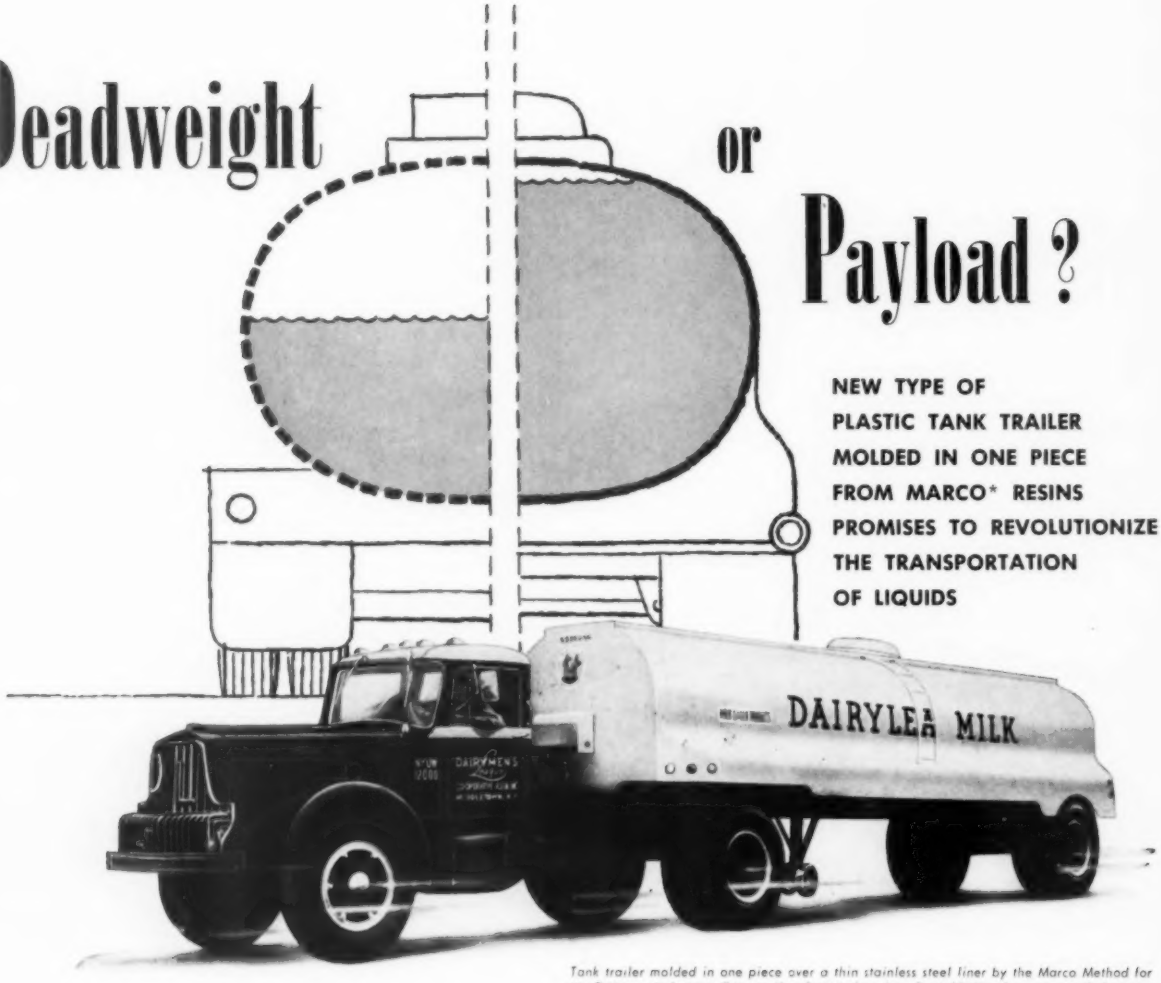
INDUSTRIAL DESIGN

April 1954 two dollars a copy

Deadweight or Payload ?

NEW TYPE OF PLASTIC TANK TRAILER MOLDED IN ONE PIECE FROM MARCO* RESINS PROMISES TO REVOLUTIONIZE THE TRANSPORTATION OF LIQUIDS



Tank trailer molded in one piece over a thin stainless steel liner by the Marco Method for the Dairymen's League Cooperative Association, Inc. Dust skirting, bumper, manhole cover and dry ice storage boxes also constructed of reinforced plastic. The light weight plastic construction offers a payload advantage of from 2,000 to 6,000 pounds. Brodix Corporation, builder . . . Insulation Associates, molders, Fanwood, N. J.

Meet the trailer that trades tons of weight for tons of added payload! Once a 4,000 gallon milk load on a single axle would be barred from New York State Highways. Now this new type of plastic trailer keeps this great load well under weight limitations. In the 3 months of its operation it has shown an operating revenue that should amortize the full cost of the trailer within 3 to 5 years.

Trailer trucks, molded of Celanese* Marco Polyester Resin and reinforced with glass cloth and mat, are practical for transporting many liquids. Marco Resins can produce molded structures that resist weather, moisture, heat, cold, vibration, impact and stress. Color can be molded in, and patch repairing can be done by an amateur.

THE FIRST STRUCTURAL PLASTIC

Is there deadweight in your products . . . unnecessary weight that hampers consumer acceptance and increases shipping costs? Look into Marco Resins. Already they are producing better furniture, boats, car bodies, industrial piping and storage tanks, corrugated awnings and translucent window panes.

Write for the Marco Brochure prepared by a pioneer in polyesters, Celanese Corporation of America's Marco Products Dept., Plastics Division, Dept. 152-D, 290 Ferry Street, Newark 5, N. J. Canadian affiliate, Canadian Chemical Company Ltd., Montreal and Toronto.

Celanese

*Reg. U. S. Pat. Off. **MARCO* POLYESTER RESINS**

VOLUME 1, NUMBER 2

INDUSTRIAL DESIGN

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

CONTENTS FOR APRIL, 1954:

On this 20-mile conveyor of the Whirlpool Corporation's "circulating warehouse," thousands of washing machine cabinets dangle like gay carnival flags in a village street. ——→

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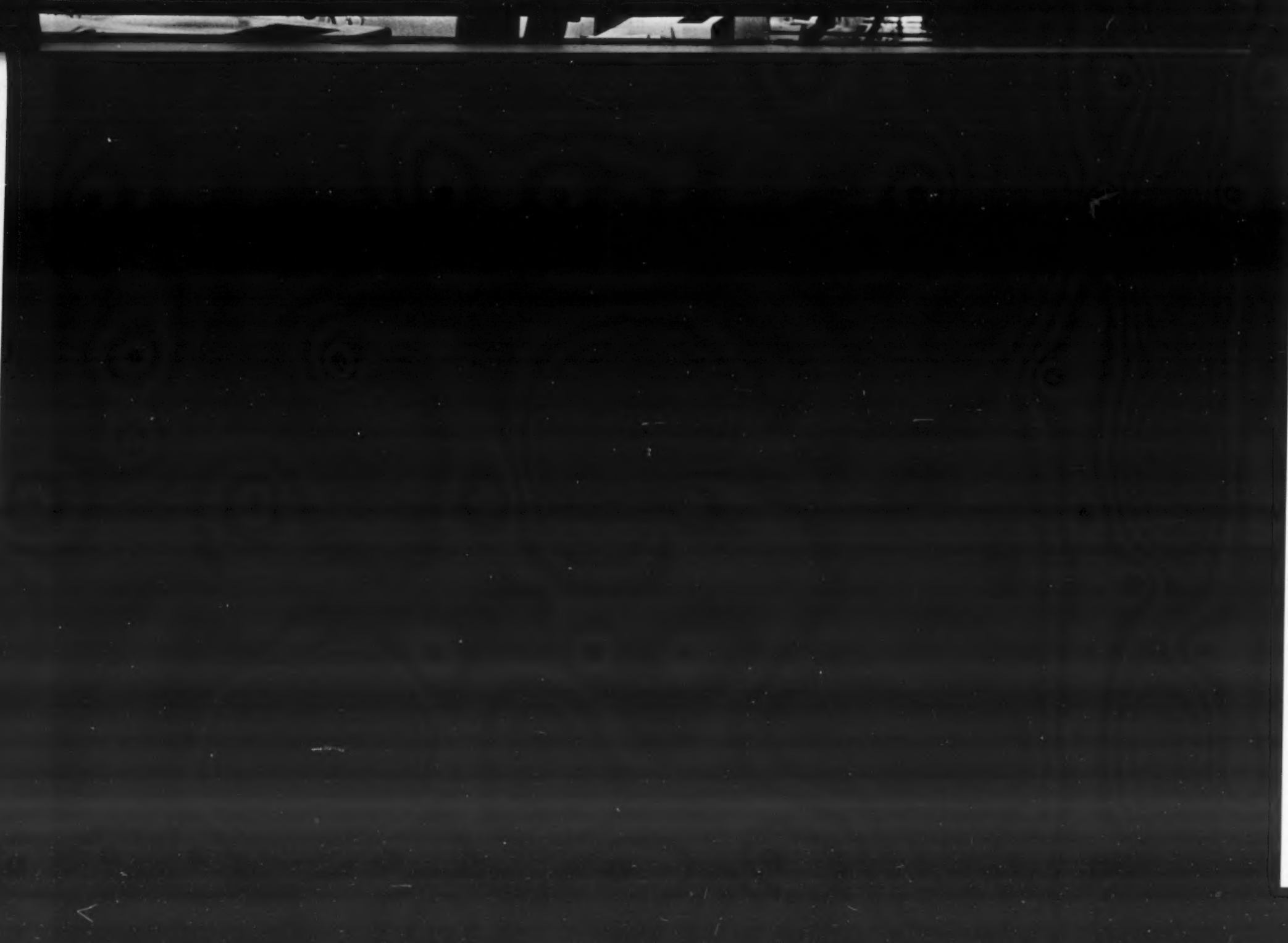


news

The world's first atomic-powered submarine slides down the ways at Groton, Conn.

Home Sweet Nautilus

On January 21, at Groton, Connecticut the world's first atomic-powered submarine was launched. The atomic workings of the *U.S.S. Nautilus* have been thoroughly discussed elsewhere; news, though, is the story of the ship's non-epoch-making, non-"classified" area—her living quarters.

Because the submarine can remain submerged almost indefinitely, the conditions under which her crew have to live become most important. Morale and efficiency are bound to deteriorate when eighty men are cooped up together for months at a time; the problem is to counteract and delay that deterioration as long as humanly possible.

The Electric Boat Division of General Dynamics Corporation, who have built submarines for the Navy for over fifty years, sub-contracted Lippincott and Margulies, Inc., to design the Nautilus' living quarters. Working closely with Commander Dean Farnsworth of the Medical Research Laboratory at the New London Submarine Base, they submitted hundreds of sketches on everything from ashtrays to a dumbwaiter, to a mess table that swiveled down into a bench-back.

Beyond the basic problems of any ship design (magnified here, of course)—getting the most from limited space and creating a psychologically bearable living atmosphere—a submarine presents peculiar problems of its own. Weight is the first; all joinerwork (furniture) on the *Nautilus* is aluminum. Noise is another: under water, the sound of a chain creaking as a man turns over in this bunk could carry to an enemy submarine. The berths on the *Nautilus* put a neoprene mattress on a fiber glass pan, which not only doesn't squeak but offers the man below a smooth surface to look at.

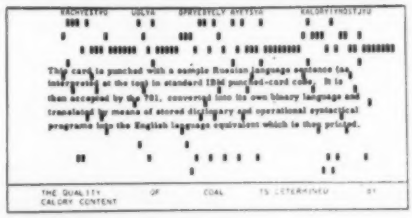
Light, where the restful fluctuations of daylight can never enter, is another problem. The power source of the atomic sub allows more power than usual for lighting; the problem was actually one of color—to find a light which would not turn coffee purple or butter dirty grey. A new standard white fluorescent unit, close to the color of incandescent light, was found to be kinder to the eyes—and psyche—than the blue white. Color is used throughout the living area to provide relief from the tension of work and close quarters.

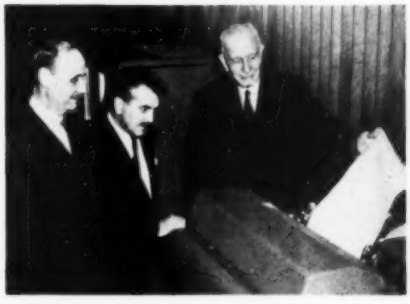
Condiment trays on the crew mess tables were a surprising problem. Large, by ketchup-eating Navy tradition, they stand on legs in subs, and were originally a device for holding, underneath, lights which shone down on the dining table. On the *Nautilus* they are removable and can be stashed away when the area is used for recreation.

Delayed by the inexorability of red tape, INDUSTRIAL DESIGN's complete story on the *Nautilus* will appear, we hope, in June.

The bi-lingual brain

International Business Machines announces that their giant electronic computer 701 can now translate from Russian (or in fact any other language) into English. Six basic rules governing transposition of words, choice of meaning, omission an insertion of words were worked out by experts at Georgetown Language Institute. "Rule signs," or tags attached to the Russian words and their English equivalent stored in the Brain's "dictionary," refer to these rules and enable the machine to select the correct meaning and word order for the Russian sentence punched into the card. The "dictionary" is electronically inscribed in plus and minus charges on a magnetic drum; "instructions" are electrical charges on the faces of cathode ray tubes in the 701's electrostatic memory.





701 (top), its child (center) and its parents (below, l. to r.): I.B.M.'s Dr. Cuthbert C. Hurd, Georgetown's Dr. Leon Dostert, and I.B.M. Board Chairman, Thomas J. Watson, with emerging English sheet.

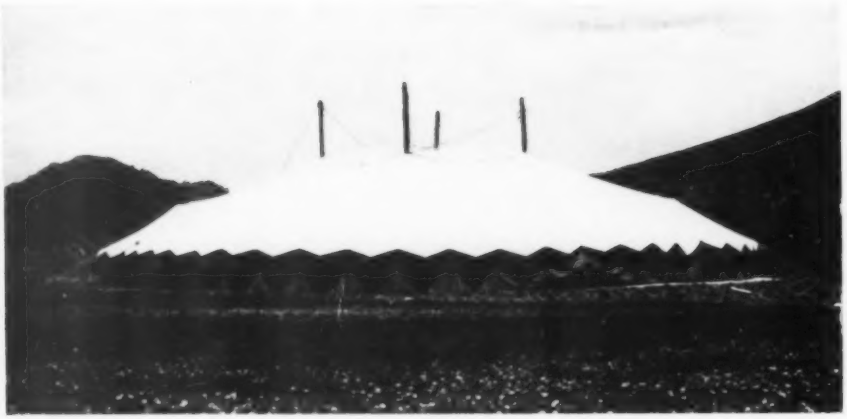


photo Betty Rosenzweig

Aspen's orange-canvas-covered amphitheater will shelter the Fourth Design Conference in June.

Planning: the Basis of Design

The fourth Design Conference at Aspen, Colorado, sponsored by the Aspen Institute for Humanistic Studies, will this year examine the role of the designer (and design) within the framework of our civilization. Believing in a greater rapport between the designer and those great areas of society his work touches, planners of the Conference have invited as speakers scientists and social scientists—planners, communications experts, economists, statisticians—as well as those in the more expected aesthetic fields. The aim of the Conference is better design through better understanding of society and its needs.

The Conference this year will begin on Wednesday, June 23 and end on Tuesday, June 29. Five conference days will follow a schedule of morning meetings and round table discussions, while in the afternoons the principal speakers of the morning will hold seminars. Exhibitions will be changed daily; a concert is also planned by the Conference committee—designer Will Burtin, M.I.T.'s Gyorgy Kepes, and Standard Oil (N. J.)'s art director, Carl Maas. Entrance fee: $35; designers are advised to make early hotel reservations through the Aspen Institute, Aspen, Colorado.

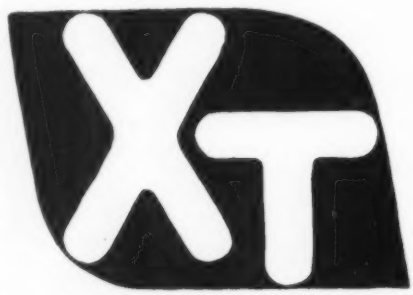
Tenth Triennale di Milano

Travelers abroad this summer must begin to think about Europe's big international exhibition of modern decorative and industrial arts and of modern architecture. Now in its thirtieth year, the Triennale di Milano will be held from August 25 to November 15, at the Palazzo dell'Arte at Parco in Milan. The Tenth Triennale, in the words of the programme, will be based on two problems: "The recognition of the new terms of collaboration existing between the Arts and Industrial production, as the most vital and actually important problem of today; and the reaffirmation of the unitarian relationship existing between architecture, painting and sculpture."

The exhibition promises to be rich and complex, in both individual exhibits and in the way they are related to synthesize the problems of modern life. Sections follow a regular progression, starting with dwellings and furniture. Next, mass-produced building elements and furniture illustrate that such "standard products do not necessarily exclude imagination and expressiveness." The significance of industrialization—the theme of the Tenth Triennale—will be further reflected in carefully chosen exhibitions of prefabricated building materials, and structures themselves in the Park. Other exhibits in the Park will include town planning, outdoor advertising, and "transportation architecture"—motels, trailers and land and air transport. In the Palace itself, selected single objects and industrial design exhibits will form a single unit to emphasize the reciprocal influence between the hand-made product and the machine-produced one. Many other exhibits of objects illustrating taste and materials will supplement the major theme.

In addition to participation in the international exhibits, many nations will have separate pavilions in the Park. In the absence of an official United States Pavilion (there is still hope), American designers and manufacturers may participate individually and unofficially in the international exhibitions under Italian rules. These are excerpted below: "The Exhibitors belonging to countries not officially represented at the show shall deal directly with the Triennale. The Exhibition shall be opened to artists, craftsmen, and industrialists, as well as to so-called art publishers. Those who intend participating in non-official foreign shows shall submit their application to the Triennale's Management *before April 30, 1954* by writing directly for blanks and rules to the Secretary, Tommaso Ferraris, Ufficio del Triennale, Palazzo dell'Arte al Parco, Milan."

It looks as though American industry may have to depend on individual initiative to represent us in Milan. Any takers?



Above: emblem of the Tenth Triennale of Milan, international exhibition of industrial arts to be held August 25-November 15.

At the British Industries Fair: the Shaw precision moisture meter, a new electronic device to test moisture content at any depth in closely-packed spools of yarn.

British Industries Fair

Yet another exhibition, of a quite different character, is the British Industries Fair, to to be held in London and Birmingham from May 3-14. A cross-section of British production will be on view, representing nearly a hundred different industries from confectionery to concrete mixers. Consumer goods will be shown at two halls in London—Olympia and Earle Court—while Birmingham will show the heavy industry. Among products and materials to be shown is a new ice-proof reinforced glass for aircraft and auto windshields; an electric current passing through a thin coating of gold film warms the glass. Household objects include a dimpled, oblong frying pan. Advance catalogues can be obtained from any British Consulate.

GEORGE A. BECK, Industrial Designer. Responsible for the distinctive design of all commercial products of General Electric Company's Electronic Division, Mr. Beck's success is reflected in his deft skill for combining appearance values with functional requisites. Mr. Beck is currently executive vice president of Industrial Designers' Institute.

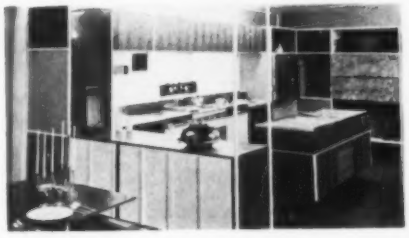
For men with new ideas...
CHICOPEE SPECIALTY WEAVES

No wonder America's leading designers turn to the Lumite Division of Chicopee Mills. For Chicopee fabrics bear that adaptability needed in so many of today's new designs. Their application ranges from outdoor and indoor furniture to automotive interiors; from decorative exterior finishes to industrial filter fabrics; from radio and TV grille cloths to shade-cloth applications. Write us for samples, "feel" their texture. See how you, too, may benefit from their unlimited functional possibilities. LUMITE DIVISION, Chicopee Mills, Inc., Dept. S-1, 47 Worth Street, New York 13, New York.

