, regardless of the differences, all designers are looking for a man who respects the importance of subtle form and careful detail in design models.

For ID's third installment in the series on Designers' Aids and Sources, we have selected a few modelmakers, among the countless professionals throughout the country, who suggest some of the personalities and specialties that are available to designers and manufacturers. The profiles include: Work methods of these shops, varying in size from small operations to full-fledged big businesses; the industrial and educational *background* of the men who run these shops; the *equipment* they use; the *materials* with which they simulate products; and *methods* of fabrication and assembly.

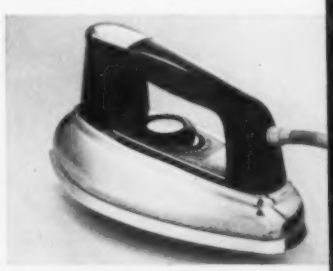
David Winkler

WIELGUS PRODUCT MODELS
Chicago

RAYMOND WIELGUS, like most modelmakers who work chiefly for industrial designers, fabricates all types of product models and admits to no specialization. (He is shown here with designer Jack Morgan perfecting a wooden mock-up for Dormeyer.) But in his shop, as in others, areas of specialization do emerge. Both personal inclination, and background and training account for the work in which the modelmaker is strongest.

Ray Wielgus, who opened his shop in 1949, studied architecture and industrial design. He was employed for four years as a modelmaker doing chiefly woodcarvings. The nine men who now work for him are wood pattern makers, tool makers, cabinet makers and sculptors. Consequently, it is in the appearance model where his shop is strongest; many of his clients have learned to rely heavily on his artist's sensitivity to form and detail in working out a model.

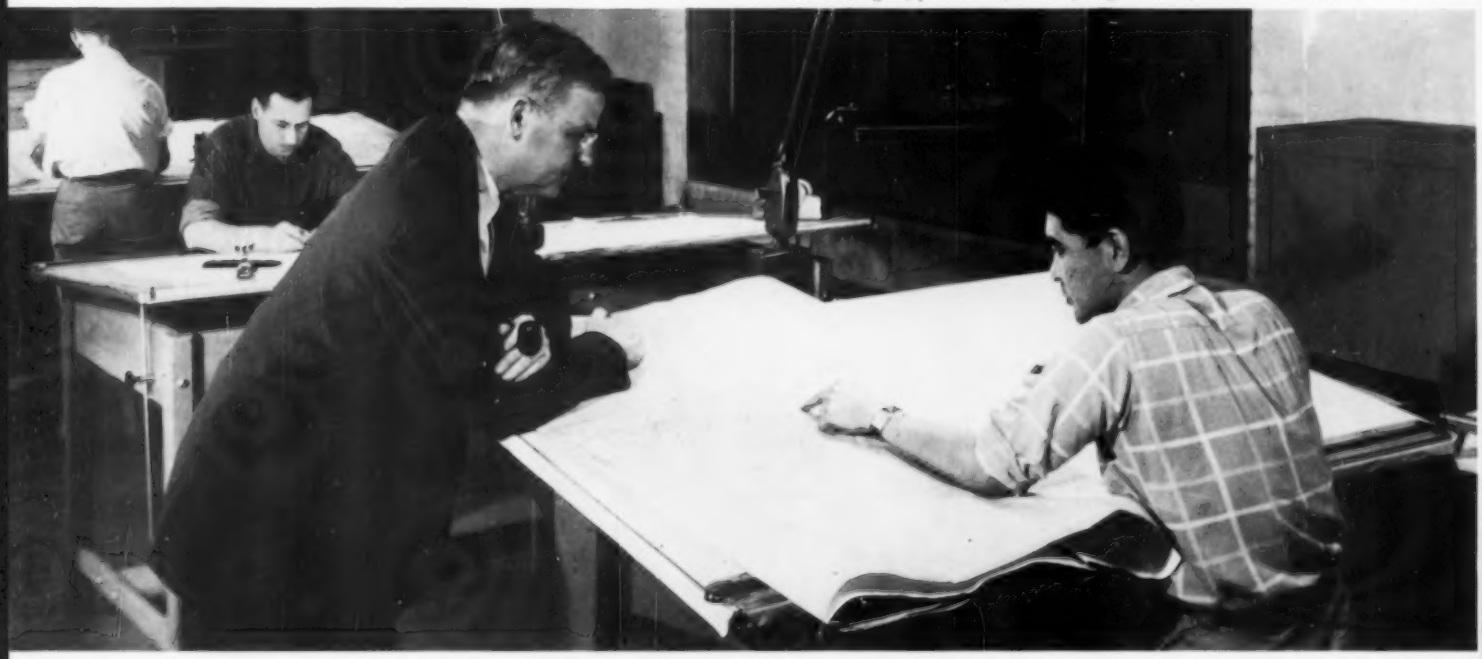
Specialization sometimes also arises from client preferences. Wielgus has found that many designers prefer full-scale models for best possible design visualization. He has also learned that full size models were no more complicated to make than scale models, and he now builds them almost exclusively, even of large products (refrigerators, washer-dryers). The Presto steam iron, shown here was built full scale for the firm of Mel Boldt; the wooden body was zinc metal sprayed and chrome plated to simulate the chrome-plated cast metal product. R. Wielgus has worked for most designers in the Chicago area.



The equipment standard sized model shops use actually varies fairly little. For metal components they are equipped with: milling machines, lathes, grinders, drill presses, sheet metal and welding machines; for wood parts and wood mock-ups: jointers, planers, bandsaws, sanders. The equipment used for metal work also takes care of small, flat plastic parts that can be machined; for the reproduction of large plastic bodies some shops have gone to the expense of purchasing vacuum-forming machines in preference to sending such parts out to be done elsewhere.

MODEL BUILDERS, INC. Chicago

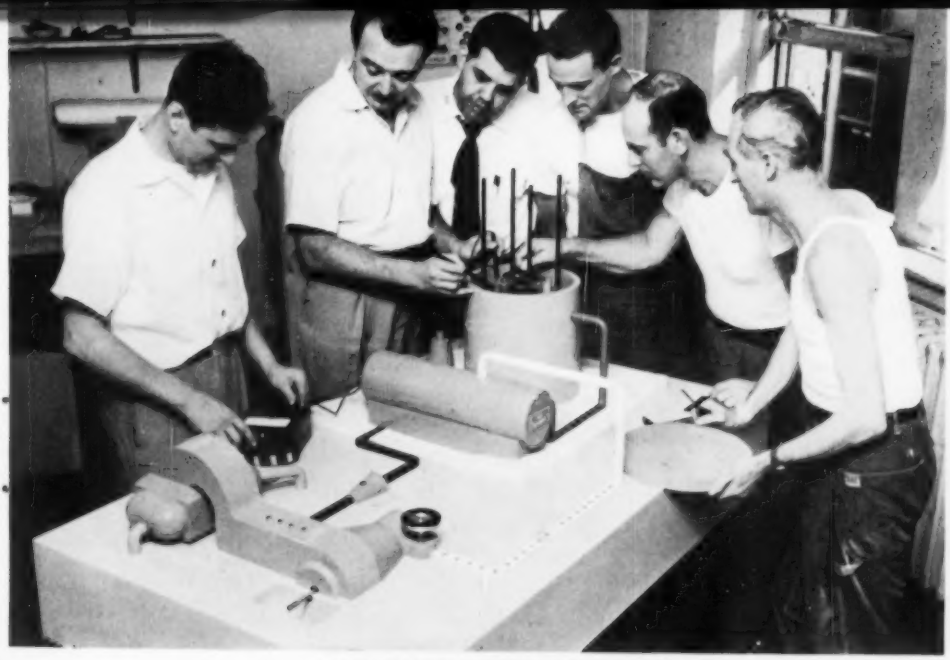
Wm. H. Chaffee, president, in drafting room of Model Builders.



BILL CHAFFEE received a call one day, according to one Chicago designer, about making a model for him that very week. "Sorry to let you down," Chaffee told him, "but I can't get to it right away. This week I am making two operating locomotives."

Chaffee's boyhood fascination with making models that work started him on a modelmaking career with emphasis on intricate mechanical models. He built them first as a hobby, next as a profession, and finally into his own business. Following a ten-year hitch in the laboratory of the Jam Handy Organization, where he built models for motion picture and special photographic equipment, and work as a Master Mechanic at a Chrysler Corp. division, he started his own shop in 1950. Although his firm, which now employs 17 men trained as tool and die makers, carpenters and instrument makers, builds a variety of models including product appearance models, Chaffee's inclination is naturally toward models of a mechanical nature. He says himself his shop is least skilled in the sculpturing model area (dishes, bottles, ashtrays, etc.). A good percentage of their output is in working product models (lawn mowers, tractors), architectural and engineering developments (foundry models, hydraulic power transmission housing) and a good deal of small prototype mechanism parts of extreme precision.