SARAN, COATED FIBERGLAS, VISCOSE RAYON, PAPER FIBRE AND COMBINATIONS OF SYNTHETIC AND NATURAL YARNS

Kitchen of Tomorrow

The latest (even *that* adjective seems weak) in super-electronic devices, in a totally modern kitchen, made Frigidaire's model kitchen a high point of GM's recent super-production Motorama in New York. Functioning, though for the most part unavailable in mass production for a long time to come, the kitchen had an ice-maker which delivers cubes, crushed ice or ice water at the pressure of a glass; overhead cabinets which descend to desired height at the wave of a hand; waist-high refrigerator and freezer with vertically sliding doors which open up, or down, or both ways, at the touch of a latch; and every possible stainless steel cooking device sliding up out of the counter. The one luxury we could dispense with is the recipe viewer which projects not only the recipe but a full-color picture of the dish. Other devices, like the one-lever temperature-dial faucet, the spring-loaded touch latches, and the resilient plastic-coated floor seem eminently desirable to us. Designer: Alexander Kostellow, head of Pratt Institute's Department of Industrial Design; executed by Frigidaire engineers.



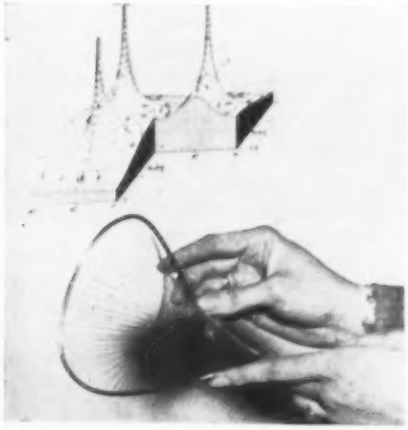
In Frigidaire's Kitchen of Tomorrow, ice-maker is in foreground; work counter runs back to freezer, passway, refrigerator (rear); ovens (top) rise from counter.

The shape of science

"In seeing by the scientific method, designers can understand their tasks better, and professors can present subjects to their students more clearly." The elegant shapes below are three-dimensional models of advanced mathematical concepts, from an exhibition prepared by Konrad Wachsmann at Illinois Institute of Technology's Institute of Design. The models, by delineating the kinds of space modern man can see, may help designers to discover the tenuous shapes inherent in materials and patterns of stress. They trace spirals, circles, and irregular patterns with intersecting colored threads; complex geometric shapes are in plastic, plaster and paper. The range of space we see was further visualized in the exhibition by photographic effects produced by the electron diffraction camera and electron microscope, used in examining the geometry and structure of metallic surfaces. The far reaches of visualized space were shown in photographs taken by Mount Palomar's 200-inch telescope of the moon and gallaxies up to 120 million light years away; the near, by a mechanical model of a water molecule. The idea of visual presentation is not new; drawings by Leonardo da Vinci (in the picture below, left) foresaw these models almost five hundred years ago.

Material for this exhibition was contributed by Chicago-area universities, Mount Palomar observatory, General Electric Company, Sylvania Electric Company, and the W. M. Welch Manufacturing Company.

I.I.T. is in the news for another reason: seven Institute of Design students recently took $2,650 out of $3,000 in prizes in an advertising campaign design contest held by Ciba Pharmaceutical Products, Inc., N. J.

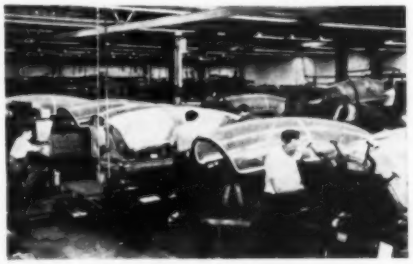


Left and below: the abstract is made concrete; models from Illinois Institute of Technology's exhibition of the visualization of space.

The potter's art

Ideas for production come from many sources; one of the best is still the individual craftsman. Some very handsome stoneware was shown recently at Bonniers, New York, the work of the Viennese-born English potter, Lucie Rie. In black, warm white or a combination of the two, the elegant, slightly off-beat shapes of her tall teapots, graceful pitchers, vases and cups take their *cachet* from the perfect, personal relationship between etched lines and glaze, creamy mat surface, and precise edge.

Stoneware teapot and cup by Lucie Rie: precise, delicate relationships and shapes.



Goodyear Aircraft's plastic canopy assemblies for Boeing's B-47. *Coming up: a new kind, sectionalized, for the new B-47E.*

Business is great!

Despite the omens, plants are booming all over. Westinghouse Electric has finished construction of a new $45,000,000 appliance plant in Columbus. Carboloy Division of General Electric and Scintilla division of Bendix Aviation Corporation both announce plant expansion programs for 1954. General Tire and Rubber Company expects to put its new $6,000,000 polyvinyl chloride resin plant in Ashtabula (O.) into operation while Goodyear Aircraft will soon produce canopy assemblies for Boeing's B-47E jet at Litchfield Park, Ariz.

I.D.I. Cites Manufacturer, Publisher

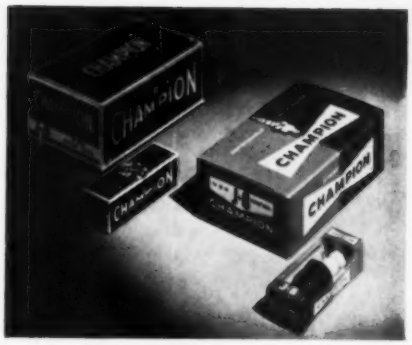
The Industrial Designers' Institute held a bang-up all-in-one celebration in Philadelphia during the last week in January. The national board of trustees met to elect a new president (see page 14). Then, at an evening meeting and party, Charles E. Whitney, ID's publisher, was made an honorary member of the I.D.I. for his work on behalf of the design profession. The Philadelphia Chapter was host for the occasion; they did themselves proud. Concurrent with the meeting, an exhibition, the second annual "Greater Philadelphia Design in Industry" show at the Art Alliance displayed not only the work of Philadelphia designers but designs by senior students at the Philadelphia Museum School of Industrial Design.

Last but certainly not least, the Philadelphia group presented an award to Rohm & Haas as "the Delaware Valley firm which made the greatest contribution to the advance of industrial design during 1953." The company was cited for its work in advancement of design for molded acrylic plastics. During the past year, Rohm & Haas engineers conducted over fifty design classes in various parts of the country, attended by more than eight hundred designers and plastics molders, discussing such acrylic possibilities as vacuum metallizing, light piping, invisible attachments, and other optical design problems to which molded plastics might apply.

Signs in the Street

Street signs, already the topic of some discussion at Yale (ID February), are now the subject of an extensive exhibition at New York's Museum of Modern Art (to May 2). In contrast to the calligraphic horror of the now-immortalized Fifth Avenue and 53rd Street corner, three sections of the large exhibition give varied answers to the two-fold problem of signs: legibility and appearance. Experimental signs using new materials (particularly Plexiglas) and special color lighting, familiar signs from our cities and highways, and signs using symbols and lettering, shipped from Europe, are visible in the flesh in the Museum's garden, and in enlarged photo-murals and color slides which show them *in situ*.

Part of the exhibition is given over to the lighted signs which create a whole new profile for our cities at night; good examples include a proposed sign for Lever House by Alexy Brodevitch, and an existing sign for Olivetti in San Francisco. Other sections show the possibilities of combining simple, well-designed letters with color and light; there is a "Wall of Letters" by Alvin Lustig, executed in white Plexiglas by the Rohm & Haas Company, and a collection of photographs of famous signs using variations on the basic Roman letter. These include the Bauhaus sign by Gropius, and Philadelphia's PSFS building by George Howe. (See ID June, for more).



Increased legibility and forcefulness are result of L. & M. redesign (see below).

Would your product sell you?

The importance of package design as a mass selling device was discussed, with color slides, by designer J. Gordon Lippincott of Lippincott & Margulies, Inc., at the first New Products Seminar held by Hilton and Riggio in New York recently. "A recognizable background helps people quickly identify and remember the product . . . Continuity of that visual impression to tie in advertising with the point of sale is next." Too many manufacturers expect the public to remember several different identity devices, he said. Symbols too can be effective, but must not be overwhelmed by other design elements. Lippincott's ideas work: his packages won first and second prizes in a recent Brewers of America competition.

Errata: Atlas and Calculator

We are sorry, but not hesitant, to admit that there were two errors of fact in our February issue which we wish to rectify: 1. The World Geo-graphic Atlas, designed by Herbert Bayer and published by Rand McNally for the Container Corporation of America is, contrary to our statment, now purchaseable. It may be obtained for $25 from the Container Corporation, 38 South Dearborn St., Chicago. 2. The small Contex Calculator, designed by Sigvard Bernadotte and Acton Bjorn, shown on page 66 in "Designs from Abroad," is available in this country through the Bohn Duplicator Company, 444 Fourth Avenue, New York.

Product Design at M.I.T.

A special two-week course in creative engineering and product design will be given at Massachusetts Institute of Technology this summer, from Monday June 21 to Friday July 2. Directed by Professor John E. Arnold, Director of M.I.T.'s Creative Engineering Laboratory, the course will "explain, discuss and demonstrate exercisable or trainable factors contributing to the human creative potential." Seminar members will present illustrative product development case histories. Tuition, $160. Address inquiries to Summer Session Office, Room 7-103, M.I.T., Cambridge, 39.

The I.D.I. award is handed by Philadelphia Chapter chairman Clyde Shuler (r.) to Rohm & Haas' Dr. David A. Rothrock (l.) while the company's Robert P. Gardner (black specs) and I.D.I. ex-president Stuart Pike watch.

Student members set up their work for the Philadelphia I.D.I. exhibition (below); at right, Raoul A. Ibarguen, designer and model maker with a part of his exhibit.

GLASS

HAS

STRENGTH

Glass no longer need be considered a fragile substance. Today, articles of glass can be remarkably resistant to physical shock and extreme temperature change.

Corning Glass Works can select from its 400 glasses in regular melt a composition which has pre-determined properties designed to meet rigorous service requirements. Mechanical and thermal strength may also be ingeniously combined with chemical, electrical and optical qualities.

Corning places great emphasis on research to extend the use of glass; the company's Design, Engineering and Production Departments skillfully transform scientific advances to practical application. These staffs are always ready to assist you with product planning.

New potentialities of glass are described in the booklet, *Glass and You*, a copy of which awaits your inquiry to the Design Department.

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Corning means RESEARCH ENGINEERING PRODUCTION DESIGN *in glass*

People

Calvin M. Bolster, who retired January 1 as a rear admiral in charge of Naval Research, has been named coordinator of Development of the General Tire & Rubber Company. Admiral Bolster received the American Rocket Society Gold Medal Award for rocket research in 1949.

Robert L. Gruen, New York industrial designer, has been elected president of the Industrial Designers' Institute to succeed Stewart W. Pike.

Severin Jonassen, industrial designer, has joined Philco Corporation of Philadelphia as a member of the Product Development Department.

Susan Karstrom, former art director of Science Research Associates, and **John Lang,** formerly advertising manager of Motorola, Inc., have joined the Dekovic-Smith Design Organization, Chicago.

Frank M. Mansfield III, formerly Detroit district engineer for Torrington Co., has joined the Carboloy Department of General Electric Company, Detroit, as manager of product planning.

Anton Parisson has been elected an associate of Peter Muller-Munk Associates, Pittsburgh; **Kenneth A. Van Dyck,** for the past eight years assistant director of styling at Eastman Kodak Company, joins the firm as Executive Manager.

Seymour D. Wassyng has joined Von der Lancken, Lundquist and Sorensen, New York industrial designers and architects, as an account executive in the product design department. He comes from six years with Walter Dorwin Teague.

Harold Zierhut and **Albert Poirier** have been appointed associate designers on the staff of the Packard-Bell Company, Los Angeles radio, TV, and air conditioning manufacturers. Mr. Zierhut comes from automotive styling at the Ford Motor Co.; Mr. Poirier, from Sylvania Electric Products Division.

Robert L. Gruen, new president of the Industrial Designers' Institute (*see page* 12).

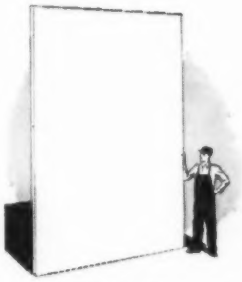
For your calendar:

American Management Association, 23rd National Packaging Exposition, Atlantic City, N. J., April 5-8. Exhibitions of 400 companies will be in Convention Hall; a conference will include packaging program case studies by Sears Roebuck and Co., Kraft Foods Co., and Monsanto Chemical Co. Registrationis open to all businessmen; hotel reservations should be made promptly through the Packaging Exposition Housing Bureau, 16 Central Pier.

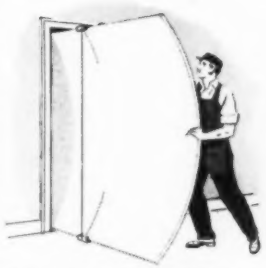
(*Continued page* 136)

100 uses already developed

Several hundred still to be found

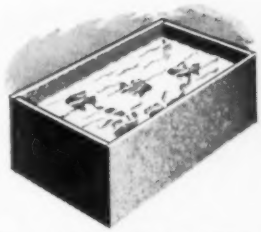


This material has **SIZE** . . . its Big Sheets — up to 8′ x 14′ — abolish many former size limitations.



This material has **STRENGTH** . . . permanently crackproof, an 8′ x 14′ sheet is easily jacked through a 6′ door. (Used as sheathing, no corner bracing is required.)

This material has top **INSULATING EFFICIENCY** . . . an ice bucket, made with this material, keeps ice cubes for 36 hours.



This material has maximum **MOISTURE RESISTANCE** . . . solely for demonstration, five pieces, simply nailed together, make a useable vase for flowers — or a goldfish pool.

This material has **FLEXIBILITY IN USE** . . . bent on an 18″ radius, it holds its new form with no loss of the original strength.

This material has **NO GRAIN** . . . its fine, homogeneous surface takes any paint or stain, holds a coat of paper, leather or any other laminate glue can hold.

This material has remarkable **SOUND-DEADENING QUALITIES** . . . demonstrated by its frequent use as underlayment for linoleum or wall-to-wall carpeting—in leading hotels throughout the country.

This material works **EASIER THAN WOOD** . . . its nail-holding properties (by the pull-through test) are among the highest.

This material is available in five forms and/or thicknesses—each having its own special qualities and properties. All are weatherproof—all may be used indoors or out.

In one form or another, users have already found more than a hundred applications for Homasote Boards.

15/32″ **HOMASOTE**—in Big Sheets up to 8′x14′. Time-tested in all climates—from Alaska to Central Africa to Little America.

5/8″ **HOMASOTE TYPE U** — more resilient. In 4′ x 4′ size.

21/32″ **HOMASOTE TYPE RD** — strong, tough, weatherproof. Single-ply in sizes up to 8′ x 14′; 2- or 3-ply in 2′ x 8′ size, V-grooved. Strong—live load 75 lbs. with 2-ply 32″ o.c.; 3-ply 48″ o.c.

3/8″ **STRIATED HOMASOTE PANELS** — offering endless variety of pattern, depending upon how cut and positioned. Panels are 8′ in length; 16″, 32″ and 48″ in width.

3/8″ **WOOD-TEXTURED HOMASOTE PANELS** — molded from actual board, retaining everything but the splinters. (Dimensions same as for Striated Panels.)

May we send you literature, samples and detailed specifications? Kindly specify which boards sound interesting and address your inquiry to Department 69.

SEE OUR CATALOG IN SWEET'S

HOMASOTE COMPANY

TRENTON 3, NEW JERSEY

letters

Dissension

Sirs:
. . . In the last few years I note that in publications such as yours the stylists are referred to as designers. . . .

The stylist, who works principally with the ornamentation of the car and the smoothing out of lines, cannot be called the designer of the automobile any more than the man who designs a woman's dress can be called the designer of the woman inside it. The determining of the anatomy, which involves advantageous placement of such things as wheels, engine, transmission, etc., is done with a very sympathetic attitude toward the styling requirement, which is usually to get the car as low as possible. If a considerably lower car is achieved with adequate ground clearance, adequate head room and entry room, etc., this is really more of a design engineering accomplishment than it is a styling accomplishment. . . .
E. S. MacPherson
Vice President, Engineering
Ford Motor Company
Dearborn, Michigan

Isn't it possible that the fashion industry depends on the female's undying faith in the ability of the man who designs a dress to design the woman inside of it? Disrespect for basic structure is evidently a convention of long standing, and perhaps it is not a bad one.—the editors

Sirs:
I prefer the name "Product Styling" to "Product Design" or "Industrial Design" as the latter have been used extensively for mechanical design or industrial engineering. Yet, I admit that the title "Product Styling" may also have the connotation of pure "surface-type dressing."
Clifford E. Grube, Product Stylist
Webster-Chicago Corp.
Chicago, Illinois

Medic as Model

Sirs:
. . . The successes and triumphs of any designer help all of us, and I'm in favor of as much recognition as possible in the lay media. In the journal of our profession I would like to see more articles of a purely technical nature. Articles by designers concerning particular products and the design problems pertaining to them should be presented somewhat like the papers that physicians publish in the medical journals. . . .
Irvin J. Gershen
Gershen-Newark, Industrial Design
Newark, New Jersey

Admonition

Sirs:
. . . Naturally the make-up of the magazine itself must be acceptable to the very highest standards of industrial design, and certainly the element of playfulness is a wonderful part of our work; to have it pay off and achieve what we really want it to do—that is, to excite interest and to communicate its idea—I feel that layout should be done with more discretion than it was in the first issue. I am not referring to any particular page in the magazine. It just seems to me that there are some places where tricks have been used that do not in any way clarify or intensify the material presented.
Jim Powell
Weber Showcase & Fixture Co., Inc.
Los Angeles, California

Selling Salesmen

Sirs:
. . . I feel that your publication will perform a great service to industry by promoting a greater understanding between engineers and industrial designers as well as marketing executives and designers by explaining the problems of industrial design. To me, the industrial designer must be better than the top sales executive since he has to sell salesmen on the reasons why his designs will sell. He must prove why his style, even though it may not appeal to the sales manager, will be bought by the mass markets.
H. L. Reycroft, Manager
Industrial Movement Sales Division
The Sessions Clock Co.
Forestville, Connecticut

Designers and Engineers

Sirs:
As an ex-industrial designer and as a human engineer, it has long been obvious to me that some medium was necessary to remove the chi-chi connotation from sincere designers. Your publication should enlighten both engineers and designers to a more sympathetic understanding of each others' problems.
Robert P. MacNeil
General Dynamics Corporation
Groton, Conn.

Sirs:
. . . We are very conscious of appearance in our product and have done a great deal over recent years in improving the looks of our power shovels particularly. However, I think the big field for styling is in connection with quantity production items such as automobiles, appliances, etc. In the heavy machinery industry utility, reliability, and accessibility are more important. Consequently our principal effort must continue to be along the lines of improving the field performance of our product.
P. S. Stevens, Vice President, Engineering
Bucyrus-Erie Company
South Milwaukee, Wisconsin

Correction!

Sirs:
An embarrassing mistake in your handsome February issue of Industrial Design has caused considerable *Sturm* and even *Angst* among advanced thinkers in the Totalized Con- and Perceptual Planning fields. You list my date of birth as 1931. But then enroll me at the Bauhaus Kindergarten in 1926, when I would have been, of course, minus five. Actually I was plus five and only modesty keeps me from adding superplus, although documents at Weimar would insist.

It is this kind of pedestrian error which always dogs the thinking of those who would unify, integrate, co-ordinate, and otherwise globally plan our forthcoming monolithic universe.
Cozz McFields
New York, N. Y.

NOWHERE ELSE CAN PRODUCT DEVELOPMENT MEN COMPARE BASIC MATERIALS SIDE BY SIDE

More than 8,000 product development men from all branches of industry attended the 1st Basic Materials Exposition held in New York, last June. Enthusiasm for the exhibits and the ideas presented ran high.

2nd Basic Materials Exposition Offers Product Engineers Only Opportunity To Examine All Materials In One Place

Now product development men have an exposition all their own—the Basic Materials Exposition to be held in Chicago, May 17-20, 1954 at the International Amphitheatre. This new concept in expositions hits at the heart of the problems of the research and development engineer, and the marketing and merchandising executive. It presents all the available materials and basic product components in one place for easy, side-by-side comparison.

HOW BASIC IS BASIC?

In clarifying the meaning of the Exposition to research and development people, Clapp & Poliak, Inc., producers of the Exposition, said, "We define *basic materials* as the *things* from which *things* are made. They include metals and alloys; plastics; non-metallic materials; coatings, finishes; fabricated parts and forms; and basic components."

The Basic Materials Exposition is a scientific showcase for materials only. It excludes the processing and production machines that so often overshadow materials.

WIDE RANGE OF EXHIBITORS

Scores of leading producers of basic materials and basic product components are planning to exhibit. Their products cover the range of materials from textiles to laminated wood; metal alloys to thermoplastics; metal forms to ceramics and glass, to name a few. Great interest is being taken by government agencies who view the Exposition as an opportunity to broaden the range of materials being used in various defense projects and in atomic energy installations.

Survey Shows 77% Of Engineers Found "Something New"

Seventy seven percent of the engineers in attendance at the 1st Basic Materials Exposition found something new, *not previously used* in their company's products which they will now consider or use; and found *new applications* for materials now being used, an independent survey on attendance reaction revealed.

Twenty nine percent* said they had discovered new uses for materials formerly rejected.

These discoveries show that the design and materials engineers who attended the 1st Basic Materials Exposition *found what they were looking for*. And, it can be expected that attendance at the Basic Materials Exposition in Chicago this Spring will be equally rewarding.

*Totals more than 100% because respondents answered more than one question.

MAIL COUPON TO:
CLAPP & POLIAK, INC.
Show Management P-4
341 Madison Avenue,
New York 17, N. Y.

BASIC MATERIALS CONFERENCE PROMISES RESEARCH AND DEVELOPMENT GUIDANCE

Concurrent with the Basic Materials Exposition will be the 2nd Basic Materials Conference. Headed by T. C. Dumond, editor of Materials and Methods, this year's conference will be patterned around the most asked-for subjects at the past conference. These subjects cover a wide range of materials and materials applications. While the names of panel speakers have not yet been released, the following tentative program is an excellent indication of the worthwhileness of this conference to you and your company.

Monday, May 17
- a.m. Review of New Materials Developments.
- a.m. Rockets and Guided Missiles— How New Materials for Them will Benefit Industry.
- p.m. Erosion and Corrosion —How to Combat Them

Tuesday, May 18
- a.m. The New Metal Forming Processes—How, When, and Where to Use Them—
  - Shell Molding
  - Powder Metallurgy
  - Investment Casting
  - Impacting
  - Extruding
- p.m. How, When and Where to Use Nonmetallic Materials
  - Plastics
  - Carbon and Graphite
  - Glass and Ceramics
  - Rubber

Wednesday, May 19
- a.m. Adhesives and Adhesive Bonding of Metals and Plastics
- p.m. How to Set Up and Operate A Materials Department.

International Amphitheatre
Chicago, May 17-20, 1954

BASIC MATERIALS EXPOSITION

The Product Development Show

YES! *I would like to attend the Basic Materials Exposition and Conference.*

- ☐ Send me expedited registration tickets for the Exposition. No registration fee.
- ☐ Send me registration forms for the Materials Conference.

Dept. P-4

Name_____
Title_____
Company_____
Address_____
City_____ Zone____ State_____

Letters

Query

Sirs:
. . . Did the Texas study of school rooms take into account the possibility that the children's morale—and consequently health—might have been improved by the mere increase in attention they received during the tests?
W. H. Breuning
Cincinnati, Ohio

Joy apparent

Sirs:
. . . What pleased me most in this magazine is the variety of methods you are employing to report design activities—as projects, as individual case histories, as analyses of an office's operating techniques, and as aesthetic critiques. All the devices seem to me to present facets of design activity that have been long unreported. . . .

Lastly, Lustig and the staff seem to have taken great joy in producing this magazine. It is apparent in the pages. . . .
Raymond Loewy
New York, N. Y.

Background for Design

Sirs:
You will be particularly interested to know that your magazine has been very favorably commented upon by:

A. The Chief Engineer of a company making hand tools.
B. The Advertising Director of a company manufacturing printing press machinery.

This is just a small sample of the wide diversification and interest that your magazine is apparently satisfying.

The format of material in its diversification is judiciously chosen, and I hope represents a general theme to be followed in subsequent issues.

I think you are to be congratulated on introducing the philosophical background for design in your first issue. It is my belief that you should never drop the ball as this is one of the most important tools by which a designer can maintain his identity.
Raymond Spilman
New York, N. Y.

Value as reference

Sirs:
. . . I think you have given status to the profession of industrial design. It's a source book which will be of great value not only to designers but to every one connected with industry.
Julien Elfenbein, Editorial Director
Home Furnishing Group
Haire Publishing Co.
New York, N. Y.

A Few Kudos

Sirs:
Congratulations and thanks to you and your colleagues for the excellence of your new magazine and for providing a voice for those of us in the field of industrial design.
Dave Chapman
Chicago, Illinois

Sirs:
. . . You finish reading it with the conviction that it can and will do the job you have set as your target.
William F. Ogden
Manager—Product Planning
General Electric Company
New York, N. Y.

Sirs:
. . . Industrial Design, in my opinion, completes the circle of reporting the newest and finest in all the various design fields.
Everett Brown
Everett Brown Associates
San Francisco, Calif.

Sirs:
. . . Industrial Design magazine was awaited with great anticipation. After receiving and reading the first issue, all I can say is that it is just what we have been waiting for.
H. E. Anderson, Jr.,
The Coolerator Company
Duluth, Minn.

Sirs:
I have just seen your first copy of Industrial Design, and I think it is terrific.
. . . Congratulations.
Suzanne Gleaves
House & Home Magazine
New York, N. Y.

Sirs:
. . . This magazine is certain to gain wide acceptance and approval from the industrial world.
M. Clevett
Engineering Unlimited
East Natick, Mass.

Sirs:
. . . I like your format and I like your editorial style.

Under separate cover I am sending you a purchase order for a subscription to future copies of your publication. Need I say more?
Harlan Hobbs
Kimble Glass Company
Toledo, Ohio

Sirs:
. . . It has style, verve, content. Volume I, number one is a lusty send-off for a long and exciting future.
Norman Dolnick
Harshe-Rotman, Inc.
Chicago, Illinois

Regardless

Sirs:
I don't believe I've been more excited over the advent of a publication since "Life" made its historic entry, regardless of the fact that yours is a trade magazine.
Ralph F. Hansen, Manager
Marketing Department
Monsanto Chemical Company
Springfield, Mass.

Sirs:
. . . I have just finished reading this superb magazine from cover to cover, and I want to say I have never laid eyes on a more inspirational nor beneficial magazine in the entire field. It is a boon to all designers.

Once again, congratulations — and thanks for bringing out Industrial Design.
Jorene K. Freitoz
St. Albans, N. Y.

Interesting

Sirs:
You've done a brilliant job. My main joy is that you've put together a large collection of INTERESTING things—and they are shown in a way that is simple and which always clarifies what is being presented. I've never seen a first issue which didn't show the marks of the high forceps, but your first issue on the contrary looks effortless, and it's rich in ideas.
Bob Osborn
Salisbury, Conn.

Sirs:
I took the first issue home with the idea of thumbing through it with the speed I have gotten used to with other magazines, but discovered to my pleasure that it was necessary for me to read it quite thoroughly in order to get from it even a portion of the excellent information it contains.
K. E. Richardson
Stewart and Richardson, Architects
Portland, Oregon

Sirs:
I want to comment that it is our belief that this publication has taken a very fresh approach to the problems associated with present day industrial designing. We wish you a great deal of success in your new enterprise.
K. M. Miller
Manager of Engineering
Lear, Inc.
Los Angeles, Calif.

Sirs:
. . . What seemed to strike me most was the effective change of pace—in typography and picture treatment and color and theme variety, and everything else. For my money, that's a wonderful editorial characteristic which few publications achieve.
William K. Beard, Jr.
The Associated Business Publications
New York, N. Y.

Somewhere in your business...

in the making, the labeling, the packaging or the shipping of your product—you use adhesives....We operate on the belief that for each particular application, there is only one adhesives formula that can serve you best.

Somewhere near your business...

there is an Arabol plant or warehouse ready to serve you.

A nationwide organization of 10 plants and warehouses serving major users of industrial adhesives

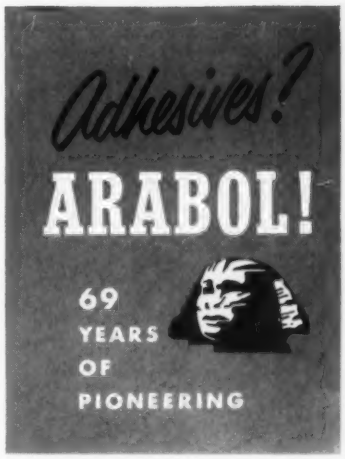
WHEN your specifications for a product include the use of adhesives . . . what is the value of the design if the adhesives do not play their full part?

When the identification of your product—through its labeling, packaging or case-sealing—does not carry through to the final user (through some failure in the adhesives) what happens to your total investment in design, development and production?

Arabol is privileged to supply industrial adhesives to the leaders in a hundred industries. In 69 years of pioneering, more than 10,000 adhesives formulas have been developed in our five laboratories.

The cost of good adhesives is low. It can hardly exceed 3% of your total packaging cost, for example. You can well afford adhesives made to your own specifications.

We invite the opportunity to submit samples for you to test in your own plant—under your particular working conditions—for your specific requirements, whatever their nature. That is the one kind of testing that assures you of satisfactory results. Your inquiry to Department 96 will bring a prompt response.



THE **ARABOL** MFG. CO.

. . . a nationwide organization serving major users of industrial adhesives

EXECUTIVE OFFICES: 110 E. 42nd ST., N. Y. 17, N.Y. CHICAGO • SAN FRANCISCO • LOS ANGELES • ST. LOUIS ATLANTA • PHILADELPHIA • BOSTON • PORTLAND, Ore. • ITASCA, Tex. • LONDON, Eng

APRIL 1984

If you took yourself a pie

about the size of the American economy, and cut yourself a wedge equal to all the things that are designed, or should have been designed, or could have been designed, you'd have quite a slice of pie.

Who *are* the designers that managed to get a finger in this pie? This is a ticklish question, but in view of our—and everybody's—stake in those designers, we shall try to give a realistic answer. The case of a can-opener may go like this:

The designer is the president of the company, who invented the product, raised the money to put it on the market, and took The Risk;

Or the designer is the president's wife, who has a Flair;

Or the designer is the president's son, a Harvard graduate who finds himself in can-openers but much prefers Kandinskys;

Or he's the chief engineer, who knows how to make things Work;

Or he's the sales manager, who has tested things and just Knows (in graph form);

Or he's an art school man who can slick things up to Please the Public.

So the president decides thus, and the engineer works it out so, and the sales manager says no, and the president's wife insists, and the president's son gives a critique, and at the eleventh hour the designer is allowed to add a few fleet-footed details of his own.

This is really pretty wonderful. The more people get worked up about design, the happier we are.

But a talent for designing can-openers is not, of course, a natural corollary of being a president; running a company is quite a job in itself. Neither does a spectacular sales record qualify one as a designer—an oracle is not necessarily dogged by a muse. The engineer knows plenty about design; he designs something so it works. But when he feels he must adjust working parts to a salesman's graph of a workingman's dream, he is likely to join his own opposition.

"Designing" a can-opener, or a building or a package can no longer consist of a last-minute flourish of pen and pastels; it is a serious business which works from the inside out, from the bottom up. It is more than enough to occupy a full-time person with training and experience—a professional. Whether he is a staff man, a whole department, or a hired consultant, he knows how to get along with the engineer, accountant, president, and public, too. We're for the professional.

We're for the president, too. He's 100% on the beam in his jealous regard for the design of the can-opener. So is his executive staff. They *should* care—if only because it's the surest way to get the best designer to do the best job; the surest way to be competent judges of the finished product; the surest way to get more pie.

Perhaps because they've found it pays in pie, more and more companies are admitting the designer to the inner policy-making circle. Which brings us full circle. Who IS the designer? The president and his staff each knows what *he* requires from the design of a can-opener; the designer knows what *everybody* wants, and how to give reasonable shape to this lump of abstract ideas. Ideally, then everybody gets into the act—in the role he alone knows best.

That is why INDUSTRIAL DESIGN is not written for designers only; or for design executives only. It is written for everyone with a rightful finger in the pie—may it mean more power, and more pie, to them all.—*the editors*

The nineteenth century
which invented
modern business
had to invent some place
for business to happen.
Thus the office.
Once invented
it had to be justified
which brings us to

THE CULT OF WORK

by Eric Larrabee

WHAT IS HAPPENING TO

Work became a cult with a dogma which endorsed the intrinsic merit of spending most of one's life in an office, of entering and leaving it punctually, and of observing while there a complex ritual of industriousness.

Offices were not the sources but the courts of industrial power, and—like any despots—they drew to themselves more functionaries than they had functions. In the absence of enough work to go round, work had to be invented: the typewriter, the telephone, and the filing cabinet followed inevitably. An enormous ceremonial of sanctified etiquette came to ornament the few actions of any consequence. It lent them plausibility, it prevented them from being taken precipitately, and it protected them from meddlesome interference; but it could not be torn down, it could only be enlarged. The one man who ever tamed an office was Henry Ford—he destroyed his entire statistical department, down to the last comptometer, in one afternoon. His like will not come again.

Little of this being reasonable or efficient, no sooner was it perfected than it began to be undermined. Today the code of compulsive workfulness, though it has set the style for much office organization and equipment, is more honored in the breach than the observance. The office has been subverted from the inside by the two classes of people who mainly occupy it, men and women — or, executives and secretaries. They have lost the faith, the former because it made life too difficult and the latter because they never believed in it anyhow. Accordingly the shape and character of the office has changed, away from an atmosphere of rigidly inhuman travail toward one of ingenious and graceful practicality. Offices have almost become fit to work in.

The interior disintegration of the old-fashioned office began when the men started to hide from it. Since its purpose was communication and control, mastering it consisted in mastering the flow of messages. The office's endless problem in keeping up with itself, and with other offices, was one of communication—that is, how to avoid being communicated with. The executives, traditionally entitled to deference, were able to take the first step in defending themselves against the office by retreating more deeply into it, barricaded behind a wall of secretaries through which only a limited amount of information could penetrate. The serenity of the inner managerial sanctum was achieved by surrounding it with rings of outer sanctums, where even the secretaries had secretaries.

To do the drudgery that men disliked but had to pretend was important, women were brought into the office on an ever-larger scale. At first, before the executives had disappeared into their custom-built cubbyholes, additional women could simply be poured into a common secretarial pool and disregarded. But with their deployment as delaying forces, they began to take on larger stature. Technology — in the form of carbon paper, mimeographs, and the dial exchange — had isolated the bosses but put their secretaries in total communication with one another (a state known in the theory of cybernetics as negative entropy, or The End). This made them essential and conveyed the fate of the office into female hands.

Within his nest, the executive was meanwhile trying to look as though he were not in an office at all. His first effort was to seem to live there. He added deep armchairs, a coffee table, and a bar — possibly an adjacent bath, with shower. Then he replaced his desk with a large table which had no drawers, imply-

World Wide photo

ing that he had no trivia to keep in them. Eventually — this has already happened in the upper echelons of the radio networks — the desk would vanish entirely and leave his office indistinguishable from an apartment. Anyone who entered would immediately perceive that this was a man, freed from mundane traffic with papers and pretensions, who had attained a state of pure function.

The secretaries' solution was almost the opposite — to change the nature of the office without changing its form. Sensibly realizing that too much male vanity was involved for them to challenge the Cult of Work directly, the women joined it — performing the stylized tasks of typing, filing, and answering phones with all the ardor of believers. They didn't try to make themselves at home in the office by converting its decor into an ostentatiously feminine one. They saved that for their dress, letting the neutral background set them off as flamingly individual temperaments to be reckoned with. Where men had by common agreement assumed a pose of businesslike calm and rationality, the women quietly monopolized the right not to have their feelings hurt. This shrewd maneuver brought temperament out in the open and allowed them, behind a smokescreen of energetic inactivity, to make the office really workable.

The executive was left with only the most desperate alternatives — he could join the office family as an equal or quit it completely. Unless he makes peace with "his girls," the very high executive is now truly independent only if he possesses an inner office but is never in it. To pass in his own right as a real operator, he must neither write nor answer letters but conduct his business verbally — if by telephone, then an unlisted one, preferably not his own. He has to adapt himself to an office inhabited by others with equal rights, or else move — like Mr. Baruch on his park bench— in the splendid self-assurance of carrying his spiritual office with him.

The office that designers are now asked to contrive is therefore no longer a simple citadel of bureaucracy. It is expected today to be a civilized environment —more civilized, indeed, than many of its occupants enjoy in their own homes. They are no longer expected to be tied to its desks; it must compete for their attention against coffee breaks and that greatest enemy of conscientious labor, the business lunch, which a generous government has seen fit to subsidize by exempting it from taxation. The office must prove itself in competition with the demimonde of the expense account—a dimly-lit universe of restaurants and cocktail lounges where the most pertinent affairs are increasingly conducted.

With the Cult of Work collapsing, the office is on its mettle—to provide for all ranks the perquisites of intelligent planning once reserved for the brass. For too long the secretaries have had to accept what they got, not because they particularly cared for it but because it was nice to know that the boss cared. No longer is it enough to design offices for them, as kitchens have been designed for cooks, on the basis of what men think women ought to want. The hygienic unreality of appearing busier than one is no longer commands respect. Where formerly the office society could be satisfied with sops—Beautyrest furniture in eye-ease green or paper of the finest Hammerhead Bond—it now demands a thoughtful and deliberate compromise between amiability and sense. Today, given the opportunity not to be ashamed of either, the office is called upon to be both an outpost and a refuge, where effort and relaxation need not be in conflict.

Stern and isolated strongholds of work

alker Evans photo courtesy Fortune

Key to this change is the desk. Once the sober roll-top was a complete office for the self-servicing executive. It held his papers, paper clips, and hat; he wrote on it, then rolled down the lid and locked up his thoughts for the night. A side chair held secretaries and callers alike. As office technology advanced, the desk ceased to be a tool and became a symbol: the larger its cubage, the greater the power behind it. In actual fact it was becoming obsolete. The boss' papers were now filed; his dates were in his secretary's head; if he wanted to say something to somebody, he pushed a button or addressed a dictaphone. The designers he engaged to produce ever-larger desks soon perceived that his real function was decision-making, and what he really needed was a place to hold high policy pow-wows in comfort. So the desk receded before the coffee table and a total atmosphere of easy communication, which is now both the proof of power *and* the useful environment for the revised executive as he really is.

With her rise as a responsible office power, the secretary needed space, drawers and knee room in quite new relationships. Though the soundproofed desk with one perfect lamp and two perfect tulips (right) began as a custom-made offering, the amenities of custom design soon filtered into mass production, and today anyone in the hierarchy can have just the kind of office he or she needs. Industrial methods have further healed the gap: interchangeable modular units are often arranged to suit boss, secretary or in-between.

The humanization of the office, from inner to outer sanctum, was started not by office suppliers but by firms who design a whole interior, which meant that furniture was usually wood. Now the cycle is complete: metal furniture manufacturers, formerly dedicated to the outer office, have found a way (see page 31) to make their wares worthy of the heretofore impregnable executive suite.

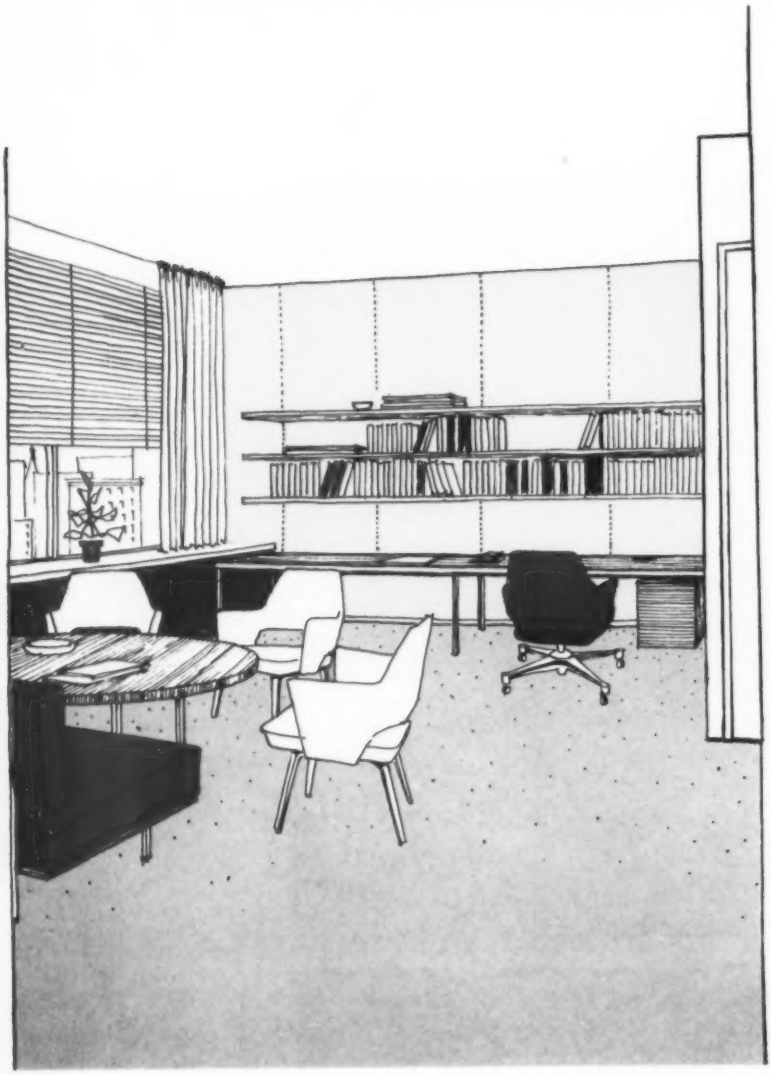
become amiable backgrounds for daily life

President's office,
Connecticut Mutual Life
Insurance Company;
Peter Fraser, Jr., designer.