Display models of locomotives built to half-scale by Model Builders.



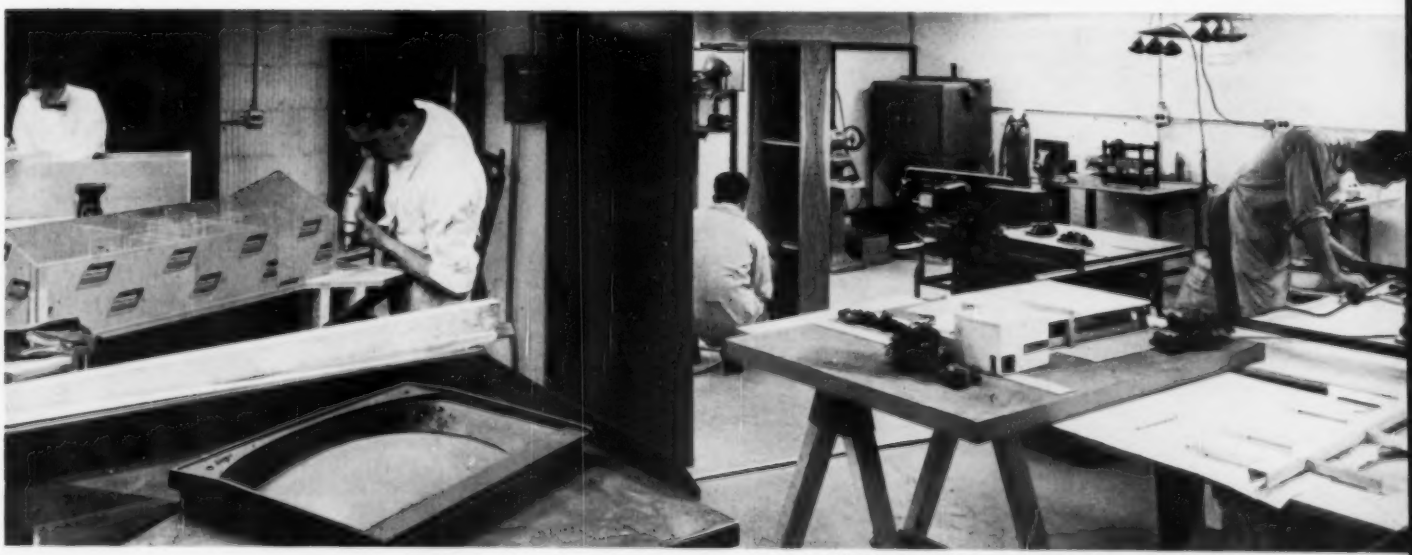
Curtis F. Pearl, second from left, checks demonstration model of reactor.

ARNKURT ASSOCIATE ENGINEERS New York

CURTIS F. PEARL'S original intention when starting his business in 1945 was to translate designers' renderings into mechanical drawings. His career as an independent modelmaker began when he was asked to turn the renderings into models as well. His background for building models was strong in two directions: he is a mechanical engineer and had worked in that capacity in his native Vienna and for an oil company in South America; he had been employed by a Massachusetts' manufacturer of novelties and toys where he had done some modelwork in plastic. As a result, the major amount of the work handled by his shop — he employs eight men trained from engineering to sculpture — falls into two areas: precision models in metal and wood (Navy training devices — scale demonstration piece of reactor shown at left — timing devices, vacuum cleaners), and sculpturing in wood and plastic (small plane models, dishes, radio cabinets). They have worked for the U. S. Navy, Corning Glass, Ideal Plastics, Revlon, and the design offices of Raymond Loewy, Monte Levin, Gerald Stahl.

REINECKE & ASSOCIATES MODEL SHOP Chicago

REINECKE & ASSOCIATES, the Chicago design firm, set up a complete modelshop three years ago to allow them complete control over the modelmaking process of their designs. Equipped professionally to take care of all of their work, the shop differs from the usual designer's shop in that it is prepared to take on outside assignments; 25 per cent of its time spent on contract work makes for an even work load for the shop's four craftsmen. This somewhat unique undertaking is made workable by a set of rules stringently applied to hold outside work strictly confidential. The shop has turned out models in all materials.



Charles Hatcher, at left, heads Reinecke model shop.

Material simulation is a knack as important to the modelmaker as his skill with equipment. Designers usually supply him with a list of production materials, but the actual selection of model materials is often left up to the modelmaker. Among the materials generally used on final models—plastics, metals, wood—plastics take the lead today. Their properties lend themselves well to a variety of applications and operations to very close tolerances. Brass and aluminum are popular for replacing metals of greater hardness, while wood is commonly applied to parts that do not require great precision, close a tolerance.

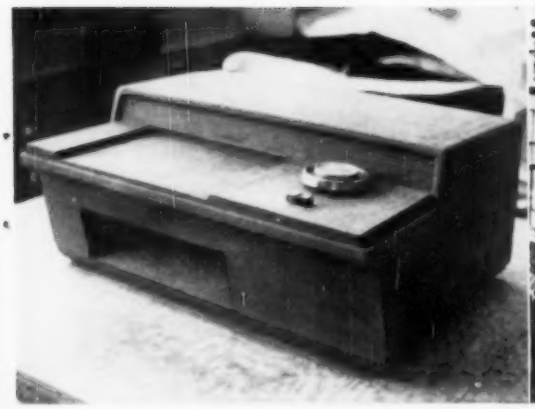
BREITKREUZ CUSTOM MODELS Detroit

ERWIN BREITKREUZ and the men who work for him, product simulation has been a special challenge for more than twenty years. They have been concerned with material selection and parts fabrication for a long list of models including home appliances, radios, timing devices. They have also done research and experimental model work.

A major factor in material selection is the purpose the model is to serve. Plaster and clay may be sufficient for study models; in appearance models the desired surface appearance matters regardless of the base materials used; still other considerations enter when dealing with models used as prototypes.

Since prototypes are often used to determine tool and die requirements, to establish finishing methods, coloring, and other production techniques, they usually must be made of the final production materials, or — where certain properties such as hardness make handfabrication impossible — of substitutes with properties close to those of the materials they replace. How a prototype is constructed is well illustrated by a model Breitkreuz built for the Detroit design firm Harley Earl, Inc., which had been contracted to design a new housing for the Thermo-Fax copying machine, a product of the Minnesota Mining & Manufacturing Company.

The Harley Earl office is equipped with its own modelshop where all clay and plaster mock-ups are done. The appearance model for the Thermo-Fax machine was done there in clay; a plaster mold of the mock-up was also taken at the Harley Earl shop. The mold was sent to Zenith Plastics, a Minnesota Mining subsidiary, where it was used to prepare the machine's Fiberglas housing by hand lay-up. The rough housing was turned over to Breitkreuz with detailed drawings of parts and a list of production materials. How Breitkreuz proceeded to assemble the prototype is shown on the next page.



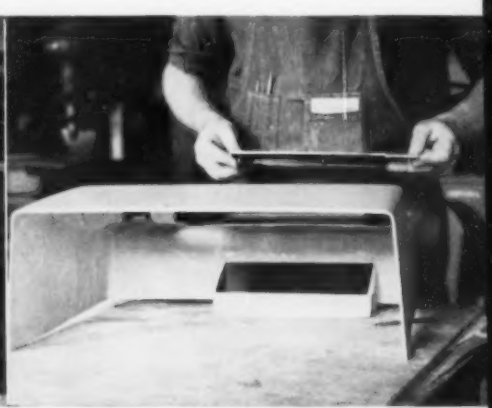
Clay mock-up of Thermo-Fax housing, built in Harley Earl Inc.'s shop, was for presentation of design to client.

Harley Earl's S. M. Highberger, head of design project, discusses drawings of prototype with Erwin Breitkreuz.

Rough Fiberglas housing, supplied by Harley Earl Inc., is refined by filing and prepared for trim parts assembly.

Trim parts, made of stainless steel in production, are machined from brass, and chrome-plated for prototype model.

Lettering on control knob, machined out of Plexiglas block, is engraved by pantograph machine, filled with paint.



Trim parts, assembled as "paper table," are fitted in position on the platform; exit chute is also chrome-plated metal.

Housing is drilled for stud holes to allow trim assembly. Control knob area and name plate get black enamel finish.

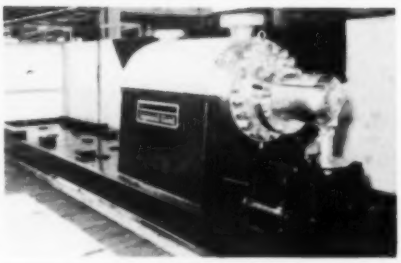
Exit chute is fastened into lower opening. Light blue-green baked enamel was color specified for production housing.

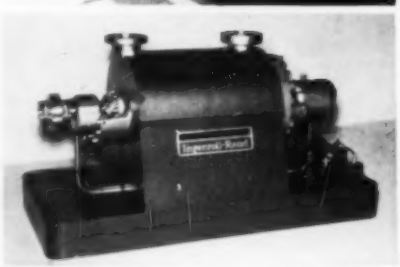
Specified color is painted on prototype. Name plate lettering, coined and filled in production, are silk-screened on model.

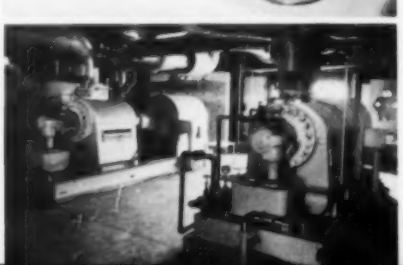
MODEL MASTERS New York

From left: C. K. Styron, E. J. Erickson, owners, and D. K. Styron, employee.

E. J. ERICKSON'S AND C. K. STYRON'S combined background in architecture and mechanical engineering, in machine shop work, and in building architectural models for the World's Fair and naval models during the war, has given them special knowledge for solving a major modelmaking problem: to assemble a model that must not only resemble closely the actual product, but must also demonstrate the product's operating features. Some years ago, they built such a model for the New York design firm Peter Schladermundt Associates, whose predecessor (Nowland and Schladermundt) had redesigned a boiler feed pump for Ingersoll-Rand. The model was to be used for selling purposes, for pump-action display at trade shows, and as a training guide for operating and maintenance personnel. Since production techniques did not have to be determined from this model (finished pumps had already been completed), the choice of materials depended largely on workability. Wood, painted black, was used for the base of the model; wood, painted gray, for the connectors on top. For parts of thin cross-section or dimensions to close tolerances, Plexiglas was used. Thin sheets of the plastic were heated to over 300° F, were pressed into shape over a specially prepared wood mold to form the housing, which was painted black. The small precision machine parts needed to permit pump-action display were made of Plexiglas, formed by lathe, milling machine, and drill press. Large mechanical parts, cast metal in actual production, were milled out of solid blocks of plastic; small rods that are part of the cast components were made of aluminum and glued into place. To make the plastic name plate, the modelmakers first fabricated a pattern of the plate in brass from which they made a plaster mold; the plastic was cast into the mold, and the name plate formed. It took Model Masters two months to make two models of the Ingersoll-Rand pump; made ¼ scale, each weighed 65 lbs.







Starting at the top:
Finished CHTA pump before installation.
Pump model built by Model Masters.
Detail components of display model.
Finished pump installed in power plant.

Yo Shiraki in shop of Y. Mogi.

Plastic shavings after milling operation.

Z. Nobumoto, left, and Y. Mogi, above.

Y. MOGI New York

Y. MOGI, an ivory carver who came from Japan in 1898 and turned to modelmaking about thirty years ago, has never worked in any other but the craft in which he was originally trained. The first models he ever built were toiletry articles in plastics, and he has worked exclusively in plastics ever since. Such specialization is rare in industrial modelmaking today, but it means that Mr. Mogi offers his clients a very high level of artistry in the sculpturing model area — bottles, decanters, dishes, watch cases, novelties. Mr. Mogi believes that heating or bending materials cannot produce the precision surface quality demanded by designers but that the desired affects can be obtained by machining and carving — the sole work method employed by him and his two craftsmen, who are also Japanese. All models made at the Mogi shop are sculptured out of solid blocks of plastic, mostly Lucite or Plexiglas.

Pictures this page Matilde Lourie

Y. Mogi at work on surface detail.

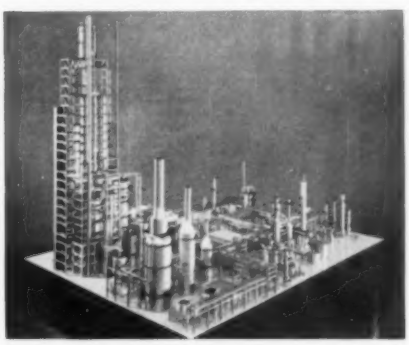
Plastic models built at Y. Mogi.

Methods of fabrication and model assembly depend to a large degree on the size of the shop. The small and medium size shops consist largely of one major area where parts for all sorts of models are fabricated, assembled, and finishes applied: a terrain model may be finished on the same bench on which a plaster toy is painted, and a plastic radio cabinet nailed. But the larger shops have found departmentalization an aid to the growing complexities of the model-making industry.

ATKINS & MERRILL, INC. Sudbury, Marlboro, Mass.; New York City

DONALD L. ATKINS, and his associates, have made it clear that modelmaking has graduated from off-beat cellar or garage operations into big business. From their own basement shop—started in 1938 to build scale models of ships and aircraft and later, during the war, training devices — they have expanded into a major modelbuilding industry, probably the largest in the country. They employ a staff of over 100 in three separate plants (Sudbury above). Atkins & Merrill attribute their success to two factors: foresight and methods of operation. They foresaw at the end of the war a rapid expansion of industrial developments delayed during the war, and began to concentrate on model work in the fields of industrial and nuclear engineering; only 20 per cent of their work is in the product design field. During their growth and steady expansion, it became evident that departmentalizing their various activities into separate though related units would increase their efficiency of operation. The way they have distributed their work-load within departments, and the products done in each, are discussed at the right.

MANAGEMENT at Atkins & Merrill, made up of technicians skilled in modelbuilding and experienced in leadership, includes from left to right: E. A. Marks, Vice President; D. L. Atkins, President; Stowell Pratt, Sudbury Plant Manager; N. C. Wiley Jr., Key Administrator; and R. Merrill Jr., Treasurer.



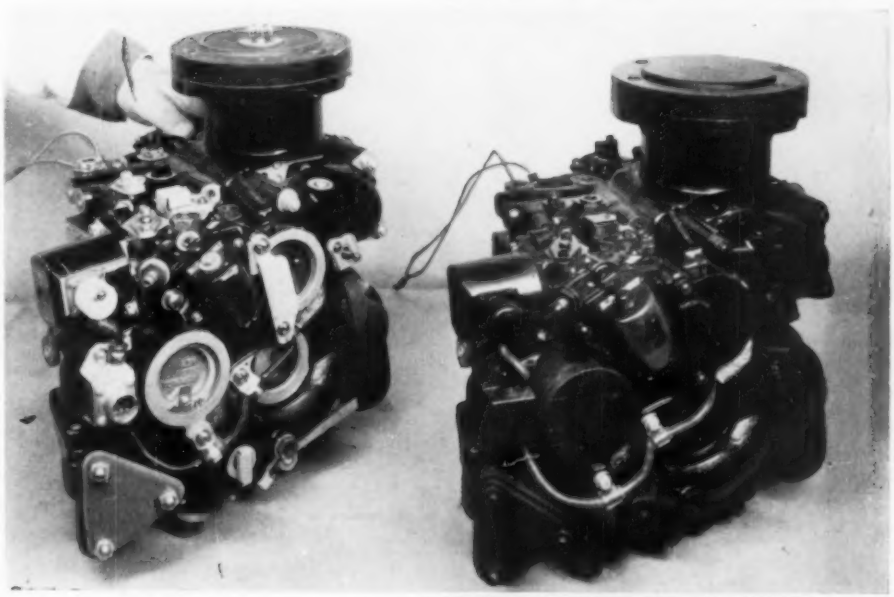
THE GENERAL MODEL SHOP, the company's original department, has not been affected by departmental break-up. Architectural models, scale models of sea and aircraft, industrial engineering models (Refinery Process plant shown above) and engineering study, presentation and sales models are fabricated here.

WOOD MOCK-UP department was established to permit separate construction of radar models for wind tunnel testing, prototype jet engines for air-frame installation, and wooden master models for plastic layup (above). Department is equipped with circular and band saws, oscillating and belt sanders, jointers, planers, and an unusual wood lathe capable of turnings 10 feet in diameter.

APPEARANCE DESIGN department is run by men skilled in hand fabrication who handle all consumer product models: radios, phonographs, TV sets, typewriters (the one above for IBM), are built full size or to any specified scale. In addition to standard model shop machines, the department has its own vacuum-forming equipment capable of forming plastic components 4' square.