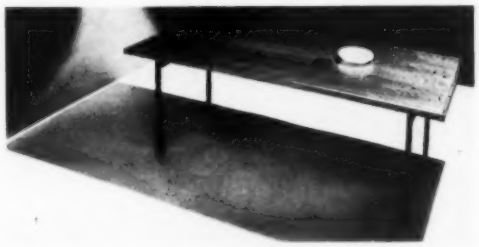
Secretarial corridor,
Webb and Knapp.
Designed by
Architectural Dept.,
I. M. Pei, Director

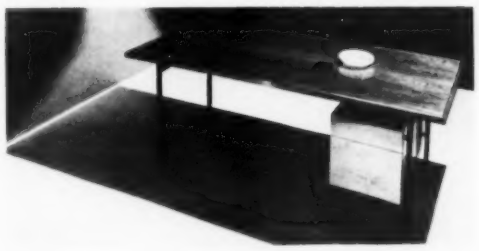
Ezra Stoller photographs

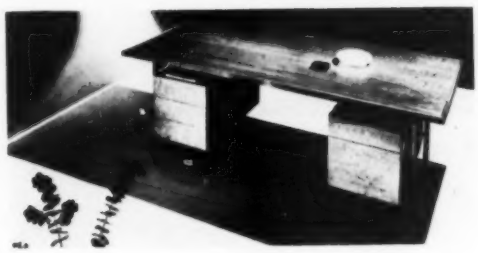
Sometimes custom-designed desks can be adapted to quantity



Knoll Associates' Planning Unit does pilot jobs like the executive office at the left. It found in this example that the boss' prime need was a conference table, and that he could use a long table top against the wall for whatever paper work he might do. Such designs can



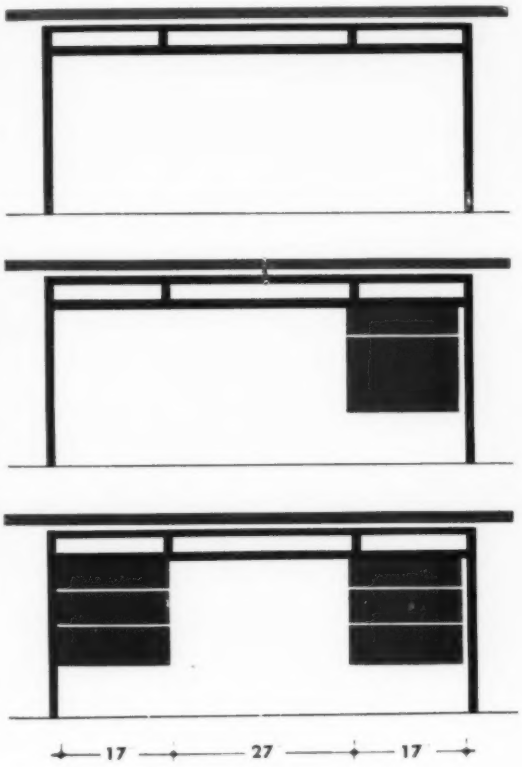


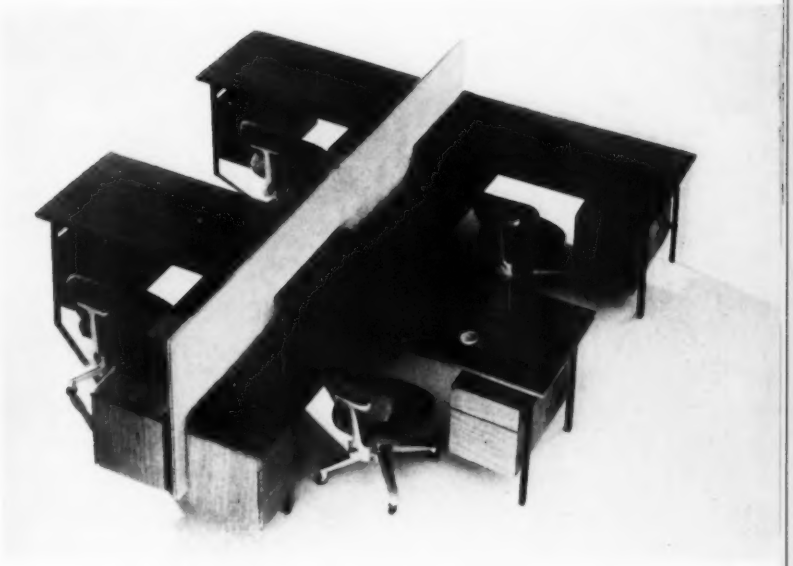


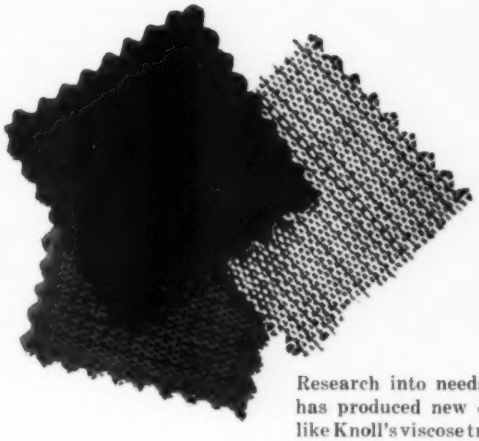
Jens Risom Design, Inc.'s comparatively few elements spring from a homefurnishings line, and are marked by fine woods and careful workmanship. Two frame sizes and several tops add up to combinations for executive or secretary. This desk, $498.

roduction on a modular basis.

often be translated by the furniture division into modular units to be produced in quantity, like those below. A variety of elements in birch or walnut can be ordered from a catalog, and with smaller tops can even be used by secretaries. ($550 per secretarial unit, incl. chair.)



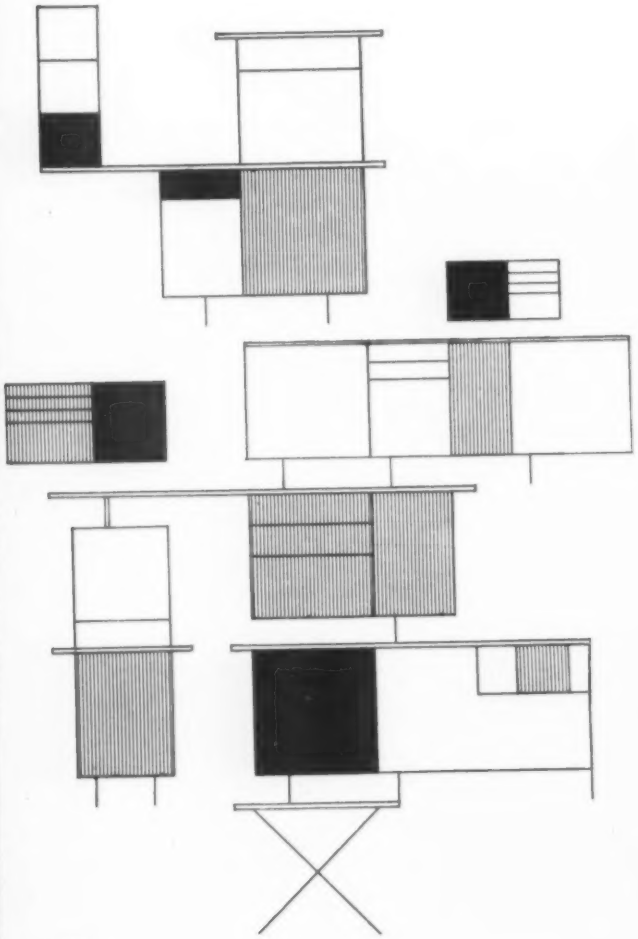




Research into needs of the new office has produced new colors and fabrics, like Knoll's viscose transportation cloth.

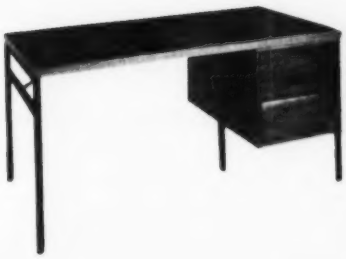
Large modular lines offer easy merchandising, combinations enoug for c

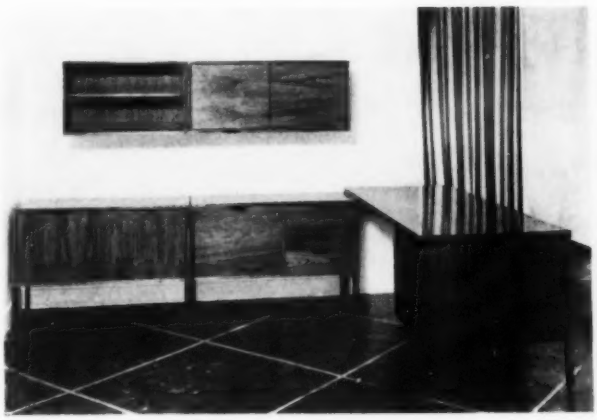
Lehigh Furniture Corporation keeps a large and varied line on hand by stocking components, assembling them as orders come in. Based on the simple metal base, drawer pedestal, and top, the units can be stacked, hung or combined for swiveling executive or the secretarial phalanx. Designed by Gerald Luss of Designs for Business. Price per single pedestal desk: $310.

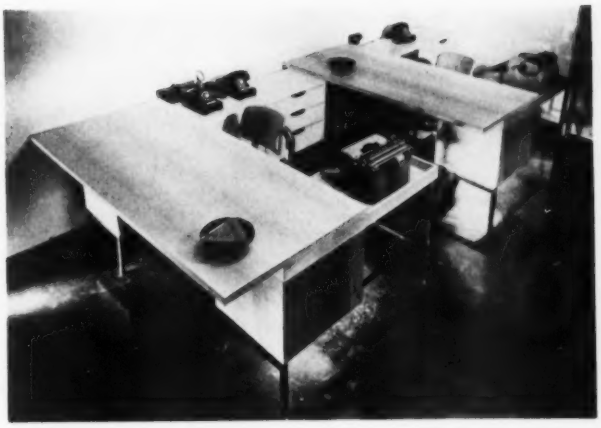


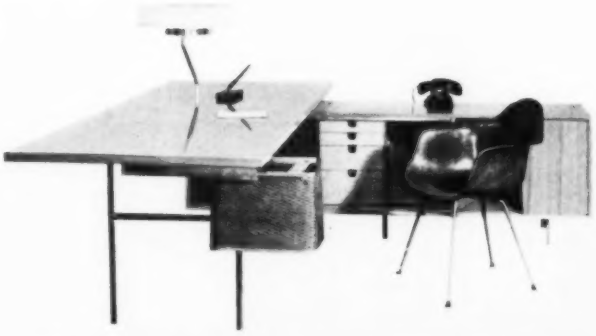
The Herman Miller Company's Executive Office Group combines a long low storage unit, a plain slab top and a typing table along with accessories like the "modesty panel" and hanging file. Each unit comes in a variety of finishes, with drawers, cabinets, openings, and legs in every possible combination, to be ordered from a chart. Designed by George Nelson Associates. $500-$900 per executive unit.

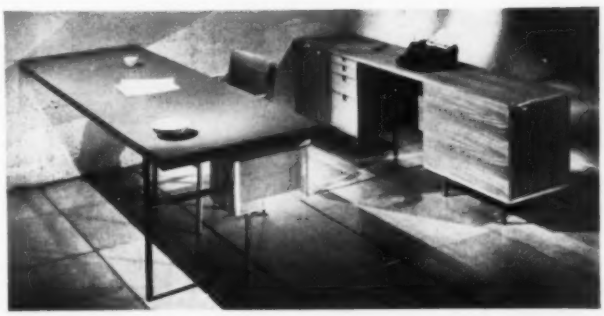
nough for complete inner and outer offices.



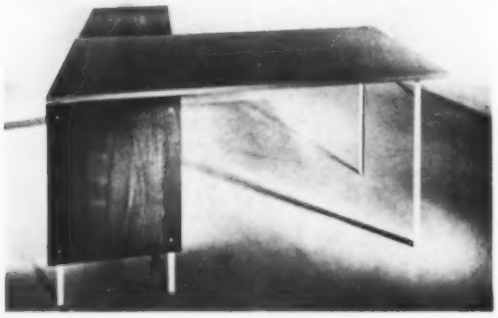


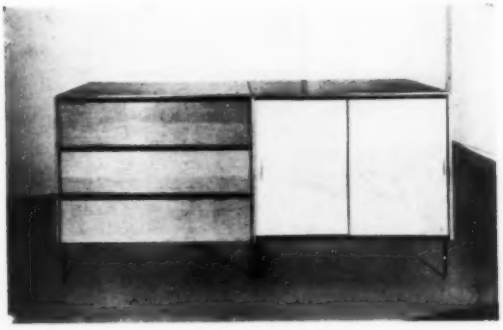




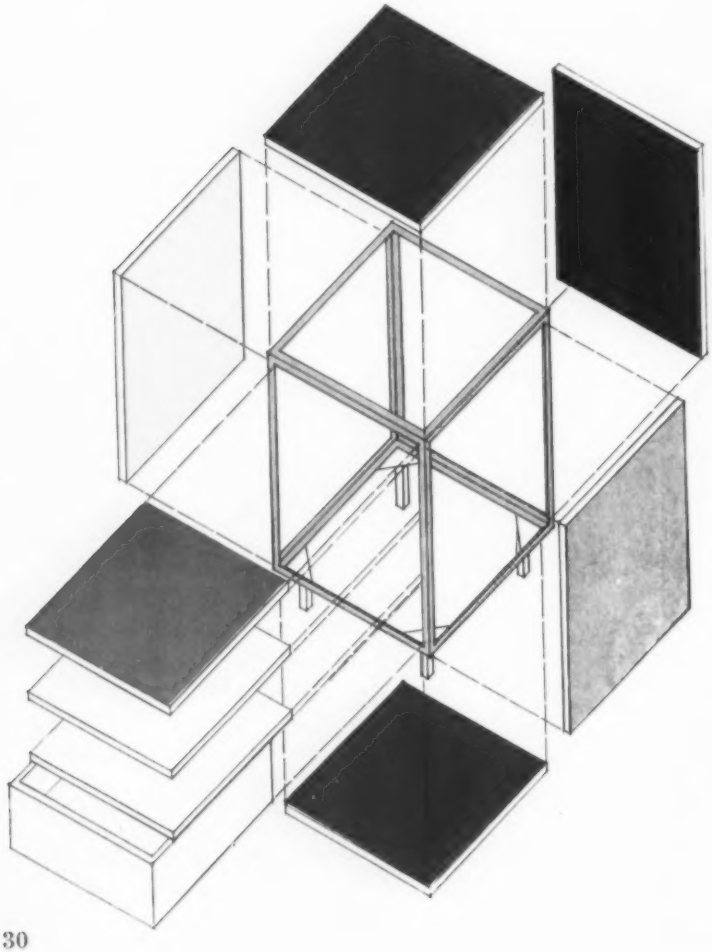


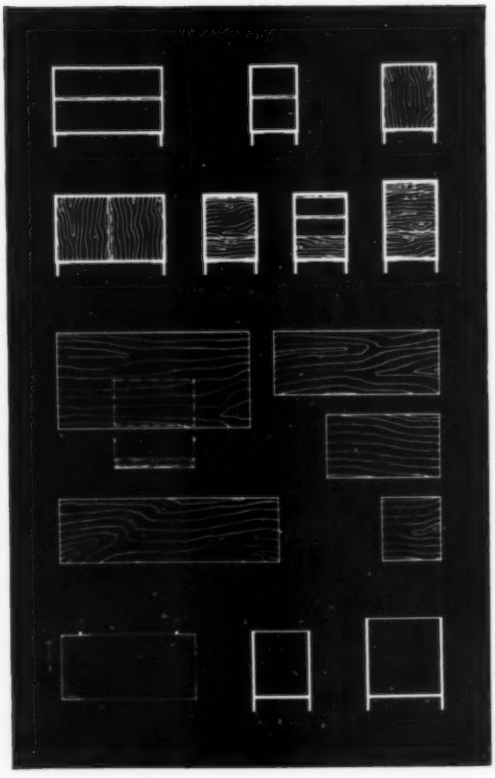
New mass-produced units offer all ranks the same basic equipment.

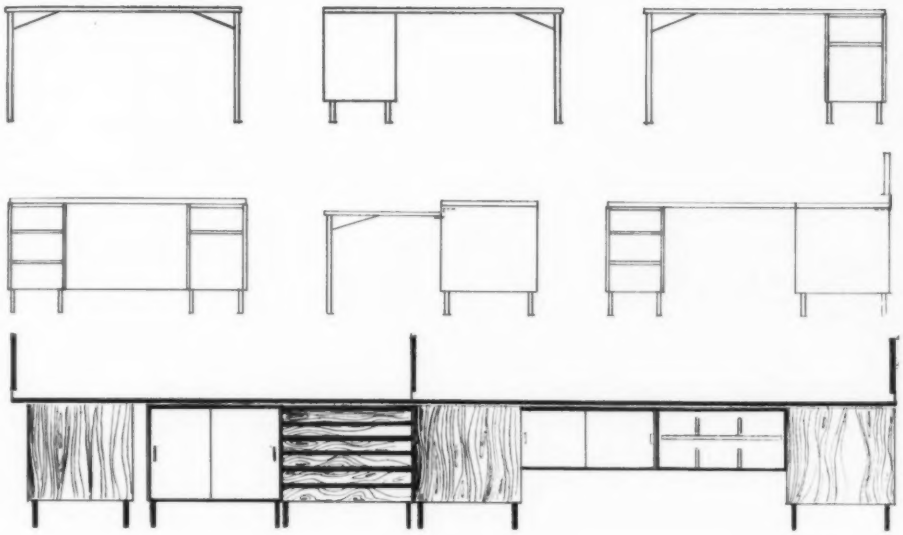




Orsenigo will introduce this desk-storage system, which is made virtually without skilled labor. Tops merely rest on supports; panels slip into formed-metal frames to make all pedestal units, hence need to be finished on only one surface and require no joining or edging. Only cabinetwork is drawers. Panels could be economy or luxury woods; frames might be brass for the Brass. Designed by Maria Bergson Associates.







Multiflex
Corporation's simple pin-on panel construction makes it easy to assemble desks and cabinets from warehouse stacks of infinitely combinable panels, L-shaped iron supports, and brass fasteners. Pre-drilled panels are wood; tops, plastic; acoustic partitions, plastic-coated burlap over fiber glass. Adapted from Norman Cherner's Studio Group design by Matthew Cooper. Price for L-desk, two pedestals, partition, approximately $350.

The boomerang: the outer office standby, steel, is dressed up and sent into the executive suite.

Globe Wernicke's
Executive Techniplan (as yet not unveiled) is based on regular steel Techniplan components. Glamor changes: black frame, new hardware, glass fronts, micarta tops, and a choice of color combinations. Designed by Donald Deskey Associates. Prices start around $400.

Milanese sallet, hammered from a single lump of steel. Weight: 6½ *pounds.*

Battle of the Nudes, *engraving by Antonio Pollaiuolo, ca.* 1470.

by Stephen V. Grancsay

MAN-TAILORED STEEL

Revealing the unsurpassed ingenuity of industrial design — vintage 1454.

Some years ago a fight was staged in New York's Central Park between a knight in chain mail and a knight in plate armor. Then a fully armored knight mounted a Squadron A horse and galloped around the park. He mounted and dismounted unaided, and both men wore armor for hours at a stretch without any unusual discomfort. That they were able to move at all, clad in sixty pounds of cold steel, is a tribute to the skill of a man who might be considered a medieval industrial designer—the fifteenth-century armorer.

The armorer's problem was to reconcile rigid steel with the flexible and inexorably active human body with all its joints, turns and, presumably, grace. This task of making a metal covering pliant, light *and* strong—he solved by breaking it up into plates. A Gothic suit was built up of over sixty plates, large and small, each varying from the others and graduated in thickness according it its function, and each lapping upward or downward over its neighbor. These plates were articulated by means of pivotal and sliding rivets (a rivet that moves in a slot) and, in the concealed area under the overlaps, firmly fixed by rivets to interior leather straps, never to each other. The result was as flexible and invulnerable as a lobster's shell.