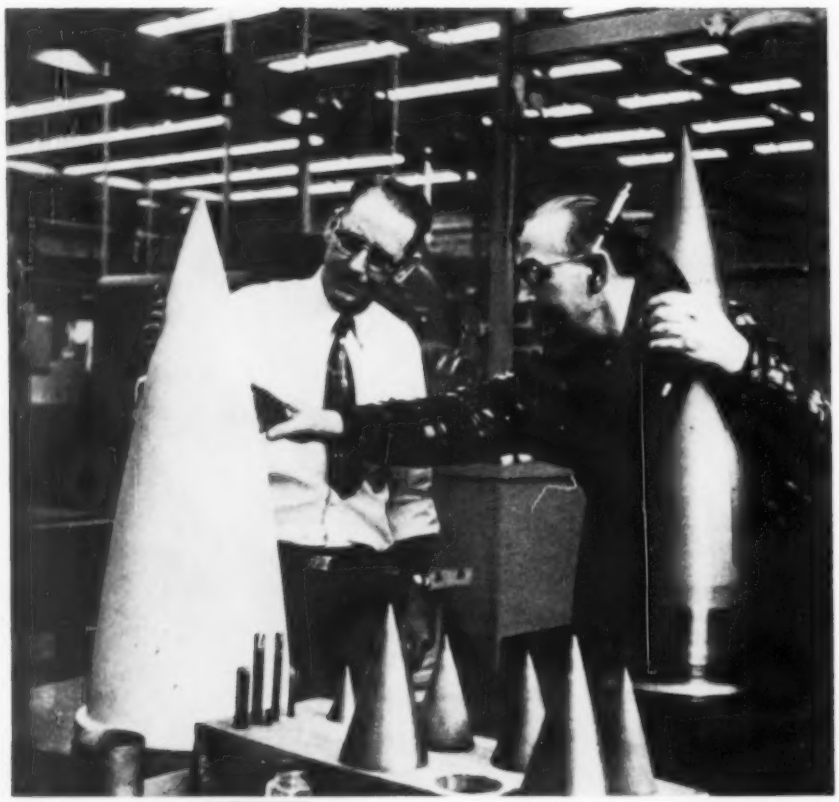
NUCLEAR department contains a 22-foot-deep pit with 4½ ton hoists specially constructed to take care of large nuclear models for reactor design. All components used with nuclear equipment, such as the coolant pump shown below, are constructed in this separate area.

MACHINE SHOP supplies the other departments with precision machined parts such as the aluminum jet engine flanges being cut in the picture above. All missile models and structural prototypes are made here on precision lathes, milling machines, drill presses.



PLASTIC MOCK-UP division is the most recent of all departments. Unlike Atkins & Merrill's New York City plant, which prepares all types of models for clients in the New York area, this plant in Marlboro, Mass., is restricted to a special kind of operation: casting plastic engine models in reusable molds, thereby permitting multiple engine mock-ups for engineering study and sales engineering applications. The models are cast in a two-part mold — the jet engine fuel pump at right in the picture above is the plastic reproduction of the production unit at left. The picture at right demonstrates the rigid casing and flexible inner liner of a molding process.

TECHNICS *a catalog of new products, materials, processes and finishes*



Pyroceram, Corning's new material, in its first application (top), forms the radome for a guided missile. Four types of Pyroceram—eventually there will be over a thousand—have been produced in pilot runs. Pyroceram can be made transparent, translucent, or opaque (left). The forms (below) show the material's versatility: the container was blown; the dish pressed. Regular glass-making processes are used.

Pyroceram—Corning's new material

The introduction by Corning Glass of a new crystalline material that is harder than high carbon steel, lighter than aluminum, and nine times as strong as plate glass is perhaps one of the most significant recent developments in industry's constant effort to produce materials with superior characteristics to meet the increasingly severe demands, in commercial and military applications, for greater strength, higher heat resistance, and lower weight. Called Pyroceram, Corning's new material can be produced with a variety of properties and gives the manufacturer advantages that are broadly twofold: Pyrocerams can be substituted for all glass applications, but the properties of Pyroceram are, in most cases, a vast improvement over ordinary glass and remain unchanged from room temperature to 1300°F; production techniques and equipment necessary for the manufacture of Pyroceram are the same as for ordinary glass.

Pyroceram is essentially a crystalline material formed from ordinary, non-crystalline glass. By the addition of one or more nucleating agents (the nature of which has not been disclosed) and subsequent heat treatments, ordinary non-crystalline glass is transformed into a material with a crystalline structure finer than that of ceramics. The chemical composition and growth of the crystals that form the inner structure of the new materials can be controlled, and this control makes it possible to produce Pyrocerams with a variety of properties.

Pyroceram was invented and developed by Dr. S. Donald Stookey of Corning's research and development division; he had, in the past, been responsible for the invention and development of many of Corning's photosensitive glasses. Over 1000 types of the new material have been made experimentally under Dr. Stookey's direction; of these, four types of Pyroceram have been commercially melted for pilot runs. The new materials lend themselves to applications requiring high mechanical strength, good electrical insulating properties, high deformation temperatures, good thermal shock resistance, and hardness—one of the types of Pyroceram produced at Corning is three to four times as hard as type 302 annealed stainless steel.

The first commercial Pyroceram product — a radome for guided missiles — was

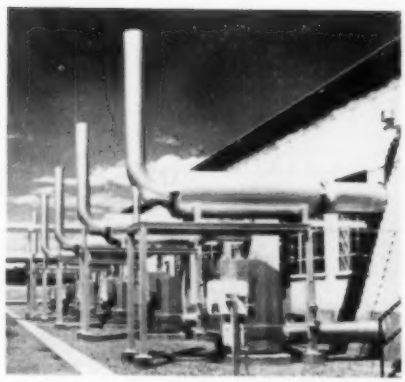
formed at Corning by centrifugally casting molten Pyroceram. It is too early to tell what will be the main drawbacks of these new materials, if any. Certainly, at this point the cost of Pyroceram is vastly above that of glass, and substitution of Pyroceram in applications where glass is used at present would not be economical. But the cost of the new materials will undoubtedly be reduced once production is under way. It is expected that at such time Pyrocerams will be used in combustion type electric turbines, jet engines of airplanes that fly at supersonic speed, chemical processing and home cookware.

Manufacturer: Corning Glass Works, Corning, N. Y.

Extended range of synthetic sapphire

The industrial application of synthetic sapphires is being extended by a new process of sapphire growing techniques developed by Linde Company. The boule on the right in the picture shown below is the raw material grown by the new process from which synthetic sapphires can be formed in various shapes — rods, disks, tubes, domes and balls. The new process also allows for a cut in synthetic sapphire costs. A large, 3 in. disk (at left in picture) costs about $135.00 for a thickness of ⅛ in. A rod, 1/5 in. in diameter costs about $1.40 per inch of length. The properties of synthetic sapphires — extreme hardness, resistance to acids and alkalies, good electrical insulation, strength at high heat, 2040° C. melting point — have proved desirable for applications in the textile, chemical and electronic industries. Specifically, synthetic sapphires can be used for windows and domes for infra-red systems, spacers and supports for electron gun structures, radiation pipes, textile guides, ball points for pens, phonograph needles.

Manufacturer: Linde Company, Division of Union Carbide Corp., 420 Lexington Ave., New York.



Engine silencing devices

To silence the exhaust noises inevitable when gas engine compressors are in operation, the Burgess-Manning Company has devised an exhaust snubber in use here with compressors at Durango, Colo., on the Pacific Northwest Pipe Line.

Boxes self-clinched

A new box stitching method uses stitches cut and formed from a continuous coil of wire, driven into both outer and inner box flaps and clinched inside the inner flap without any mechanism entering the box. Called Circuate Wire Stitching, the new method is a development of the Acme Steel Company.

The method is adaptable for simultaneously closing tops and bottoms of filled boxes with regular slotted or overlapping flaps, the sides and ends of filled five-panel folders, and two-piece telescope-style boxes as well as sides, ends, tops, and bottoms of outsize containers.

The heart of the new method lies in Acme's N6 series box stitching machines with special formers, shoes, and wire arcing mechanisms, which make possible self-clinched stitches. Flat stitching wire is drawn from a continuous coil mounted on the stitching machine, and an arc is formed in the cross section of the wire. The stitch is then cut and formed in the conventional manner except that the legs of the stitch are slanted inward as the stitch is driven into the box flaps. The inward curving motion of the stitch legs continues as the stitch is driven until it is "self-clinched" inside the inner flap. The arc in the stitch provides both greater holding strength as well as greater penetration strength.