Since plate armor was not only eminently functional but personally decorative, knights were quite willing to bear the discomfort of wearing it under all conditions, even in the heat of Palestine. Fighting in battle or simply as a sport was so important in the Middle Ages and the Renaissance that armor of the sort we show on these pages answered an almost daily need, and the industry it produced was as important in its time as the automobile industry is today.

The armorer, a highly honored member of society, was artist, designer, artisan and industrialist. Although the master himself usually forged the helmet, the trickiest piece, he had a staff to help forge other specific parts. Seusenhofer, Maximilian's armorer even invented a method for mass-producing thirty breast and thirty back-plates at once.

Metal was received in the form of a "bloom" or lump. This was beaten into ingots, and these in turn were flattened under tilt hammers to make plates of the required shape and thickness. Iron was welded to steel, so that the armor had a steel outer and iron inner surface. Much of the work was done cold, tending to compress the crystals and harden the metal. In the absence of rolling mills, this hammering was hard work.

The armorer's task was made doubly difficult by a limited knowledge of metallurgy. The quality of medieval steels varied. This was attributed sometimes to magic and secret miraculous processes on the part of the craftsman, but actually, apart from differences in the quality of the steel caused by heating and hammering, the quality lay in the ore itself. Innsbruck steel, with manganese in the ore, could repel a crossbow-bolt or a musket ball; iron from Shropshire was non-resistant. Milan, whose armorers procured their iron ore from the mines of Valsassina, in the mountains north of the city, had no rival in the manufacture of armor—the name alone was a guarantee of the highest quality. In fact, at that time, Milan laid down the law to all Europe on all matters of armor and dress (the word *milliner* today derives from Milaner).

It was not only the thickness of the plates that afforded the protection. The planes of the metal were so fashioned as to present glancing surfaces to a blow. Armor is not so heavy as one might expect, because the armor plates were graduated so that thickness occurred only where needed for protection. Thus a helmet might be eight times as thick over the brow as in the back, to protect the part of the head where the heaviest blows would fall.

An X-ray photograph of a man wearing a homogeneous harness would show its plates conforming to the bones and joints of the body. Like painters and sculptors, armorers studied the play of every muscle, the hinging of every joint—both human and in metal. Armor had to be engineered for light weight and for comfort. Thus its contours follow those of the slender, active human figure it was designed to protect, and its structure is based on the skeleton.

The knight expected his armor to fit as perfectly as his clothes. Gentlemen of the fifteenth century wore figure-fitting garments, and as the armor followed the outline of these clothes, fifteenth-century armor is more shapely than that of any other period, and free from grotesque ornament. So exactly was armor considered, that armorers made patterns similar to those used by tailors in order to get the true outline of the various pieces before beating the plates into final shape.

Though Gothic armorers were familiar with all the decorative techniques of silhouetting, engraving, embossing, gilding, damascening and inlay used on later armor, they rejected them in favor of the shaped steel surface and beauty of elemental line and form. In the interest of function, costlier armor was not even burnished, but blued or russeted, hence made relatively rustproof.

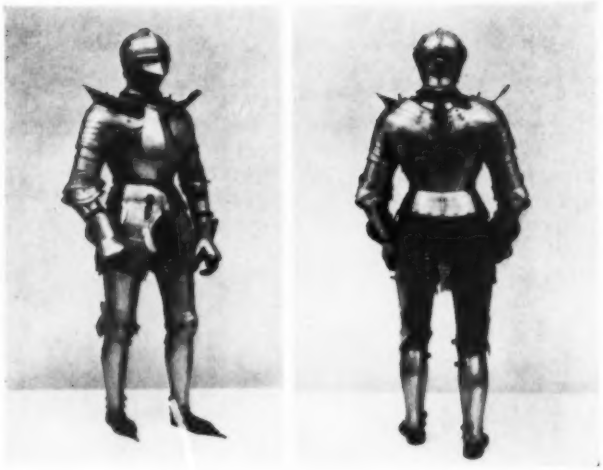
Today a machine can press out in a day more helmets than an old-time armorer could have forged in a lifetime, but even so a first master model must be hammered out by hand. When Army Ordnance studied helmets and body armor for modern warfare, it took over the armor workshop of the Metropolitan Museum (which owns these examples) to borrow from the unsurpassed skill and experience of the medieval armorer. With grace and ingenuity this master craftsman engineered and moulded hard steel into a living, flexible shell, as indispensable and utilitarian to the fifteenth century as jets and "rolling sculpture" are to the twentieth.

Protection *in armor was achieved by various combinations of head and body defense. Chain mail (left) was as supple as silk. Plate armor, like the cuirass (left), breastplate (center) and backplate (right) below, could be hammered and moulded to give an air of sturdy invulnerability, form fitting elegance, or could be sculpturally shaped to echo the folds of the dress beneath. Weight: mail, 15½ pounds; cuirass, 10; and breastplate, 6 pounds.*

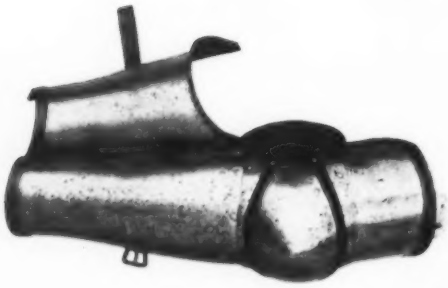
What looks like streamlining of these sallets was functional; the curved surface caused weapons to glance off. Worn by a mounted knight with mail hauberk and face defense (top af page), they show three constructions: vision slit in the skull piece, pivoted visor combined with reinforcing forehead plate, and vision slit formed by space between skull and visor.

The mid-fifteenth-century armet-a-rondelle is one of the most practical closed helmets ever devised. The skull, *with its keel-form ridge, continues to the neck as a vertical band over which the* cheek pieces close. *(These flap up by means of concealed hinge protected by flange on bowl when the* visor *is raised on pivotal rivet or removed by lifting pintle). Lower ridged edge of reinforcing* forehead plate *forms upper edge of vision slit. Flexible mail neck defense is sewn to leather band wired to helmet. The rondelle at the nape protected the base of the brain from a rabbit punch. Weight:* 11 *pounds.*

Straps to which steel plates are riveted are the inside secret of all plate armor. This example is French; the four above, Italian; the mail, German. Reinforcements and accessories: decorative rivets, intricately shaped buckles and hinges, and the adjustable removable lance rest.



Above and opposite: the man in steel. In full fighting harness, weighing 60 pounds, he was virtually invulnerable, yet as the kneeling figure shows, his movements were unhampered.



Movement:

Steel, ingeniously articulated by lames, straps, hinges, tongue-and-groove, and sliding rivets, accommodated the most active limbs. Clockwise, around the interior of an upper arm defense, are: arm, thigh-and-knee, left arm and lower leg defense (greaves), and a locking gauntlet. Worn over a leather mitten, it locked around a sword grip and could be opened only by sliding the rivet catch at the finger tip.

Kneeling: Federico da Montefeltro, Duke of Urbino, in a Milanese fighting harness; detail from a painting by Piero della Francesca.

DESIGN

Photo: Betty Rosenzweig

At the past convention of the Society of Industrial Designers, guest speaker George Nelson talked on the designer's responsibility to society. We feel that his comments may be of interest to everybody concerned with product design.

AS COMMUNICATION

George Nelson

Because we live in a society which has come to rely heavily on language as a means of transmitting increasingly complex ideas and instructions, we tend—quite naturally—to think of communication as a process rooted in the use of words. Yet even now, before the semanticists have quite solved the problem of how to make the same word mean the same thing to different people, we know that communication has to do with more than the spoken or written word. The after-dinner doodle on the back of a napkin is a communication. So are the night noises of traffic in a big city. The scrawled equations of mathematicians or physicists represent extreme compressions of fact and idea, communications which could only be matched by the use of huge numbers of words. The painting of the painter, the sculpture of the sculptor, the design of the designer—these are all communications of a sort, despite the lack of words, regardless of the intentions of their creators.

The one question to be asked of any communication is, of course, what is it saying. Sometimes the answer is simple enough, as in the case of the ubiquitous scrawls in public lavatories. Sometimes it is not: James Joyce's "Ulysses" had to be taken to court for even a limited interpretation of its message. When one comes to the activities of a profession, the communication becomes even more diffuse and the message less distinct, and we therefore tend to draw conclusions and form estimates based on the work or words of leading people. We may have a high opinion of contemporary architects because of the example of Le Corbusier, or admire the social conscience of physicists on the basis of a paper by Dr. Oppenheimer. Similarly, the status of design—as practiced by industrial designers—is established through a composite communication of both action and words.

I have conveniently at hand an example of the latter. In a recent statement to the press, one of the leading members of our profession stated that the major social contribution of the industrial designer lies in the new comfort and ease he has created for the public. About this verbal communication I shall have two things to say—first, that it is not true, and second, that if it were it would be of no particular consequence.

Before descending on this harmless remark and tearing it to bits, let us play with the assumption that it *is* true. Let us pretend to accept as a fact the proposition that the designer has brought a new degree of physical ease to society, and that this is his highest achievement. Having done this we can now attribute to him a status of a sort: we know who he is and why he is here. Just as an architect is around to keep the rain off your furniture, and your lawyer exists to keep you clear of lawsuits and the clergyman is there to ease the steep climb to heaven. In any organized society people have to do things for each other, and the esteem they enjoy depends on the society's evaluation of the services performed. In our society, of course, the degree of esteem can change with extreme abruptness. Ten years ago, as far as popular attitudes were concerned, the nuclear physicist and his activities were strictly for the birds. Today they enjoy an almost superstitious respect— and why not? Anyone who offers the prospect of unlimited wealth and/or unlimited disaster is quite a guy—or if you prefer, quite a profession. Obviously such a professional will find himself higher on the ladder of status than one who merely offers an increase in creature comforts. Nobody really cares anyway if the missile with the atomic warhead has been subtly color-styled by Zilch Associates to look its very best just below

Photo: Betty Rosenzweig

the ionosphere. The color of the bomb going off is prettier and has greater impact on more people.

However, if we do think of the provision of greater comfort and convenience as a topflight social activity, we have to find significant examples and see what the contribution of the designer really has been. When I say "designer" please understand that I am referring to people like ourselves who have an identifiable trade known as industrial design. And when I talk about comfort I am not limiting it to the feeling of a hot water bottle at the foot of the bed, but am including anything which makes the mechanics of existence simpler and thus releases time and energy (theoretically) for other pursuits. Thus the electric toaster might be an example. It takes less fussing than sticking a slice of bread on a fork and holding it over a fire. The refrigerator is a genuine improvement over the technique of putting a box out the pantry window in winter. Or radiant electric heating. Or express highways. Examples such as these have indeed changed our ways of living, but the trouble is that they are not the creations of industrial designers. One can find examples which are, but they are far less significant: secretary's chairs which won't snag nylon hosiery; more readable dials on dashboards and telephones; eye-saving colors on typewriters; luggage handles which are easier to grip; and so on. I am not trying to run down our perfectly useful activities—I am saying that I find no evidence to support the claim of a major contribution in the activity known as making life easier.

Jet-propelled super-comfort

As one considers this lack of evidence a question naturally comes to mind: why should the claim have been made at all? The obstetrician does not pretend to be able to straighten teeth, nor does the lawyer claim he can shingle roofs. Why this attempt on the part of the industrial designer to establish a position in an area where others are quite clearly the real contributors?

There is a reason for this particular choice, and I believe it may go like this: we are members of a society which appears to have given itself over to the pursuit of what might best be described as "super-comfort." Anything making life easier in this society is viewed with instant, total and unanimous approval. In fact, the very phrase itself has acquired the aura of something approaching sanctity. This trend, which since the end of World War II has become virtually jet-propelled, has alarmed quite a few people. The basis for alarm is that nobody can find an end to the trend. First we traded the horse and buggy for the car. Then the car was enclosed and the rutted roads were paved. A self-starter replaced the crank and electric lamps the acetylene headlights. Then came heaters and radios. The two-man top evolved into the one-man top and finally power took over, as it is now taking over with the brakes and steering. The clutch withered away. Pushbuttons make the windows go up and down and there is an extra loudspeaker behind the rear seats. And now—optional at $600 extra—there is air conditioning. Parenthetically, none of these developments as far as I know can be credited to the industrial designer. Anyway, we have the accelerating trend towards super-comfort, the alarm about a society getting soft and decaying, and the unspoken but completely solid public approval for the whole thing.

Pretense of social meaning

To the extent that he identifies himself with so formidable a social phenomenon, the designer is inserting a pretense of social meaning into his work. It is also a relatively low order of meaning, by which I do not mean that it is "bad" but merely that it is not especially significant as expressed.

A trend as conspicuous as the one under discussion might be viewed with the contempt which stems from imagined superiority. Actually, it is hard to view what is going on with anything other than amazement. Here is a society which is dedicated—on the surface at least—to the creation of a civilization of super-comfort. This is a society which through a volume of production no one could have even conceived a generation ago has taken the good old economic pyramid of the textbooks, with its handful of idle rich at the top and a broad layer of crushed proletarians at the bottom, and converted it into a diamond where the big purchasing power is spread over an enormous number of middle-class people. With money in the hands of so many who never had it before, why not a vast demand for television sets, refrigerators in which the ice cubes are made without trays, air conditioning and outboard motors? It is plausible that ownership of such conveniences does not represent the highest objective society has ever set for itself, but this does not make it vicious. There is nothing on record to indicate that Plato or Lorenzo the Magnificent lacked the best that could be provided, but both managed to give a good account of themselves in spite of their soft surroundings. Com-

fort as such—"making life easier"—has nothing intrinsically good or bad in it. The race from its earliest days has been engaged in a battle to extract an easier, safer and more entertaining life from the world around it, and we have carried this struggle to a rather spectacular point.

In pursuing his day-to-day activities the designer must deal often with problems of making life easier. This is absolutely inevitable in the society to which we belong. The manager of a supermarket has to deal with these problems too. His is a service occupation and so is that of the designer, and there is nothing reprehensible or degrading in the idea of service. Jesus viewed his activities in this light and so did the great painters of the Renaissance. What is significant about service is not the fact itself, but the infinity of levels at which it can be rendered. The average architect who draws plans for building developments operates at roughly the same intellectual and social level as the attendant in a filling station. Frank Lloyd Wright is also an architect, but there is a qualitative difference in the nature of the service he provides. As the centuries drift by, society forgets the bad plans, the ugly buildings, the jerry-built houses. But the rest it remembers—the good work of the good men—and architecture gradually achieves the status of a noble profession. In casting about for its own historic role, industrial design will always remain where it began: within the framework of a service profession. Its crucial decisions will be those dealing with the *level* of the service.

Like Buddha and Botticelli

Within the limits of his trade, the designer can be viewed in a variety of ways. We have already considered him at some length as a purveyor of comfort. In many quarters he is accepted as an adjunct to the advertising agency, or as an aid to merchandising. On occasion he is used to develop a new product from scratch: some designers have clients who depend on them to tell them what to make and how to make it. Or perhaps the designer is a kind of business consultant who has specialized in matters of taste. While all of these descriptions seem to me to be valid in varying degrees, my own view is that the designer is in essence an artist, one whose tools differ somewhat from those of his predecessors, but an artist nonetheless. I prefer this view because I believe it has to be true if the designer is to perform his service at the top possible level.

"Artist" is not a word to be used without risking suspicion in some quarters, and it is even possible that some industrialists might shy away from designers if they heard the word applied to them. This would not be the case if people really understood what a remarkable fellow this artist is, how extraordinary the survival value he has shown, and what remarkable influence he has had. It is a curious fact, and one generally ignored, that the least imposing occupations have frequently proven the most durable. If someone were to go to the trouble of charting those aspects of human activity which have endured the longest, and made the greatest impression on posterity, the results would be a shock to many people.

Take, for instance, the case of Buddha. Buddha was an aristocrat who at some point in his life quitted the ancestral palace and went to live in a cave where he promulgated certain impractical doctrines regarding man's relation to the world. Who remembers how much money Buddha's father had? Or the name of India's military leader of the time?

What we do remember is that Buddha has affected the lives of hundreds and hundreds of millions of people, that he did this by sitting in a cave and saying something once in a while, and that the name of his most powerful contemporary is not even a whisper. Buddha was not an artist—he was a religious teacher. What the chart would show is that religious teaching (philosophy if you prefer) is the most durable thing yet produced by mankind.

Or take the case of Botticelli. Botticelli was an Italian painter who painted women's faces as they were never painted before or since. Many people remember Botticelli and his pictures, but who can tell you the name of the political boss of Florence at that time? Or who had the biggest importing business in Venice? Or which city was at war with which, and who won? What the chart would show is that art is the next most durable thing yet produced by man.

The outstretched hand

Just what is an artist? We know he isn't a chap who starves in garrets. Matisse has pots of money, and plenty of non-artists have starved in garrets. We know he isn't necessarily a painter or a sculptor —D. W. Griffith neither painted nor carved, but he was an artist. My own definition may not suit you, but it is yours for whatever it may be worth: *an artist is someone who gives form to the essence of*

something. He is a purveyor, not of comforts, if you please, but of truths. You can always tell when his communication comes through because in the shock of understanding the message there is also the feeling that you had known it all your life.

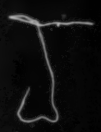
Consider an example of how this communication takes place within the framework of a society. In the early 16th century the Pope—was it Julius II?—decided to undertake the decoration of the Sistine Chapel. This decision was not an arbitrary whim: it was taken for granted at the time that the only proper way to treat an important interior was to decorate every available inch of it with murals and sculpture, and because of this there existed a whole series of service occupations, of which painting was one. Michelangelo was retained to do the job. Among the items in this vast mural was the figure of God reaching out to touch the hand of Adam, and so completely has this painting been taken over by the eastern world that today, almost 500 years later, even a detail of the hands is enough to identify the mural and its author. The communication established by Michelangelo in this painting is an exceedingly complex one and I do not propose to analyze it, but this much is evident—a job initiated to glorify a pope became, in the hands of a genius, an imperishable statement that man is not alone.

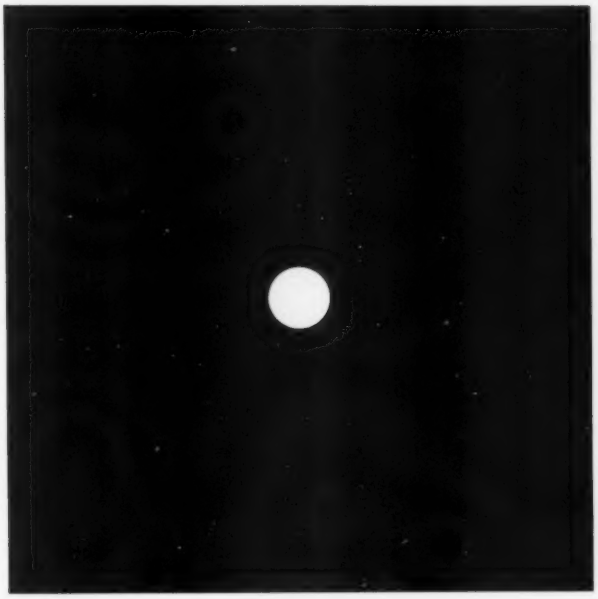
To assume the role of the artist means that the designer must concern himself with the essence of the problem he is dealing with, and this is extremely difficult. It does us no good to complain that designing a bathroom scale is a very different thing from painting the Sistine Chapel. Of course it is different. A ladybug is not an elephant, but the biologist does not despise it because it is smaller. Nor does it prove anything to hide behind the problems created by clients or production costs. The architects of French cathedrals had problems with clients and costs too.

Every design is in some sense a social communication, and what matters is not so much the importance of the object—this is generally out of the designer's control—as the emotional intensity with which the essentials have been explored and expressed. Truth is a most important quality in design of any dimension and people tend to recognize it when they see it. I have at home in my kitchen an automatic laundry, an anonymous white cube which gives no inkling of its purpose, and I find after looking at it for a couple of years that I have very mixed feelings about it. What I dislike very much is the visual evidence of the machine—I would greatly prefer having it out of sight, like a furnace. What I like and admire is that the designer did everything he could to reduce its visibility—its shape is the simplest possible and ornamental tricks are at a minimum. I get from this design a distinct sense of communication: the designer obviously believed that the washing machine should not be a prominent object and he did everything he could to say so. That he did not take the final step and integrate it into the structure of the house was beyond his control, and one therefore accepts the statement and respects the effort. In the automotive field one can find similar examples. All car design, today, is beginning to "go Italian." You can see the evidence in many recent British and American cars. What this means is that an Italian designer made a statement regarding the nature of the automobile which more and more people are coming to accept as a closer approximation to the truth than the work of other designers. Inevitably, this statement had an effect on the thinking of designers everywhere.

I chose to discuss design as communication, in spite of the fact that there are many ways to consider it, because this approach puts a maximum of responsibility on the designer. An important aspect of great art is that the artist has assumed total responsibility for communicating the truth as he perceives it.

This responsibility of the designer is to develop an artist's awareness of the modern world, and by this I mean a total awareness which integrates the outlook of the scientist, the mathematician and everyone else who is acting creatively. This world of ours has become a strange and explosive place where accelerating change seems to be the only remaining constant, where intangible relationships are more concrete than tangible things and where cooperation has replaced competition as the only possible technique for survival. Technically it is a world in which more is always being done with less, with the ultimate object of doing everything with nothing. It is our responsibility as artists in industry to make these things manifest, and thus to extend through our work a growing comprehension of the modern world. Until we learn to comprehend it, we haven't a chance of learning how to control it.





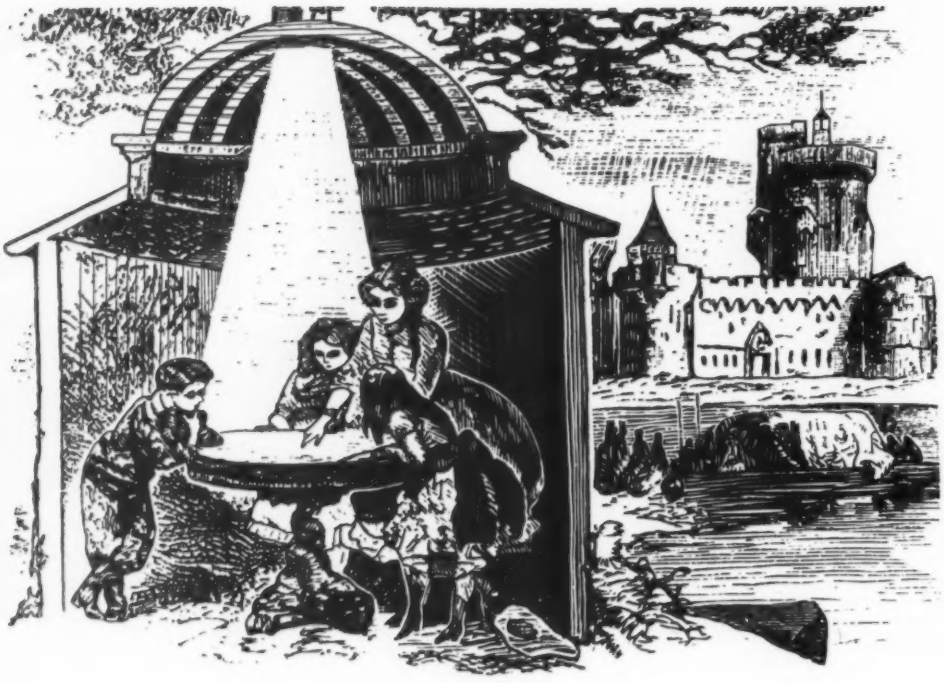
John Pile:

THE BLACK BOX

Our concept of reality is based primarily on what we see through our eyes. In our minds this reality is clear and full of detail, yet our eyes see sharp detail in only a small part of the whole field of vision; a part so small that we must shift our glance to take in the two dots of a colon at reading distance. Visual reality is actually a mental image, our eyes are merely tools that help to create it.

The ability to reproduce visual reality artificially is among man's greatest achievements, and the inventions that make it possible deserve to rank with language as fundamental tools of our existence on earth. Even so basic an invention as drawing is a subtle and complex thing. An animal cannot recognize a drawing, yet at some ancient date men learned to draw recognizable images of their visual world.

The ease with which we communicate visual images today depends on several later and more complex inventions, the first of which is linear perspective drawing. Modern men are trained to a system of realistic representation which requires that the world be shown from a fixed viewpoint at a given instant. This is obviously not the only or even the best way to look at the world, and the rules of perspective are so highly conventional that we have to learn how to understand perspective drawing. Nevertheless, its effect is so overwhelmingly "realistic" that since the fifteenth century it has been a principal element of the artist's technique, imposing boundaries that western art is only now escaping. This escape has been made possible, not only by a new set of standards, but also by the invention of a device that glorifies perspective, making it possible for anyone to produce correct perspectives of infinite detail with an absolute minimum of skill and effort. This is the camera.



The ladies in this garden summer house can enjoy the outdoor view inside. They see it projected in full color on the center table.

The esteem in which cameras are held today is out of all proportion to the use that is generally made of them. Instruments costing huge sums of money are bought to take a few dozen pictures a year of subjects that sometimes have little interest even for the photographer.

Objects which have a special importance to their makers and owners can often be recognized by the skill and attention that has been lavished on their design. Locks once received this kind of attention, probably because they represented an ultimate defense of privacy and property. Guns, when they were the final guardians of personal safety, received similar attention. Though both are now interesting only to a few collectors, cameras are the center of an active tradition of this kind.

It is probably not so much what the camera actually does in most cases as what it *represents* that makes it seem so precious. At any moment a camera can capture reality in both time and space, record the chaotic scene before it neatly on a roll for the photographer to take home and keep or destroy at will. Thus it acts as a kind of mystic device for controlling reality. The fetish image of the savage is echoed by the snapshots of the children in the wallet, the dictator's portrait on the wall, the ever-present news picture on the printed page.

The device that can control and package reality in this way earns the greatest respect, and any improvement that extends or assists its work is considered worth while almost regardless of cost. This attitude has produced such refinements of design that a good camera is an object worthy of respect quite apart

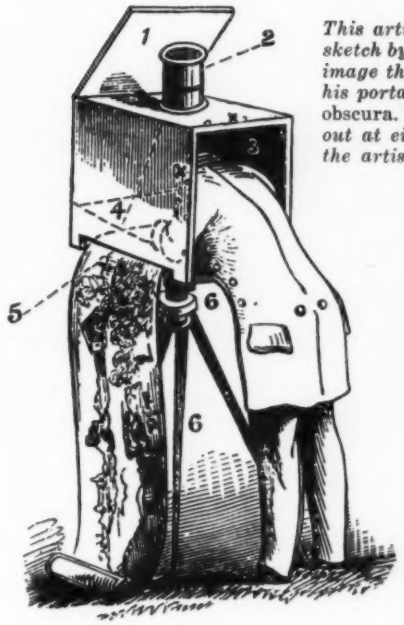
The apparatus of the wet plate photographer was effective although cumbersome. A dark room in a tent was a necessity for field work. An assistant was almost a necessity.

from the value of the miracles it can perform. What is more important, a camera gives the average man first-hand acquaintance with good scientific equipment, and suggests the quality of design and workmanship he could expect in his car, his stove, his chair, or his house if he took any of these objects as seriously as he does his camera.

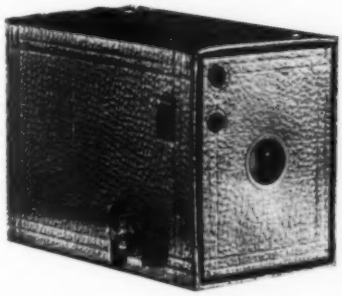
The basic theory of the camera is almost as old as perspective itself. About 300 B.C. Euclid observed that an image of the outside world could be cast on the wall of a dark room through a small hole in the opposite wall. This phenomenon was helpful in developing the first systematic methods of perspective drawing, but no one seems to have thought of creating images this way until lenses were developed.

The invention of the camera is generally credited to Giovanni Battista della Porta of Naples, who gave the name *camera obscura*, or dark chamber, to a room with a lens in one wall. The first portable *camera obscura*, was described in 1570 by the Englishman Boyle in his book "On the Systematic or Cosmical Qualities of Things."

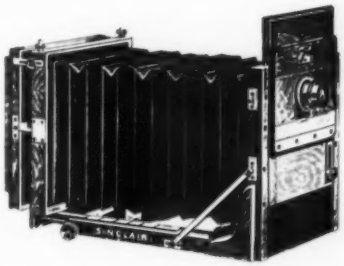
The *camera obscura* was a novelty that allowed the layman to look at the world in a new way. Fashionable estates of the eighteenth century often had a small, windowless summer house with a lens and mirror set in a roof turret to project an image of the garden outside onto a table .This image was of course, identical with the view to be seen outside, but the fascination of having it isolated from its normal context made such buildings popular. The garden camera was also an amateur drawing aid; a lady learning sketching could step into the *camera obscura* and trace a perspective on the table without troubling to learn the geometry involved. For the serious artist the *camera* was regarded as a useful tool.



This artist is making a sketch by tracing the image that he sees in his portable camera obscura. *The sketch rolls out at either side while the artist works inside.*



The classic box camera represents the ultimate in simplicity of design and operation.



The same direct design approach in the view camera produces the ultimate in versatility. In both cases lens and film and their mountings are the dominating elements.

Negative and positive

Photography in the modern sense of the word required the knowledge of chemistry that developed during the eighteenth century. Thomas Wedgwood was one of the first to outline the complete photographic process: in a description of the camera written in 1802 he told how to make a negative (on paper) and print it to make a positive. Only the fixing process was missing—his photographs blackened on exposure to light.

The camera became an instrument for making a permanent record of reality with the development of the "wet plate," a plate which, with moderate exposure, produced a negative that could be used to make a number of prints. Wet plate photography was at least as troublesome as the making of a drawing—a dark room (usually a tent) had to be set up beside

the camera, and as the engraving of 1870 shows, the necessity of loading the camera while the plate was still wet from the chemical solution made an assistant an essential bit of photographic equipment. Despite these difficulties, scientific dabblers enjoyed wet plate photography as a hobby, and a few men saw in it the basis of a genuine art—Matthew Brady's famous photographs were almost all products of the wet-plate process. The invention of the wet plate was so basic to the modern camera that the modern "view" camera is hardly changed in form from the camera shown in the engraving, although the dark tent and the boy assistant have been eliminated by the invention of the dry plate.

The basic elements of the camera, established with the invention of wet plate photography, are simple. There must be a lens and a place for the negative material, and these two elements must be held in fixed relationship with all light excluded from the space between them. Anything in addition to this is either a refinement or an accessory. A choice must be made, however, even in assembling these simple elements. If the relationship of lens to plate is fixed, the camera will record only a standard "correct" perspective, and a "correct" perspective is not necessarily the closest approach to the mental image that a camera tries to reproduce. In the so-called "view" camera adjustments of some complexity are provided to control the camera's interpretation of reality. It is possible to focus an object at different distances by moving the lens forward and back — the lens must be pulled very far out to approach a subject closely and drawn in to photograph a distant subject. The camera's perspective view of an object can be changed while the camera remains in one position by the use of different lenses: a wide angle lens fixed close to the plate makes near objects seem very near, distant ones remote, while a "long focus" or telephoto lens minimizes the depth relationships in the area being photographed.

The bellows, originally introduced to vary the length of the dark chamber for focusing, can also be used in shifting or rocking the lens so that angular and centric relationships are varied. If the lens is shifted from side to side or up or down the camera can be made to look in any direction while maintaining a desired set of perspective relationships. When the lens and plate are rocked so that they are no longer parallel it is possible to maintain sharp focus over the entire picture while manipulating the perspective in any way.

Although the photographs that result from such adjustments may show reality in ways that the eye never sees it, they often give a closer approach to the picture of reality that exists in the mind than a straight perspective shot. A high building, for example, may be shown tapering toward the sky or with its verticals rigidly upright, according to the way the photographer wants it to be visualized. The need for such complicated adjustments demonstrates the fallacy of thinking that there is one "correct" and realistic view of any scene. The photographer who uses the view camera finds that the choice in bellows adjustments requires him to select and reconstruct the reality before the camera just as the eye and mind do.

The Snapshot

The versatility of the view camera and responsibility it places on the photographer are very much at odds with the snap shooter's eagerness to snap his picture and get it to the drugstore for hazy, deckle-edge reproduction. The snap-shot camera was made possible by America's most important photographic invention, roll film, which was introduced in 1884 by George Eastman. Until that time the photographer had to carry stacks of heavy and expensive glass plates in his bags or loaded into a clumsy magazine built into the camera. Roll film solved this problem of weight and bulk in one stroke. But it was most important as the starting point for a characteristically American attitude toward photography. Anyone could buy and use the Kodak camera; as Eastman said, "You push the button, we do the rest." In box and folding form the Kodak permitted anyone enjoying a first child, a honeymoon, or a summer picnic, to be a chronicler of sorts.

Almost any camera can be analyzed as some sort of compromise between the simple and convenient box and the endlessly flexible view camera. The European attitude toward photography, even today, is more serious than the American one. The amateur photographer is expected to study his hobby, to master its complex equipment, and to set out with the intention of producing serious works of art. In general, American camera making has not departed far from the Kodak tradition, while Europeans, and more recently the Japanese, continue to treat the camera more as an instrument, less as a toy. Even in Europe, where the amateur is expected to be serious, the problem of incorporating reasonable flexibility in a camera that is compact and simple to operate has become the main stimulus for the design of better cameras.

As anyone can see in a camera store, cameras vary wildly in their shape. Yet all are a result of selecting from various photographic principles. Their over-all quality and the straightforwardness of their design is all the more remarkable in view of the fact that modern cameras are almost without exception de-

signed for the amateur. Since the professional market is not large enough to warrant special designs, professionals search among consumer products for those that meet their need by being extraordinarily versatile, serviceable, or merely durable.

The flexible bellows view camera, although it is only used in America by the most serious and determined of amateurs, is still the basic tool of the professional photographer. Speed and portability are about the only things it cannot offer. The most modern designs are all metal, but the time-honored construction of mahogany with brass hardware remains more handsome and more serviceable. In the hand camera, the bellows camera is made simple and rigid enough to be operated without a tripod. An example of this type, the Speed Graphic, is the standard equipment of the press photographer. An interchangeable back allows the use of cut film or film pack as desired.

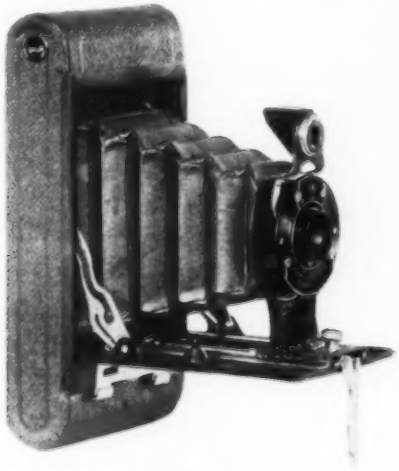
Although roll film requires that a series of pictures be exposed before the negative can be developed, it is used by amateur and professional alike whenever economy, speed, or the convenience of drugstore processing are more important than versatility. The folding roll film camera is similar to the hand bellows camera except for the typical rounded Kodak form dictated by the winding mechanism.

A vital accessory of the modern camera is a device that will permit the photographer to examine his picture before he snaps it. When all cameras were set up on stands the photographer inspected his picture on a ground glass plate before the sensitized plate was inserted, but hand cameras require a method that will show the picture up to the instant of exposure. A small optical reflector, a telescopic viewfinder, and open frames are among the devices that have been used on modern cameras, but with all these systems there is "parallax," the slight error in framing that results from the fact that lens and finder cannot be in the same place at the same time. Furthermore, the finder must be changed if the lens is changed, and there is no way of checking focus.

The most satisfactory solution to the viewing problem evolved from the mirror used on the *camera obscura* to throw the upright image on a horizontal plane. In the modern reflex camera the image is thrown onto a ground glass plate by a mirror that springs out of the way as the focal plane shutter is released. Thus there is no question of parallax, and the lens can be changed without any adjustment of the viewfinder.

Conditioned Reflex

Although the reflex system is a great convenience, its swinging mirror requires a large, rigid box as seen in the Graflex. The old Zeiss Mirroflex represents the most successful attempt to fold the reflex system; generally such attempts have bogged down in complexity and structural weakness. In the new Hasselblad the reflex principle is combined with interchangeable lenses and roll film in a self-contained magazine. The result is a highly attractive combination of the view camera's ground-glass focusing and interchangeable back with the portability and economy of the roll film camera. The twin-lens reflex camera uses an older and less logical solution to the viewing problem. Basically, it consists of two cameras coupled together, one for viewing and the other for photographing. On any logical basis this seems like a poor design for a camera: although it



The folding Kodak, archetype of the amateur camera in a typical, unornamented version. The body shape expresses the dominance of the film rolls clearly.

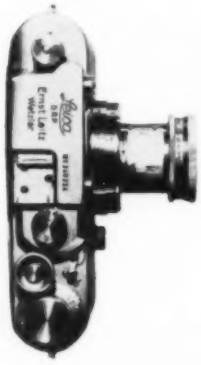
Zeiss, with Germanic thoroughness, produced this large reflex that would fold to a flat pancake, a triumph of ingenuity despite its completity and noise in operation.

allows ground-glass focusing and avoids the need for a mechanism to release the mirror, it reintroduces the parallax problem, doubles the cost of lenses, increases the bulk, and makes the use of lens accessories difficult. Nevertheless, one camera of this type, the Rolleiflex, is one of the most popular and satisfactory cameras ever built. This is partly due to the refinement and perfection of its mechanical design, which make the operation easy and circumvents most of the difficulties of a basically uneconomical scheme. A more important advantage may be the impossibility of making the Rollei fully adjustable or of loading it with accessories — the Rollei user can operate it as a kind of super box-Brownie, always confident of excellent results, whether he is an amateur or a professional.

The famous Rollei, the professionals' box camera and the amateurs' pro model is a straightforward form aside from the signboard-like label. The sectional view shows the odd but ingenious construction stacking one camera on top of another.

Entrance of the Miniature

Compactness and portability have always been important aims in camera design. Ultimately, the size of the camera depends on the size of the negative it must hold. All the cameras mentioned so far produce negatives that do not need to be enlarged. Although camera designers have experimented with small cameras for years, most early designs were conceived as novelties and disguised as pistols or watches or designed to take huge numbers of pictures on one roll. The first camera to take small pictures of good quality was the Leica, made in 1914 by Oscar Barnack. The Leica's lens was of such high quality that its 1" x 1½" negative, made on 35 mm motion picture film, could be enlarged to almost any size. The Leica was important for two other innovations. One was a range finder coupled to the lens so that distance could be measured and focus adjusted more quickly and accurately than on the ground-glass of view camera or reflex. The other was a rigid metal tube lens mount in place of the bellows. This interchangeable lens mount made the tiny Leica almost as versatile as the view camera. With the addition of a collection of superbly detailed accessories it was advertised as the "universal camera," a title which it fails to meet only because the parallel relationship between lens and film cannot be varied. This limitation, which no miniature camera has overcome, is the main reason for the survival of the view camera, and remains a major challenge to the camera designer.



The Leica is an extraordinarily beautiful object and a highly satisfactory camera at the same time. The combination of directly function placement of parts with extreme refinement of detail makes it an example of the style of good instrument making. Its maker seems to have learned how to adapt the vocabulary of the microscope to the camera.

The Leica of 1926 is basically unchanged today and is visually one of the most satisfactory of all camera designs. It is interesting that its layout is slightly asymmetric although it obviously could have been forced into a symmetrical arrangement. Viewfinder and rangefinder perch on top of its main box in a separate but well-related mass that suggests their secondary importance. There is no paneling of the

leather, no striping of the chrome; the only decoration is the knurling of the control knobs and the lettering of the dials. Beside it, most other cameras look clumsy, particularly the recent designs that use large ribbed knobs and more self conciously "composed" arrangements of parts.

Although the original objective of the neat design was maximum portability, the Leica seems to partake of the qualities of the microscopes and other scientific instruments that its manufacturer has made for many years. Like these instruments, the Leica has proved adaptable to a wide range of uses. With its vast complement of auxiliary devices it serves the amateur by its compactness, the professional through its versatility and directness of vision. It is used by scholars for microfilming and by scientists because of its adaptability to other equipment.

In every detail of performance the Leica is paralleled by the Zeiss Contax, and there have been arguments over the relative merits of the two ever since the Contax appeared. Although the Contax seems to be a more considered and sophisticated design, it lacks the Leica's pure directness. In spite of minor technical improvements other miniatures, such as the Kodak Ektra and the Bell and Howell Foton have never been as popular as the original miniatures.