Circuate stitches can be used to span the center seam of regular slotted boxes. The number of stitches required is reduced and the rate of closure stepped up. Seven-hundred average size boxes can be stitched in an hour. Approximately 13,000 stitches can be obtained from a 25-pound coil of flat stitching wire. Reloading becomes less frequent with the new machine so that operation is continuous over longer periods. Low cost wire from continuous length coils provides 534 stitches per pound.

Manufacturer: Acme Steel Company, 135th and Perry Avenue, Chicago 27, Ill.

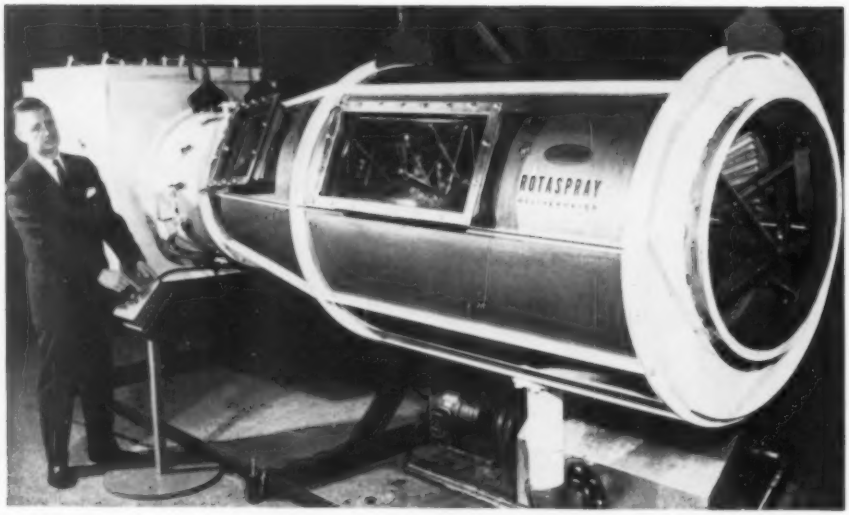
Designer-designed vise

The compact Pana-Vise is suitable for use in small assembly operations in model-makers' shops, designers studios, and industrial plants. Developed by Pacific Durable Products, the Pana-Vise is capable of achieving any compound angle. It swings 360° on any tangent to a half sphere and locks in any position.

The Pana-Vise can be used for metal or plastic products in sanding, sawing, soldering, buffing, filing, drilling or gluing.

Constructed of die-cast zinc and aluminum, the vise stands 6½ inches high, is 5½ inches wide. The jaw width is 2½ inches.

Manufacturer: Pacific Durable Products, 10107 Adella Ave., South Gate, California.



Self-cleaning air-conditioning

The Carrier Corporation has developed a new system for air conditioning large industrial areas, particularly in areas like textile plants where humidity and airborne dust are special problems. Carrier claims their new system, known as Rotaspray Weather Maker, is the first major change in central station conditioning apparatus in nearly half a century and cuts down size and maintenance enormously.

The key part of the new system is a spray unit. It incorporates a spin-dry principle to remove water droplets, lint and other foreign matter. A rotating eliminator operates at air velocities up to 2400 feet per minute — about four times the velocity possible with spray apparatus currently in use. The self-cleaning aspect of the conditioning is a result of the eliminator's rotating action which throws off soaked particles by centrifugal force.

Lint and airborne particles are scrubbed from the air by a "hurricane" of water droplets. Finer particles are collected by the eliminator and flushed from its surface by the water removed from the air stream. All removed lint and particles are carried in the water stream to a separation tank.

The Rotaspray consists basically of two sections, one dry and the other wet. In the first section outside air plus return air enters the unit through a cubically shaped mixing chamber. An axial flow fan pulls the lint-laden air into the unit and propels it into the wet section.

A battery of spray nozzles saturates the conically-shaped portion of the unit. The density of the atomized moisture provides an unusually high air-to-water contact. This results in efficient heat transfer providing control of temperature and humidity. The orifices of the spray nozzles can expand to twice their normal size to discharge restrictive material.

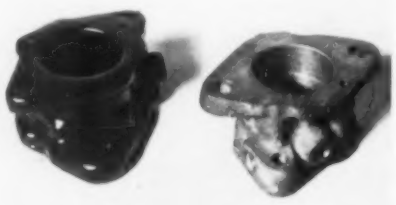
Water and all entrained particles from Rotaspray units drain to a common collection and separation tank. The recirculation pump, strainer and reservoir required by the conditioning station for each processing area in today's systems are eliminated except for their use at the single separation plant. Water, make-up, overflow and treatment are handled at the one point.

The Rotasprayer Weather Maker is produced in four sizes with capacities in the range from 10,000 to 30,000 cubic feet of conditioned air per minute. Overall dimensions range from three to six feet in diameter and from 16 to 23 feet in length. Light in weight, the units are arranged so that they can be suspended from a ceiling, installed outside on a roof or hung from a wall.

Manufacturer: Carrier Corporation, Syracuse 1, New York.

Protection for metal parts

Strip-off plastisol coatings to protect metal parts in shipment are not new, and their usefulness has been amply demonstrated and is generally accepted by companies who ship metal parts and products that are subject to rust, corrosion, dirt or damage both in transport and in storage. A new plastisol that dip-coats metal parts has been put out by the Chemical Processing Division of the Auburn Button Works.



The new material is low cost and can be applied by unskilled labor by simply heating the parts to be protected and dipping them into the plastisol. At the user's end, the plastisol can be peeled off easily by hand.

The plastisol provides, in addition to convenience, several kinds of protection. It forms a resilient cushioning that reduces shock and breakage. It guards against oxidation, rust and corrosion. It guards against nearly all chemicals, including acids, alkalies and solvents. It is completely waterproof, has high thermal and electrical insulating qualities, is unaffected by extreme hot or cold weather. It resists mold, mildew, salt air and water.

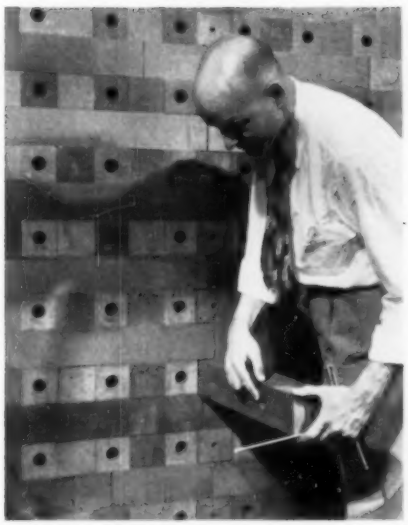
Manufacturer: Chemical Processing Division, Auburn Button Works, Inc., Auburn, New York.

Aperture masks for color TV

To utilize fully the viewing area of rectangular picture tubes used in color television, Superior Tube Company is now manufacturing rectangular aperture masks for efficient beam focussing. The use of 21 x 16 in. rectangular tubes for color TV saves five inches over the standard 21-inch round tube, which means that cabinets for the rectangular tubes may be lower. Manufacturing methods of the rectangular masks are the same as for the standard round TV masks; hundreds of thousands of tiny holes are etched into a paper-thin metal sheet by a photo-engraving technique. Once installed in the tube, each tiny hole in the aperture mask focuses the tube's three electron beams on the right

phosphor dot (red, blue or green) on the faceplate of the picture tube. The holes are tapered to eliminate beam deflection, minimize false colors and improve picture quality. Rectangular frames for the aperture masks are produced by Superior's affiliate company, Johnson & Hoffman, Mineola, L. I., N. Y.

Manufacturer: Superior Tube Company, Norristown, Pa.



Nuclear experiment at M.I.T.

The Nuclear Engineering Department at M.I.T. has devised a method for studying neutron behavior in full-scale reactors without any radiation hazards. 25 tons of a special grade of high-purity, high-density nuclear graphite were machined into blocks by National Carbon Company and were assembled by graduate students at M.I.T. into the 8-foot cubical pile shown here. Actual reactor conditions are simulated in this experiment when an indium disc is placed in a slot machined into the nuclear graphite blocks; use of a Geiger counter will then permit determination of atomic activity of the 8-foot cubical pile.

No repeats in wall covering pattern

Monsanto has developed a new plastic wall covering whose surface has been carefully designed to avoid any imitation of natural materials. Teraise — made from Teraise brand plastic—is textured in such a way that there are no obvious repeats in patterns.

The material has a matte finish, giving the colors variation in tones and values. It has no surface finishing or protective coating to wear off, is scrubable and, because of its rough texture, permits the use of steel wool or scouring powder on stubborn stains. It is flame and impact-resistant.

Supplied in continuous rolls 12 inches wide, it can be applied directly to the walls from the roll, either horizontally or vertically, with water-soluble adhesives and a minimum of wall preparation. The covering may be cut with scissors or knife, covers all minor wall imperfections and does not stretch or shrink, and can be applied directly over plasterboard or hardboard with little or no preparation.
Manufacturer: Monsanto Chemical Company, St. Louis, Missouri.