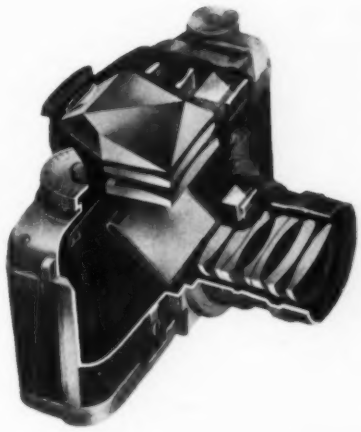
An effort to adapt the twin lens reflex idea to 35 mm form produced the Contaflex, a camera of startling bulk and complexity that never was popular. The single lens reflex system has produced the 35 mm Kine Exakta, which embodies many conveniences but lacks the assurance and precision of design of the earlier miniatures. A little known 35 mm camera from Switzerland, the Alpa, incorporates a range finder as well as a reflex viewer, allowing the photographer to check the ground-glass focus and making it possible to operate at eye level as well as from the stomach. It is an instrument designed in the scientific tradition, and its appearance reflects the precision of its mechanical design.

With the development of a new reflecting prism it has become possible for any small reflex camera to be used at eye level. This prism redirects the reflex image to the eye, reinverting it so that it is seen upright; thus the accuracy of ground glass focusing and the directness of eye-level viewing are combined. This has contributed a new housing shape to the top of the camera, which is built into the Pentacon and Rectaflex, an accessory on the Alpa or Exakta.

The Sub-miniature

In the 30 years since the introduction of the 35 mm camera, films and processing methods have advanced to a point where a 1" x 1½" negative is as usable as a 4" x 5" negative once was. Photo-engravers can now be persuaded to make color plates from 35 mm

The latest models of the Zeiss Contax are functionally almost identical with the Leica. The design is direct although the octagonal forms of the ends seem uncertain and faintly "modernistic."



The Alpa combines some of the directness of form of the Leica with a Swiss dream of mechanical ingenuity. Reflex and rangefinder focusing are both provided, along with most of the other refinements of its competitors. The price is high.

transparencies—a kind of final hurdle that suggests that miniaturization is no longer a problem.

The next step is obviously the perfection of the subminiature. Just as "standard" 35 mm film began to be accepted for still photography, 16 mm film became important for motion pictures. A 16 mm still camera was inevitable. A number have now appeared, some using standard movie film, others using specially cut film strips, and they seem to be repeating the history of the 35 mm miniature. Although many are novelties or toys in the guise of pistols, opera glasses, or wrist watches, others are serious instruments incorporating good lenses and ingenious shutters and viewfinders. Probably the best known is the Minox, which measures only 1″ x 3″ x ⅝″.

From the designers' viewpoint the interesting thing about these "sub-miniatures" is the fact that the film rolls and lens mount are too small to have much influence on the general form of the camera. In larger cameras the exterior form has always followed the interior structure, but a sub-miniature built in this way would be too tiny for human hands to operate. To make room for hand, eye, and camera controls, the over-all size of the sub-miniature must be extravagant in relation to its negative. If the Minox were enlarged to take a standard 1″ x 1½″ negative, it would be a foot long. In these tiny sizes, the camera envelope can be related to the photographer's hands and eyes, and film and lens can easily be tucked into the resulting shell. It is obviously harder to create a new form than to house an existing mechanism, and no imaginative form for the subminiature has yet emerged.

The tiny Minox, supposedly designed as a "spy camera" for Central European demand, is the first well-developed "sub-miniature." Shown here life size.

The Polaroid Land camera offers a new way of making pictures. The finished print can be lifted directly out of the camera only a moment after the shutter has clicked. Developed by Polaroid, designed by Walter Dorwin Teague.

One of the most adventurous of Kodaks, the Super 620, was designed by Walter Dorwin Teague in collaboration with Kodak engineers. The basic Kodak shape still exists here under a wealth of mechanical refinements, including coupled exposure meter.

Current problems

Other technical advances are taking place at an extraordinary rate. Any new camera design must be adaptable to these new developments or it will soon be obsolete. The survival of the view camera was possible largely because of its ability to use each new type of negative material—plates, cut film, film pack, roll film, color film and now Polaroid Land film for instantaneous processing. When xerography becomes practical (using electrically sensitized plates in place of photosensitive chemicals and thus eliminating the need for dark room processing), it will no doubt be adaptable to view cameras built in 1900. Cameras which strive for over-simplification at the expense of flexibility risk obsolescence when a new invention appears.

The American camera manufacturer faces a difficult problem. The techniques of mass production are best applied to simple and inexpensive cameras for the casual snap-shooter. The designer may be tempted to follow the precedent set by other indus-

trial products, such as automobiles, washers, or stoves, and assume that the buyer wants a maximum of automatic operation. However reasonable it might seem to make a complex device simple and foolproof, the photographer has a special relationship to his camera that is not like that of the average man to his car or stove. The classic "all-thumbs" amateur demands little in the way of performance and is best served by a simple box or folding camera without complex hand controls or delicate automatic devices. The Brownie market is the largest market, and the American manufacturer serves it well. The haphazard photographer who wants an inexpensive, sure-fire camera has the perfect instrument in some of the molded plastic box cameras with integral flash equipment. While their visual design is often weakened by half-hearted attempts to apply glitter or streamlining, their fundamental scheme is sound.

The serious photographer, however, whether professional or amateur, wants and enjoys the flexibility that comes with a maximum of manual adjustment. The camera gives a kind of symbolic control of reality that we rarely gain in any other way, and for the devotee there is nothing more satisfying than acting out the physical operations of controlling —the twisting of dials and throwing of levers. To have this authority replaced by a built-in brain would spoil the fun. The needs of the serious photographer are best served by imported cameras because the low cost of foreign labor allows the hand work necessary to make a fine scientific instrument. It has been the tendency of the American manufacturer to try to attract this group of camera users by the engineering of gadgets, but the gadget (which might be defined as an improvement that causes more trouble than it saves) has no appeal to the serious users of objects of any type. The continued unpopularity of cameras with built-in exposure meters (Contax 111), automatic exposure controls (Kodak Super 620) or automatic film advance (Robot or Foton) is striking. Even the famous Rollei with its automatic double-exposure prevention has been forced to make an "improvement" to allow double-exposure prevention *prevention*.

The great contribution of the American photographic industry has not been in the design of the cameras themselves but in the area of inventions that reduce the demands that must be made on the camera as an instrument. Roll film, high quality color film, infra-red film, flash bulbs, strobe lights, Polaroid Land film and the emerging xerography all overcome problems that once made certain kinds of photography difficult or impossible. These inventions all tend, in a characteristically American way, to favor the spread of photographic possibilities into the hands of an increasing number of camera users. Through a continuing series of such inventions we can expect to see the simple snap-shot camera gradually relieved of its limitations so that the huge mass of photographs taken every day may stand a better chance of becoming a lively and interesting documentation of our world. If this trend continues, the American photographic industry can allow its foreign competitors the comparatively small market for precision instruments that make maximum use of photographic materials. The vast majority of photographs developed in this country are snap-shots, and by concentrating on the snap-shooter the American manufacturer may well be supporting the most vital branch of photography.

The newest Leica, little changed from the earliest models, represents the achievement of European craftsmanship in camera-making.

New Anscoflex offers the amateur a sliding lens-protecting panel interconnected with finder hood. Of drawn metal with high-impact styrene fittings, it sells for $15.95. Designed by Raymond Loewy Associates. The flash Brownie may be passed up by the camera worshipper, but its ability to produce a picture in inept hands is extraordinary.

Take a market plus an idea plus a client plus a designer. Add a few children, multiply by a plan, divide by three steps and you have a

New equationfo

ion for the classroom

Designer Dave Chapman

The primer has turned into a movie projector; the "project" has replaced recitation by rote; the hickory stick has disappeared; but little free-expressionists are still riveted to the floor in military ranks. Although school architecture has improved radically, classroom furniture is usually almost as uncompromising as it was twenty years ago. At best, clumsy wooden chairs and tables have been designed for durability and maintenance rather than for vulnerable young bodies and spirits.

The Brunswick-Balke-Collender Company of Chicago, manufacturers of billiard and gym equipment, wanted to branch out. With $50,000,000 in public funds spent annually on school seating, and a growing crop of post-war school children, school furniture seemed a logical direction. So they asked industrial designer Dave Chapman to work out a development plan for them.

Traditionally, classroom desks and chairs have been constructed on the rigid architectural post-and-lintel principle. Brunswick's new line is constructed on an independent tubular steel frame, engineered to take shock and stress from any direction. This frame gives the chairs inherent structural resilience, while plywood seats and backs produce comfortable sympathetic contours.

Around this basic chair, which comes in a range of interchangeable styles and sizes, flexible modern classrooms can be assembled at any age level. The strong, light, pleasant-looking units adapt easily to individual desk work, group projects, group seating or play, because they were specifically designed for mobile, modern classroom techniques.

The following pages show how designer and client worked out this furniture, in a step-by-step system which might apply to any new product.—*m. s.*

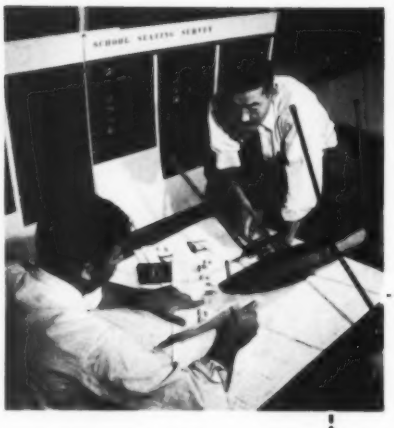
Phase 1: fact finding.

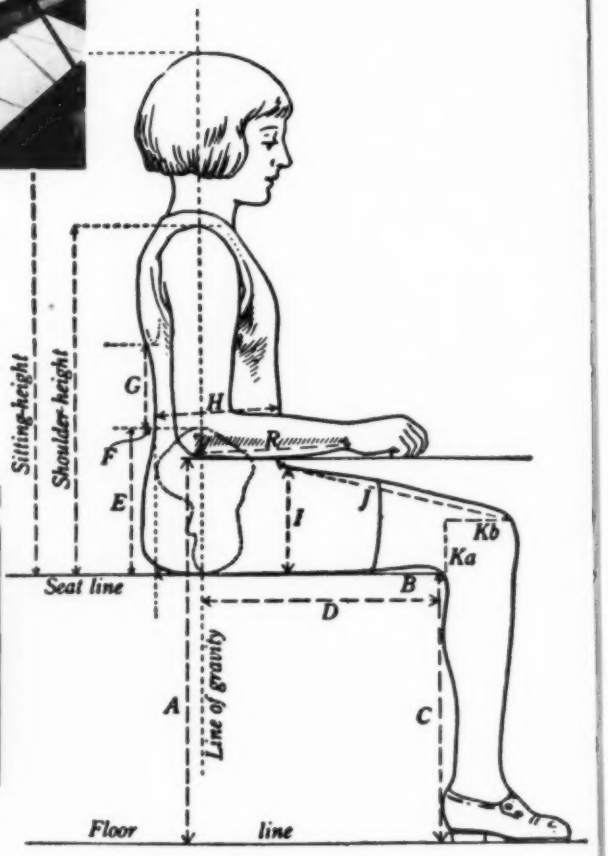
The designer's first step was to review the Brunswick-Balke-Collender Company's existing personnel and plant facilities. On the basis of this, he could draw up a thirty-five week work schedule for the client. As soon as the plan was accepted, a "design committee" was set up. This included representatives of Brunswick's management, its sales and engineering departments, educational advisors and, of course, design and engineering members of the Chapman office.

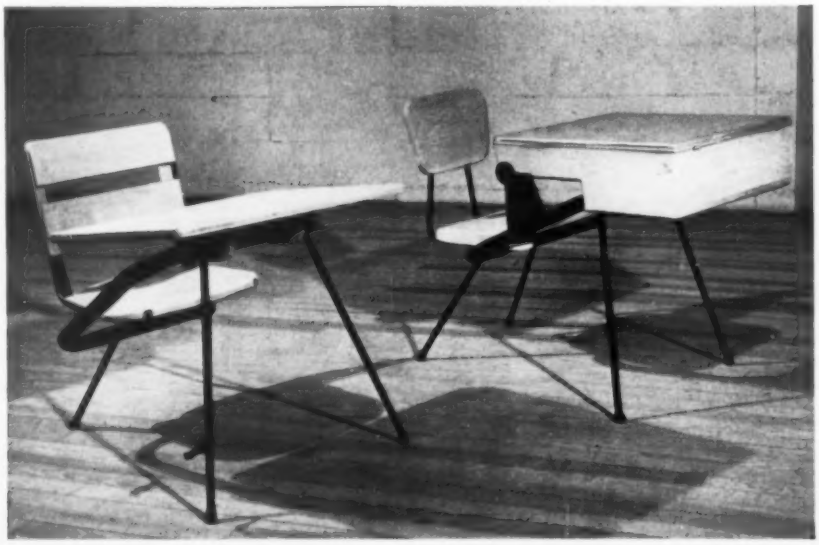
The team first surveyed existing school furniture. European correspondents sent reports on the latest developments in Germany, Italy and England; data about foreign and competitive domestic lines was projected onto charts, for easy study of their advantages and drawbacks.

Then came a thorough analysis of the function of school furniture. The designers studied orthopedic and posture charts to arrive at the principles of body support; they sent out 1,025 questionnaires to school administrators, asking about their needs and opinions. (Most of them voted for separate, movable units.) After this preliminary research had established a general direction, the next step was to tackle construction and materials.

Some sort of engineered metal construction seemed desirable as a natural contemporary expression. Since the post and lintel relation of seat and leg, used in wood, was as weak as its reinforced joints, it seemed logical to exploit the strength inherent in metal. With this idea in mind, both stamped and tubular metal members were tested (top photo), and the first rough models made up to try both construction methods. Either would have been financially feasible. The mock-ups themselves, though without any clear definition as designs, were a basis of design, strength, space and function research. It was the engineering stress tests which influenced the final choice of tapered tubular steel as the construction material. Time for phase 1: five months.







Phase 2: isolation of objectives.

With the design direction established, the individual units in the line (chairs, desks, tables,) were decided on, and a first set of prototypes was produced in the firm's Muskegon plant model shop from drawings done by the Chapman office.

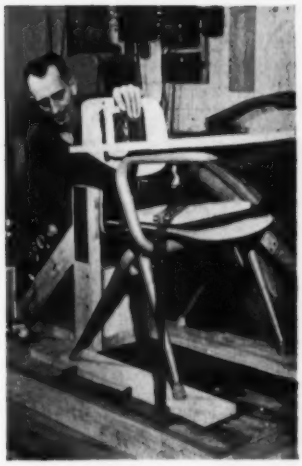
The development of a final form for the metal frame was the major design consideration at this point. After trying out many variations, the designers evolved a system of two square U's, formed from tapered tubes and welded together, which lean against each other in such a way that the impact of a body drives them more firmly together. This welded frame is entirely independent of the seat and back, which contributes to the chair's durability and resilience. The same U supports the desk, which means production economy.

The piece which holds the plywood back evolved from a hairpin to a square shape, and the method of applying the plywood parts to it also underwent changes. (Final method: expanding rivets and Phillips-head screws, easily removed by equipped janitor, not by kids).

Plant tests were constantly run to check materials and the engineered strength of each new variation. Even more important, children were given a chance to scribble at, scramble over and generally manhandle the furniture to see if it really was going to serve its purpose. At the same time, designers got a chance to check proportions, sizes, balance, and such details as the knee-room slant of the book box.

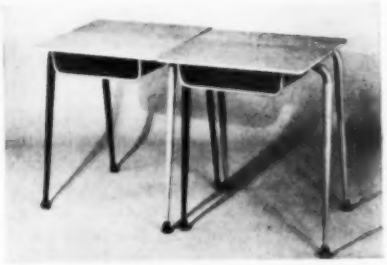
A second set of prototypes was produced, incorporating all these pre-determined engineering and design refinements and suiting them to the production equipment actually available. At this point the designers adapted the models to stacking and nesting.

During these first two development periods close contact was maintained between all branches of the client organization and the Chapman office, not to speak of the junior testers and a group of educational advisors who were especially helpful during the last weeks. Time for phase 2: three months.



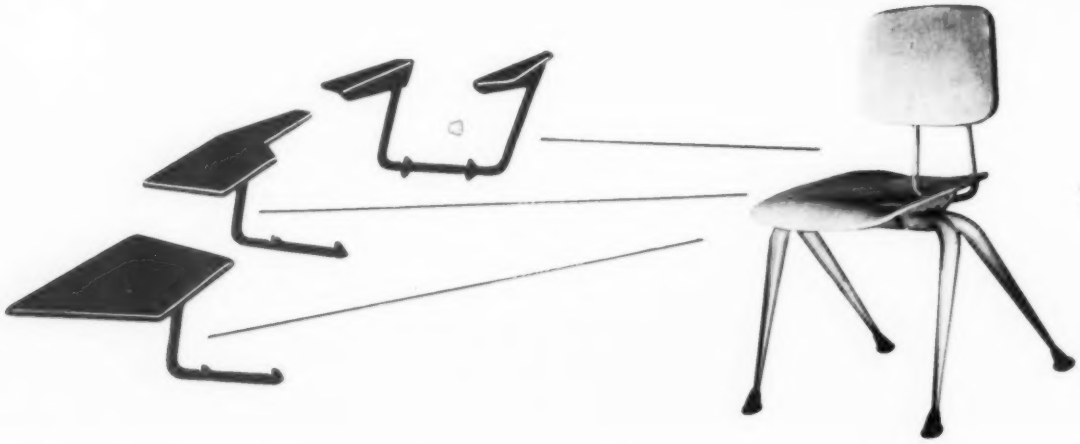
Phase 3: presentation to management and modification.

Nine months from the start of work, prototypes of the new school line were presented first to the client's management, and then to sales personnel. The entire line was shown in adult size, while several units indicated the intermediate sizes which could make the line adaptable to any classroom, from kindergarten to college. Based on the comments of Brunswick's management, engineering, and sales departments, the final choice of units and sizes was made, and the final revised prototypes prepared. When production costs were reviewed, for example, the teacher's desk (right) was way out of line; the final version (shown below it) is not only cheaper but integrates visually with the rest of the line. Similarly, the book rack changed from solid metal to bent rod.



Less than a year after the project began, a complete line of school furniture—11 units in a range of sizes and colors (chairs come in red, yellow, green, or natural maple)—was launched in a display (designed by the Chapman office) at the annual convention of the National Association of School Administrators. The designer's job was finished. Or almost: the school chair was so successful that this year the company brought out an adaptation, somewhat wider and more elegant, for home use (right, in blue).

Cooperation and planning resulted in a new kind of school furniture, based on a contemporary technique exploiting the strength and resilience of contemporary materials. To the children it offered comfort and a cheerful change from the old brown ranks. To teachers it offered flexibility in the classroom. To Brunswick-Balke-Collender, its minimum number of parts offered low labor and tooling costs and entrance to a new market. To the salesmen it offered a unique product, competitively priced in the quality market, whose interchangeable parts make it a practical long-term school investment.

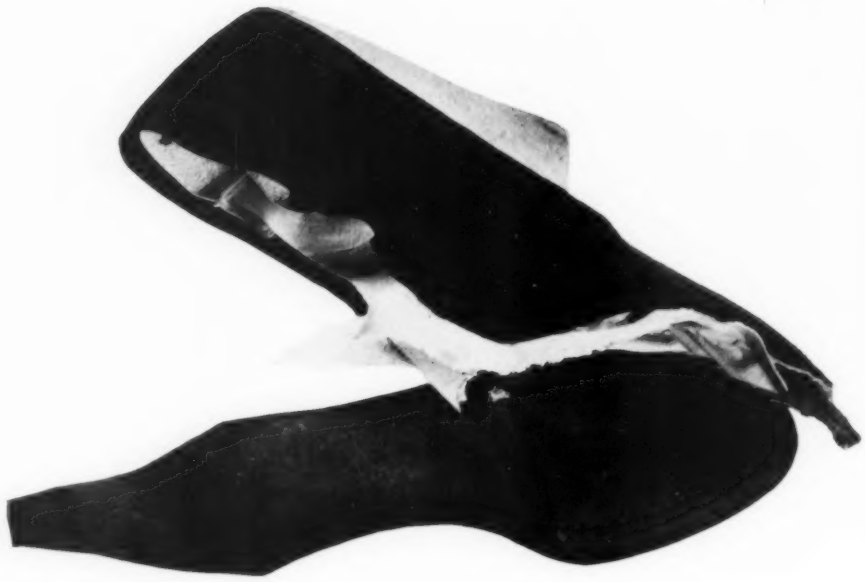


The versatile chair in action: high school (above) and grade school (below).