Portable radar alarm unit

A detection unit, employing radar to spot any movement within a radius of 25 ft., has been made available to protect industrial and commercial business against vandalism, burglary, or any sort of intrusion. Called Radar-Eye, the portable unit—it measures 17¼" in length, 10⅞" in depth, and 25¾" in height including the antenna —can be installed anywhere at a cost of between $400 and $500 according to accessory equipment used. Movement detection of the unit results from radar which, sensitive to any movement, instantly turns on floodlights throughout the protected area and also sets off a screaming siren. The alarm operates as long as motion continues and for one minute thereafter; Radar-Eye automatically shuts off and resets itself. The unit operates on a 115 v ac, 60 cps, single phase power supply and draws less current than a 60 watt bulb.

Manufacturer: Radar-Eye Corporation, North Street, Natick, Mass.

Transistorized power converters

Bulky, noisy power units that change dc to ac have now been converted into small, compact, noiseless units in which tubes have been replaced by transistors. The new power converters can be used for all sorts of applications where the available power is dc and the power required to run electronic equipment is ac. Availability of these compact units also makes it possible to use portable electronic equipment in aircraft and other such installations where only battery power is available. Standard power converters have been constructed to produce up to 250 va from 28 dc input. A 100 va output unit weighs 3½ lbs. and comes in a package approximately 3⅞" x 3⅜" x 5⅛". Dc to three-phase ac units are also available for special applications.
Manufacturer: UAC Electronics, a division of Universal Transistor Products Corp., 143 East 49th St., New York.

Special steel for supersonic speeds

To find high-temperature structural components for supersonic aircraft, designers have often had to switch to materials, which, though inherently weaker, did a better job of retaining their strength at elevated temperatures. A new steel alloy, developed by the Standard Pressed Steel Company, has a number of high temperature applications and is already being used to make the bolts which hold jet aircraft together. It is said to offer both high temperature resistance and good strength.

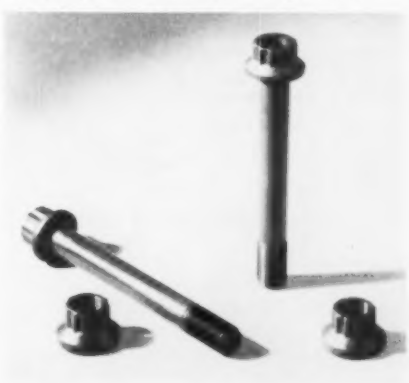
Named Hi Tm 9, the new steel alloy retains its high strength at elevated temperatures—a minimum tensile strength of 170,000 pounds per square inch at 900° F. Hi Tm 9 bolts are said to be as strong at 900° temperatures as many present-day fasteners are at room temperatures. Bolts made from the new alloy are reported to be 50% stronger at 900° than stainless and alloy steels currently being used in high temperature applications.

The initial fasteners, called EWB Tm 9, are a 12-point external wrenching type of aircraft tension bolt used for airframe fastening. Diameter sizes will range from ½-inch to 1½ inches.

The new fasteners are made from VascoJet 1000, a 5-percent chromium hot work die steel produced by Vanadium-Alloys Steel Company. (Hot work steels have been used for years as tool and die materials, hot forging, extrusion presses, and similar equipment.) The makers of the alloy single out two factors contributing to strength and temperature characteristics in the new bolts: 1) a larger than normal radius in the root of the thread reduces stress concentrations at the weakest point of the thread; 2) diffused nickel-cadmium plating is used instead of the conventional cadmium, providing good oxidation resistance up to 1000° F.

Hi Tm 9 series steel is suggested for use in aircraft engines, power plant steam and gas turbines, high temperature nuclear and chemical process equipment.

Manufacturer: Standard Pressed Steel Company, Jenkintown, Pennsylvania.



New look for broadcast equipment

Broadcast equipment, which has hardly undergone any change since the early days of radio, has now also been subjected to the current trend of making products smaller and lighter. Germanium rectifiers, one of the semiconductor "miracle gadgets," and weight reduction of the broadcast transmitter's final amplifier tube from 225 to 20 lbs., are responsible for the first miniaturization of this vital radio facility. According to GE, which developed the new 50 kw AM radio broadcast transmitter in its Technical Products Department, "customer oriented" new and more reliable broadcast equipment will influence the expansion of broadcast facilities. GE predicted that as the result of the new units the number of radio stations will increase from last year's 3,500 to 4,500 within ten years and to more than 5,000 by 1975.

GE's 50 kw transmitter is 13½ ft. long and 4½ ft. deep, replacing equipment that is 29 by 5 ft.; key to the transmitter's "new look" lies in the use of germanium rectifiers. This is the first time the semiconductors have been used to supply high voltage and reduce tube requirements. The new transmitter uses only 16 tubes; 40 to 50 vacuum tubes are needed in present day transmitters which operate without the use of germanium rectifiers. Currently used equipment has another space-consuming, bulky component to contend with: the final amplifier tube weighs 225 lbs., is hard to handle, and hard to get at. To allow the use of hydraulic lifts for tube maintenance purposes, a good deal of aisle space is necessary. With the smaller amplifier tube in the new transmitter, much less floor space is required and the buildings that house transmitters can be smaller. Another advantage of the new transmitter is that the simplified circuits and reduction of components require operating and maintenance personnel with much less technical training. The new transmitter will be priced in the neighborhood of $95,000.

Manufacturer: General Electric, Technical Products Department, Electronics Park, Syracuse, N. Y.

Self-locking metal end stops

A line of standard size tube closures for secure sealing of paper, fiber and composition open-end cylinders are now being stamped out of steel. Engineered to be self-locking, the metal closures have annular rings for additional strength and tapered walls with serrated edges; pressure from within the sealed package causes the closure to bite into the tube wall and hold securely. The present line of stock closures ranges in size from 1½" to 4¼" in increments to match standard paper tube sizes.

Manufacturer: Protector Products, Inc., 2142 West 15th St., Cleveland 13, Ohio.

Versatile fiber board

Wood particle board—a combination of wood fiber with a resin binder—has been a familiar substitute for lumber boards for some time. Granite, a new particle board, made by the Structural Products Division of National Starch Products, Inc., claims to go beyond the lumber-substitute level to the position of a versatile engineering material with broad applications.

Granite Board can be bonded with a variety of adhesives, veneered with surfaces ranging from wood to metal, pressed to varying densities and thicknesses with either curved or flat surfaces. The Board is stress-free because of its uniform particle size. There is a uniform and predictable expansion and contraction regardless of changes in temperature and humidity because the particles are not aligned with respect to grain direction. Granite is resin-bonded, hot pressed and sanded to .01-inch thickness.

Though primarily a flat material, Granite can be turned, ground, bent and curved, or laminated to produce draw molds, pattern stocks, and thick blocks. Raw Granite board can be painted, printed, colored, stained, or covered with a plastic coating. Faced with thin aluminum sheet, Granite acts as an insulator. It can be worked with woodworking tools. Its acoustical value is said to be above that of wood.

Manufacturer: Structural Products Division, National Starch Products Inc., Goffstown, New Hampshire.

Remote control of vehicles

The days when a man will sit in his home and direct his car to pick up his family without anyone having to drive the car are now definitely on the horizon. Lear, Inc. has already put out a system for remote control and operation of vehicles. It is being used for obtaining data or information from remote, hazardous, or generally inaccessible areas. The system, installed in any wheeled vehicle, uses electromechanical actuators to control the functions usually performed by the driver. A push-button starts the engine of the vehicle, and an aircraft-type control-stick steers the vehicle with right and left movement. A television transmitter keeps the operator informed of the vehicle's position. So far, the system has been used in testing of U.S. Marine Corps landing vehicles under dangerous surf conditions.

Manufacturer: Lear, Inc., 110 Ionia Ave., NW, Grand Rapids, Michigan.

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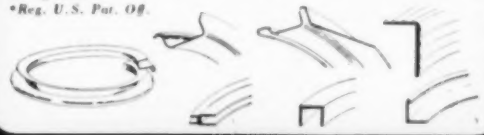

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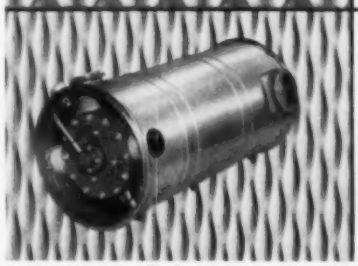

By eliminating rejection costs, savings of 20% were effected. Stainless RIGID-tex Metal (pattern 5-WL) made it possible. Product is an aircraft heater.

See Sweet's Design File 1a/Ri or write for more information.

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Manufacturers' Literature

Alnico Magnets. Park Magnet Company, 1557 Green Bay Road, Highland Park, Illinois. This new catalog describes and illustrates stock-size Alnico permanent magnets available in various shapes: horseshoes, rods, bars, discs and channels; dimensions and rated pulling power are given for each.

Aluminum Extrusions. Aluminum Division of Bridgeport Brass Company, Bridgeport 2, Connecticut. 130 pp., ill. A new handbook on the use of aluminum extrusions for architects, engineers, and fabricators. The book contains sections on the use of aluminum extrusions for architectural, structural, and truck and trailer uses, as well as industrial product applications; also included is information on aluminum extrusion alloys and their properties.

Aluminized Steel. Armco Steel Corporation, 6456 Curtis Street, Middletown, Ohio. 6 pp., ill. This folder covers the heat reflectance, heat and corrosion resistance, and costs of aluminum-coated Aluminized Steel Type 1 in various gages.

Automotive Parts List. Warshawsky & Company, 1900-PP S. State Street, Chicago 16, Illinois. 228 pp., ill. A comprehensive listing of replacement and new auto parts and accessories; catalog offers 75,000 individual parts for cars dating from the '20s to new '57 models.

Ball Bearings. Split Ballbearing Corporation, Lebanon, N. H. 24 pp., ill. A catalog of ball bearing types available in stock for a variety of applications ranging from ship stabilizer systems to tape recorders; also included are descriptions of available thin section and precision ground bearings.

Box Closure Methods. Acme Steel Company, 135th & Perry Avenue, Chicago 27, Illinois. 16 pp., ill. A guide for the evaluation of methods currently in use to effect stepped-up production in the closure of fiberboard boxes. Closure methods such as hand and machine gluing, taping, stapling and wire stitching are discussed along with advantages and disadvantages of each.

Butyl Rubber. Thiokol Chemical Corporation, 780 North Clinton Avenue, Trenton 7, N. J. 22 pp., ill. Portfolio contains information on market developments in Butyl rubber, a technical bulletin on Butyl properties, and a study of carbon black in Butyl rubber.

Ceiling Air Diffusers. The Multi-Vent Division of Pyle-National Company, 1334 N. Kostner Avenue, Chicago 51, Ill. 8 pp., ill. Low velocity ceiling air diffusers are listed as available stock items in this company bulletin which also gives engineering data on the company's Multi-Vent Troffer, a combination ceiling air diffuser and light.

Cold Formed Steel Bars. Republic Steel, Bolt and Chain Division, Cleveland 1, Ohio. 4 pp., ill. This two-color folder describes the company's die-form process for the cold reduction of steel bars into multi-diameter shaft blanks. It is pointed out in the folder that this production process results in a one-third saving in steel, lower scrap losses, less machining time, and lower shipping costs.

Computer for Airborne Control Systems. Philco Corporation, Government & Industrial Division, 4700 Wissahickon Ave., Philadelphia 44, Pa. 12 pp., ill. This new brochure covers Philco's new transistorized Transac S-2000. First developed to meet the requirements of airborne control systems, the computer operates on a low power consumption, is light weight, and offers high speed performance. Circuits and design features of the Transac are outlined in this new booklet.

Constant DC Voltage Supply. Sola Electric Company, 4633 West 16 St., Chicago 50. 4 pp., ill. A technical data brochure on the company's "DC Solavolt," a new, adjustable output, constant voltage dc power supply for laboratory use and electronic applications.

Contour Sawing Machine. The DoAll Company, Des Plaines, Illinois, 4 pp., ill. Folder describes DoAll's Model 5 Contour Sawing Machine which performs cuts of any complexity over a working area of 70 square feet while the work remains stationary. Specifications and design features and operating methods of the machine are also included.

Corrosion-Resistant Fittings. Horace T. Potts Company, Erie Avenue & D Street, Philadelphia 34, Pa. 21 pp., ill. A brochure listing Speedline pipe fittings in various shapes and sizes for stainless steel piping installations. The fittings listed are stock items available for various size pipes.

Dispersions For Industry. Acheson Colloids Company, Port Huron, Michigan. 4 pp., ill. Bulletin lists 44 colloidal and semi-colloidal dispersions of graphite, molybdenum, disulfide, mica, copper, glass and others, for protective and lubricating coating for the forging of special alloy steels, titanium, and other metals.

Electrolizing Process. The Electrolizing Corporation, 1505 East End Avenue, Chicago Heights 5, Illinois. 24 pp. Booklet describes how electrolizing overcomes friction, wear, abrasion and corrosion of the metal being treated; the actual process and effect of electrolizing on a variety of metals are also discussed.

Emergency Lighting Unit. Exide Industrial Division, The Electric Storage Battery Company, Box 8109, Philadelphia 1, Pa. 4 pp., ill. Folder discusses operation of temperature-compensated relays which automatically use rectifiers to recharge batteries after emergency light-protection unit has been in use.

Evapograph, Thermal Imaging Device. Baird Associates-Atomic Instrument Company, 33 University Road, Cambridge 38, Mass. 8 pp., ill. This brochure discusses the operation and applications of the Evapograph used for locating and monitoring hot or cold spots; the thermal imaging device is being used for temperature studies of industrial products such as lamination and insulation, combustion equipment and determinations of cooling efficiency in certain types of electronic assemblies.

Fir Plywood. Douglas Fir Plywood Association, Tacoma 2, Washington. 4 pp., ill. A booklet containing detailed charts on plywood's properties and design data, "Design with Fir Plywood" is intended to aid industrial designers, materials handling, packaging and plant engineers in plywood applications.

Flexible Couplings. Acme Chain Corporation, Holyoke, Mass. 7 pp., ill. Acme's new catalog contains information on flexible couplings for connection of two revolving shafts; horsepower rating and price are given for each of the listed parts.

Folding Doors. TransWall Coated Products Plant, Bemis Bro. Bag Company, 610 South Fulton Street, Minneapolis 15, Minnesota. 8 pp., ill. This folder contains design data, installation details and distributor list for the company's folding doors for use in offices, schools, homes, hospitals and factories.

Fused Quartz and Fused Silica. Amersil Company, Inc., 685 Ramsey Ave., Hillside 5, N. J. The company has put out a new, illustrated brochure on fused quartz and fused silica for use in laboratory equipment, lamps, optical assemblies, and chemical apparatus. Properties of these materials are discussed in detail and the various processes by which they are formed into usable products are explained.

GE's Series-String Receiving Tubes. General Electric Tube Sales, 1 River Road, Schenectady, New York. GE has made available a quick selection chart for their 600 and 450-milliampere controlled heater warm-up tubes. The chart classifies 52 tube types in the first series and 24 in the second according to elements, typical service, heater voltages, maximum ratings, and lists average characteristics.

Hand Trucks. American Pulley Company, 4200 Wassa-

Manufacturer's Literature, cont.

hickon Ave., Philadelphia 29, Pa. 4 pp., ill. This folder lists the company's "Ezy-Up" series of magnesium and steel hand trucks used for handling all types and sizes of appliances. Applications of the trucks are shown, and specifications of the Ezy-Up Endless Belt Stair-Climber for 650 lb. load handling are given.

Hardware Ideas. Amerock Corporation, Rockford, Illinois. 19 pp., ill. A listing of the company's stock list in hardware for appliances, equipment, cabinets, and furniture. Among the items listed are brass and bronze hardware, hardware for "contemporary" designs, decorator knobs, door hardware, and window hardware.

Heat Exchangers. Young Radiator Company, Racine, Wisconsin. 16 pp., ill. This new catalog contains design, capacity and dimension data required for selection and specification of heat exchangers for hydraulic equipment, Diesel engines, gas engines, machine tools, and for chemical, pharmaceutical and food processing.

High Temperature Alloys. The Carpenter Steel Company, 3164 West Bern Street, Reading, Pa. 20 pp. Booklet lists engineering properties and fabrication characteristics of ten high-strength alloys for high temperature use, and gives information on heat treatment, forging, cold working, welding and corrosion resistance; recommended uses are listed for each alloy.

Lubricated Plug Valve. Rockwell Manufacturing Company, Pittsburgh 8, Pa. 20 pp., ill. This recent edition of *The Flow Line*, the company's publication, describes how a young Swedish engineer invented the lubricated plug valve, and outlines the gradual growth of the lubricated plug valve's application throughout industry.

Magnetic Tape Recorders. Magnecord, Inc., 1101 S. Kilbourn Ave., Chicago 24, Illinois. 15 pp., ill. Company's new catalog lists their line of magnetic tape recorders and gives complete specifications for each type.

Materials for Fiber Glass Reinforced Plastics. Cadillac Plastic & Chemical Company, 15111 Second Avenue, Detroit 3, Mich. 14 pp. Included in this catalog of materials for fiber glass reinforced plastics are ranges of fiber glass fabrics and fibers, polyesters and epoxy resins and catalysts, and other supplies. The catalog also lists fiber glass cloths, tapes, matts, and polyester resins, epoxy resins and hardeners with available sizes, grades and prices shown under each material.

Material Handling Equipment. Stanley E. Morris Company, Los Angeles. 36 pp., ill. A pocket size, indexed catalog of material handling equipment including casters, wheels, hoists, chains, slings, fittings, cranes, lifts and hand trucks.

Miniaturized Gear Boxes. Southwestern Industries Inc., 5880 Centinela Ave., Los Angeles. 4 pp., ill. A folder discussing the company's equipment, research and development facilities; a listing of gear boxes designed for electronic and instrument applications is also given.

Non-Contact Control and Measurements. Industrial Gauges Corporation, West Englewood, New Jersey. 4 pp., ill. A pamphlet covering the subject of non-contact control and measurement of hot rod diameters for wire rod and other hot rolled shapes. Infra-rays emitted from the hot metal as it leaves the rollers actuate the gauges and controls which detect all possible diameter variations and automatically adjust the rollers.

Perforated Metal Sheets. Diamond Manufacturing Company, Wyoming (Wilkes-Barre area), Pa. 6 pp., ill. Bulletin explains the method of perforated metal sheets application to acoustical ceilings, side walls and enclosures; patterns available in perforated metal sheets are also illustrated.

Permanent Magnets. Magnetic Materials Section, General Electric, Edmore, Mich. 12 pp. ill. This new catalog covers both cast and sintered permanent magnets.

Plastic Tiles. Mastic Tile Corporation of America, Houston, Texas. 28 pp., ill. Designed for use by architects, builders and interior designers, this "spec" book lists detailed specifications for tile flooring and plastic wall tile, and also includes four pages of suggested floor patterns.

Plastic Valves and Pipe Fittings. Walworth Company, 60 E. 42nd St., New York, N. Y. 16 pp., ill. Bulletin describes polyvinyl chloride valves and fittings designed for piping systems in food processing and other applications where piping corrosive fluids presents a problem.

Power Train Package. Transmission Division of Clark Equipment Company, Jackson, Michigan. 8 pp., ill. A fold-out bulletin on the "Transverter," a stop-and-go power switching arrangement for house-to-house delivery trucks, busses, garbage trucks and various kinds of construction equipment.

Precision Metal Stampings. Johnson & Hoffman Manufacturing Company, 31 E. 2nd St., Mineola, New York. 4 pp., ill. The company's Bulletin No. 80 shows range of available precision metal stampings and deep-drawn parts, and lists the 17 materials used in production of the parts, as well as the finishes: electropolished, tumbled, plated.

Precision Pitch Gears. Fairchild Camera and Instrument Corporation, Robbins Lane, Syosset, L. I., N. Y. 12 pp., ill. This brochure discusses precision gears as compared to commercial gears and the methods and equipment employed in producing precision gears; quality control measures required for accuracy and close tolerances are also discussed.

Radiation Protection Materials. Ameray Corporation, Kenvil, N. J. 4 pp., ill. This folder describes available lead insulated blocks, panels and screens as well as lead doors, light-proof shades and protective windows for radiation protection with X-ray and radioisotope applications.

Radiography in Tube Production Control and Inspection. Instruments Division, Phillips Electronics, Inc., 750 South Fulton Avenue, Mount Vernon, N. Y. 6 pp., ill. An article, reprinted from a technical magazine, dealing with the basic requirements for precision radiography in the production control and inspection of subminiature tubes used by Raytheon.

Remote Location Inspection. National Electric Instrument Co., Inc., 92-21 Corona Avenue, Elmhurst 73, New York. 16 pp., ill. Catalog describes illuminated Borescopes used for industrial inspection of deep recessed areas otherwise inaccessible—cylinder walls, tubes, etc.

Stainless Steel Fasteners. Allmetal Screw Products Co., Inc. 821 Stewart Avenue, Garden City, L. I., N. Y. 12 pp. Catalog lists aircraft bolts, slotted and Phillips machine screws, flat and round rivets, and washers carried in stock; detailed dimensions and thread sizes are given for each part.

Stainless Steel Sheet and Strip. Allegheny Ludlum Steel Corporation, Pittsburgh 22, Pa. 32 pp., ill. This booklet has more than twenty tables including data on corrosion resistance, fabrication properties, and weight tables per linear foot in different widths and gages for a variety of stainless steels.

Teflon Tubing. The Polymer Corporation of Pennsylvania, Reading, Pennsylvania. 2 pp., ill. This bulletin points out the dielectric, handling and performance advantages of Polypenco Teflon spaghetti tubing for electric circuit applications, and states the electrical and physical properties of the 26 different-size tubings listed.

Zinc Alloy Die-Cast and Thermoplastic Molded Products. Gries Reproducer Corporation, 125 Beechwood Avenue, New Rochelle, N. Y. 9 pp., ill. Catalog lists the company's 67 different types of standard products, zinc alloy movable element units produced by the "Intercast" process, plastic and zinc gears and pinions, plastic coil bobbins, insert casting and molding in both zinc and plastic.

Classified Advertisements

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ARCHITECTURAL AND DESIGN PERSONNEL AGENCY—MURIEL FEDER—*A personalized placement service for top level architects, designers, engineers, draftsmen, interior decorators, and home furnishing personnel. Selective contacts arranged in a confidential and professional manner. Interviews by appointment. 58 Park Ave., N. Y. MU 3-2523.*

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Miscellaneous

PRODUCT STYLING & DESIGN. *Ambitious young business with "sixth merchandising sense" offers comprehensive service—(design development through blueprint specs.) Highly suited to creative and diversified assignments calling for experienced understanding of manufacturers' production and sales needs. Project or retainer basis. Box ID-119,* INDUSTRIAL DESIGN, *18 East 50th Street, New York 22.*

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Index to Advertisers

For Your Calendar

June 1-30. The Chicagoland Commerce and Industry Exhibition will be held at the International Amphitheatre, Chicago, Illinois.

June 14-30. The Boston Arts Festival, consisting of the work of sculptors, painters, and graphic artists, will be held in the Boston Public Garden.

June 20. The Seventh Annual Design Awards, sponsored by the IDI, will be presented at a lunch at the Hotel Ambassador East, Chicago, Illinois.

June 23-29. The International Design Conference in Aspen. Subject: "Design and Changing Values." (Address inquiries to: Mr. George Culler, Chairman, International Design Conference, 22 East Illinois St., Chicago, Illinois.)

June 24-26. The American Society of Heating and Air Conditioning Engineers will hold a meeting that will include two symposia: one on Sound and Vibration; one on Air-Conditioning Instrumentation. The address is the Manoir Richelieu, Quebec, Canada.

June 30-July 5. The International Housewares Show will be held at New York's Coliseum.

July 6-28. Processes for Design Problem-Solving. Three-week summer program, Institute of Contemporary Art, Boston, Massachusetts.

July 8-10. Third in a series of annual Creative Problem-Solving Institutes is planned at the University of Buffalo, Buffalo, New York.

July 27-November 4. The eleventh International Triennial Exhibition of Modern Decorative and Industrial Arts and Modern Architecture will base its program on the themes: 1) relationship of the arts, 2) contemporary architecture, 3) art production and industrial design. The address is, as always, Milan, Italy.

September 9-13. Instrument Society of America, devoted to the technology of instrumentation and automatic controls, will convene for its 12th Annual Instrument Automation Conference and Exhibit, at the Cleveland Auditorium, Cleveland, Ohio. About 500 exhibits are scheduled and some 100 papers will be delivered.

September 17-18. "Plastic Materials for Roof Construction" will be the topic for the fourth meeting of the Plastics Study Group of the Building Research Institute, the technical society of the building industry. The place is Geo. Washington University, St. Louis, Missouri.

October 24-25. The Aircraft Electrical Society will conduct its annual display of the latest aviation electrical products in the Pacific Auditorium, Los Angeles, California.

October 31-November 1. Third Annual Technical Conference of the Electron Devices Group, Institute of Radio Engineers, will be held at the Shoreham Hotel, Washington, D. C. Papers will cover developmental techniques and devices, including electron tubes and transistors.

November 1-4. Third Creativity Conference, sponsored by the Boston Institute of Contemporary Art, will be held at Arden House, Harriman, New York. Registration may be made at the Institute, 230 The Fenway, Boston 15, Mass.

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