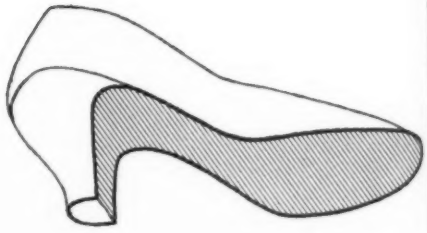
REdesign *some new ways to cross old streams*

The high-heeled pump, which has flattered so many shapely calves, is perhaps a sacred form and not one to be tampered with.

The trouble is that even the best-formed calves grow weary of lifting heavy, inflexible slabs of leather. Ferragamo of Florence is famous for his featherweight hand-made shoes, and fetches good prices for them here because he recently discovered the way to ultimate pedal luxury: a pump even lighter, more flexible, and better fitting. In place of the conventional one-piece sole which extends from toe-tip, under the instep, and down the inside of the heel (see sketch), the Ferragamo designs involves a split sole which is thick only where the foot touches the ground.



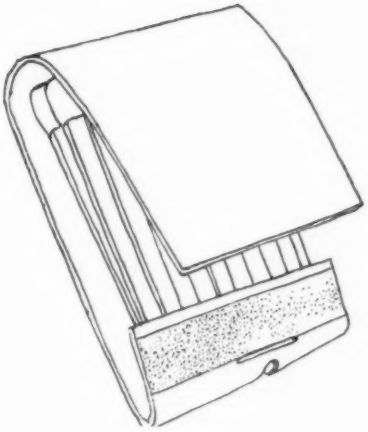
At the instep, the leather is split laterally (top), and half of it is cut away. Only the thin inside slice remains, and is metal-braced. The soft leather upper is then stitched to the fore part of the sole. This soft top piece then wraps completely around under the instep, gloving the arch, and the loose sole-tab closes neatly over it. The heel is an entirely separate support, also leather wrapped. Aside from the *chic* of the continuous leather casing, which makes the foot look slim and elegant even when seen at that peculiar angle which comes from crossing the legs, the design permits the break-point, where the sole ends and the arch begins, to be entirely flexible.



For centuries, it seems, people have been trying to decorate matchbooks in ways which would make their messages and names memorable to people who stuff them in their pockets and carry them home. The limitations of a 1½" x 2" surface have severely taxed the imaginations of matchbook makers and designers alike. Apparently no one, heretofore, thought simply of designing a more interesting and workable matchbook.

"Click-book" matches, said to be standard in Italy and specially made there for New York's Hotel St. Regis, combine all the virtues of convenience with nicety of form. The cover is one simple cut of heavy paper, curved at each end and folded just off-center around the frame of the matches. Because the two curved edges just overlap, and are stiffened slightly on the underside, they snap together or apart with the slightest pressure from two fingers.

The click itself is quite pleasing, and in the King Cole bar you find people sitting around closing and opening them, studying them and talking about them, and above all swiping them in gratifying quantities. There is a safety advantage to the design too: unused matches are always shielded from the match being ignited, and the book never hangs untidily open. Even in the usurper's pocket it snaps shut from the most nonchalant touch.

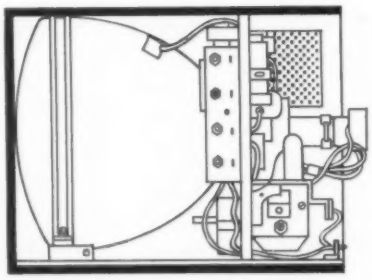


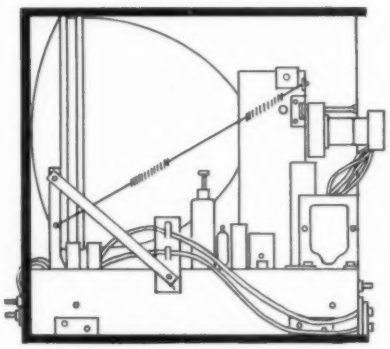
Predicting that color television will force black and white into the economy market, Avco Manufacturing Company has set out early to greet the trend. Crosley Division's new Super V was designed to produce a 17" picture with all the old contrast in a whittled-down cabinet (total weight, 53 pounds) at whittled down prices (the least expensive model sells at $139.95 compared to $169.95 for a pre-economy counterpart). This involved several technical developments and some design innovations that are interesting in themselves.

The major over-all change in the new Crosley is the compact vertical arrangement of the chassis around the tube, which allowed a whole layer of cabinet to be sliced off.

To cut the chassis to the space Crosley incorporated various simplified circuits developed by competitors and added three combination tubes of its own: a video amplifier-synchronization separator; an IF amplifier-detector; and a sound IF-synchronization limiter. The new chassis uses a new low of 15 tubes to compete with the standard 18-tuber.

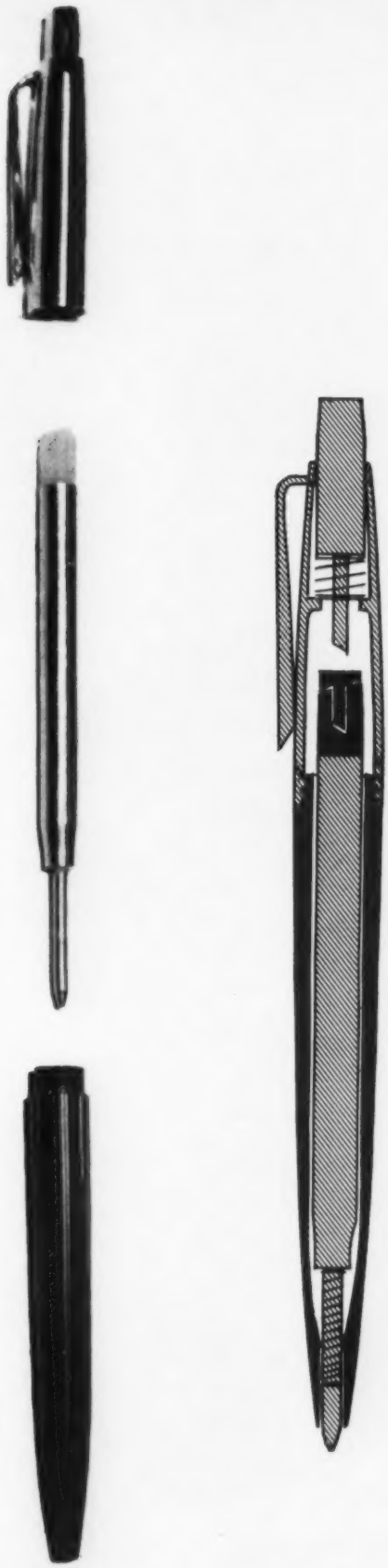
The front trim of the new cabinet is wood, but sides and top are wood-grained masonite. Controls are stripped of glitter and moved to the side, where they give less interference and may prove more convenient. Although the chassis is unusually available, the cabinet was designed to lift off in one piece for major repairs.

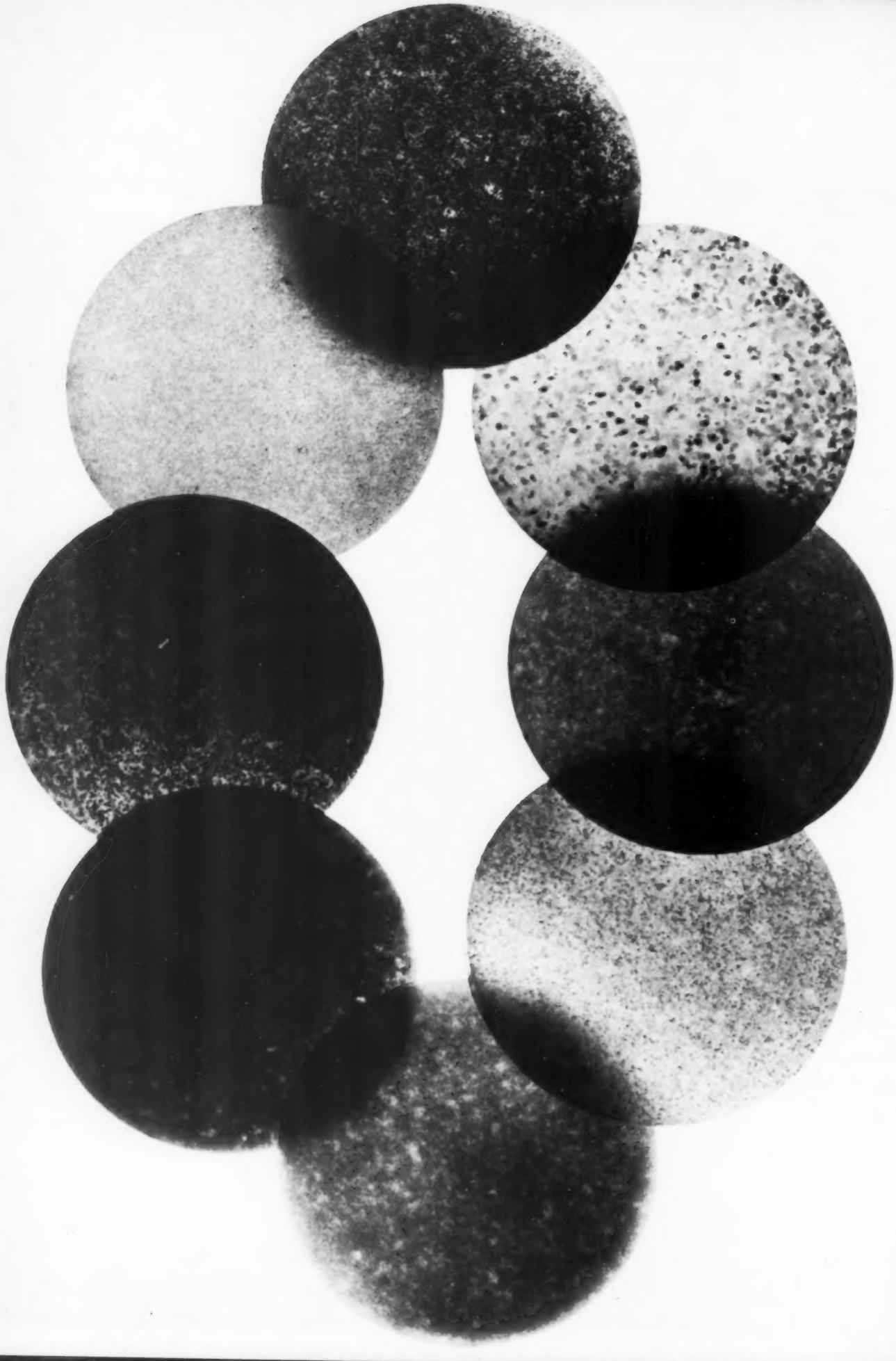




Parker Pen Company thinks it has done more research on ball points than any company in the land, but Parker has proudly hung back while its competitors flooded the country with enough ball points to equip nearly every man, woman, and child twice over. Parker made its decision against a possible "fast bulge in sales and profits" during the war because it didn't want to attach a good name to an inexpensive, disposable writing instrument. This spring Parker introduces a ball point that it feels is worthy to write the company's signature. The Jotter comes in three point sizes. It was designed for long wear and is supposed to have five times the "write-out" of an ordinary ball point.

Ball points are often made with a separate cap, but a retracting point is handier if it works well and leaves space for an adequate cartridge. Parker chose the retracting method and made it a lifesaver: since uneven wear is a major cause of ball point failure, the retracting system is devised to rotate the point 180 degrees each time it is used. The ratchet, which must be tough, smooth, and silent, is nylon. Nylon was also used for a barrel that would squeeze between the .250 diameter of the extra-large cartridge and the .380 recommended as the ideal writing grip by a University of Wisconsin handwriting study. Interior, Edward Grumich; exterior, Nolan Rhoades.





Experimental stoneware compounds by Russel Wright

plastics on the table

There's not much question that plastic dinnerware is here to stay. The real question is, who is it going to stay with, and what are their terms?

The most important dinnerware compound, melamine, is supplied by two major companies, American Cyanamid and Barrett Division of Allied Chemical and Dye, to seventeen molders who generally agree that business is great. Exact figures are not on record, but an informed source estimates that annual retail sales are now in the neighborhood of $25 million.

So far, it seems, most of these millions are spent to buy plastic dinnerware for special tough assignments, for patios and picnics, or for everyday use in a house full of children. Although department stores are switching plastic dinnerware from housewares to china and glass, apparently it hasn't replaced china in the home. Plastic dinnerware seems to serve as a sort of permanent paperware, taking routine duty so that the full set of china plates will still be intact when twelve come to dinner. But what a difference one person can make! If thirteen come for dinner they'll probably eat off paper. This isn't a country for second best. The company parlor is out-moded, and Sunday is more and more like every day. If paper and china are dignified enough for company, plastic should be too. And dignity is largely a matter of design.

There are plenty of arguments against plastic, of course — as there are against most materials. Generally they have to do with quality, but there are also some practical problems: although plastics are sanitary enough to be approved for institutional use, even the best of them have been criticized as liable to scratches and coffee stains. Such complaints may someday be solved by the plastics engineer, but they might be solved without him. After all, silver scratches, wood stains.

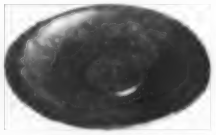
The matter of quality is more involved. The properties that make plastic perfect for the mess hall or the mountainside are just the qualities that seem to make it unsuitable for dinner in state. It's so light that a busboy can carry comical loads, and if he falls and breaks his neck, the dishes simply bounce. Plastic molds so perfectly that every piece is identical. And until recently it was immune to two-color decoration. None of this implies quality by traditional standards. Neither, for that matter, does a display of imitation china withstanding hard knocks. How do you imply quality? Perhaps the best way is to write it into the design.

There is no reason why the dinnerware of the future *has* to be plastic. Ceramic, wood, metals, and glass are all good materials, and perhaps paper plates are more akin to the American way of life. But plastic has come a long way in less than ten years. How much further it goes, as far as we can see, depends a good deal on design.—*d.a.*

United Air Lines meal trays.

Prolon Division, Prophylactic Brush

Experimental dinnerware compounds by Russel Wright



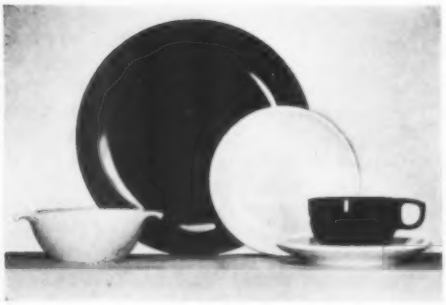
Devine Food pre-war line

From the mess hall

The institutional beginnings of plastic dinnerware didn't help its prestige much, but they did allow certain practical problems to be solved before the public's taste became an issue. One of the first people to work on these practical problems was apparently Jim Devine of Devine Food, who determined to produce a line of dishes in the plastic material used for military trays. For the most part, the Devine line of plastic tableware is the simplest answer to old problems, but it also tackles a few new ones.

One big difference between plastic and ceramic is the accuracy with which they can be shaped Ceramic dinnerware may go into the kiln with righteous uniformity, but it slumps and warps under the heat, and only experiment shows how to approximate a given design. Tolerances between cup and saucer or bowl and cover must always be loose, planes are likely to sag, and even under optimum conditions rejects may run as high as twenty-five per cent. A degree of variation in the finished product is not considered undesirable—it is a characteristic of the material, and centuries of tradition have produced shapes that bear change. Plastic, on the other hand, comes out of the mold with absolute perfection, which again is not in itself undesirable. Perfection presents certain advantages and certain problems.

Since any irregularity which ceramic might lose in the kiln will be emphasized by repetition in plastic, plastic molds demand geometric perfection of shape. Certain problems which have always been solved by warpage, such as the vacuum that can trap dampness between two plates stacked wet, must be solved by design. The Devine designs introduced the idea of a serrated foot to break the vacuum between plates, cups, bowls, and saucers. Tiny jogs molded into the cup midway up the side allowed it to stack straight without blocking circulation. Another innovation of the Devine designs is the male-female relationship of cup and saucer. The foot of a ceramic cup rests in an ample well. Instead of a well, the Devine saucer has a platform which fits accurately into the cup so it cannot slide. This novel idea, uniquely adapted to plastic, has recently been resurrected in the line designed by George Nelson Associates for Prolon.

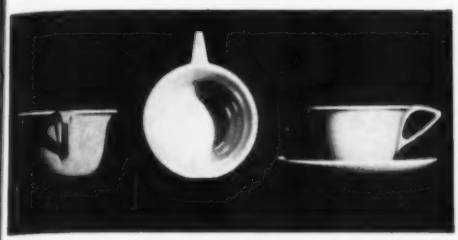


Lifetime Ware
Watertown Manufacturing Company (1947)

To the dining room

The first effort to give melamine tableware some style was made by Russel Wright, who was hired by American Cyanamid in 1945 to demonstrate the possibilities of the new medium. Mr. Wright rendered sound principles in the suave lines that he feels are a proper expression of the molding technique. The stacking jogs were smoothed into one ledge, and

Top: American Cyanamid prototypes by Russel Wright (1945)
(now made by Lapcor Plastics with slight variations, below)



Suburban by Wilbur Henry Adams
Applied Plastics Division (1953)

the cup handle was smoothed into the top of the cup. The plate was provided with a raised double rim to make it easier to pick from a pile.

Russel Wright's demonstration line was more than successful. A number of molders accepted Cyanamid's invitation to develop their own institutional lines from it, and within a few years several unexpectedly decided that unbreakable dinnerware would be worth the price to the public. The first consumer line, Watertown's Lifetime Ware (opposite), shows some of the details that became tradition in these early years. Rims are kept thick for strength, but they are smoothly turned over so that the parting line of the mold is unnoticeable.

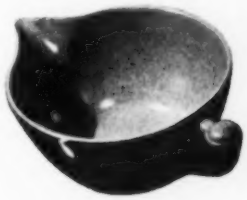
El Capitan—Texas-Ware
Plastics Manufacturing Company (1952)

The big problem

Most of the practical problems of plastic dinnerware are easily solved and do not interfere too much with the designer's search for pleasing shapes. The cup is an exception. The ceramic cup is a bowl, and the handle is only a fillip that decorates its side. But the plastic handle is a thing of substance formed integrally with the cup. The cleanest way to form it is around a core pin that retracts to release the cup from the mold. A handle produced in this way is especially uncompromising because it has its own axis at right angles to the bowl. The core can be enlarged to make a thinner and more graceful handle, but the effect of a loop of clay can only be achieved by other techniques. One of these is a divided female mold. This leaves a mold mark all the way around the cup, and it is fortunate that the method is only used in less expensive lines. A ceramic-like handle can also be formed with two extra pieces, usually inserted by hand. The result is shown at the left.

Consumer Reports

Cup made in four-part mold (unfinished).



Color-Flyte
The Branchell Company

Spaulding Industries, Inc.

Ideally, flash lines should occur at corners and avoid finished surfaces. Thus the cleanest way to make a handle is to run its top surface smoothly into the rim. This form may not please the designer, however, and it usually displeases the manufacturer because it means the flash around the rim cannot be cleaned by turning the cup. It is now customary to drop the handle, even though this leaves two small mold lines between the rim and the handle.

The core pin handle is more than a design problem—it is a manufacturing nuisance. It means extra worry and extra mold wear. This raises an obvious question: must the plastic cup have the traditional looped handle of the ceramic cup? Two alternatives have been tried. The unpierced, knob handle has generally been given up in favor of the core pin, in the belief that the public favors the old fashioned handle. A pony-tail handle can also be made in a simple mold. Though vulnerable, it seems like a logical plastic form.

Cup made in two-part mold

Desert Flower, by Joan Luntz
International Molded Plastics, Inc. (1951)

"Rio Vista" by Sundberg-Ferar
Plastics Manufacturing Company (1952)

Decorated Line by Joan Luntz
International Molded Plastics (1954)

New textures

When the molder contemplates the great mass of consumers who will decide whether his product really rates as dinnerware, he leaves the realm of perfect and obvious solutions. Dinnerware means china and pottery: heavy weight, clear translucent surfaces, rich and varied glazes. Plastic is lightweight and opaque. Should it try to develop some of the pleasing qualities of ceramic or make a fresh start? It's hard to make a fresh start, of course, unless you have some idea of where you're going. The clearest indication of a new direction for plastic dinnerware came from the expressionless suavity of the material and its ability to maintain plane surfaces or geometric curves. The flat coupe plate with curled edge is almost impossible to form in ceramic; as a contemporary shape it lends distinction to plastic, and it has become a typical form of the material.

But plain surfaces, be they ever so honest, are never likely to monopolize the market. Methods of applying decoration have been explored since the industry was born. The simplest and earliest, a raised or depressed design built into the mold, is particularly appropriate to the medium, although it has been criticized as a dish-washing nuisance. Molded decorations are usually used on flat pieces, but Watertown has printed its raised Woodbine pattern on hollow pieces as well, giving them a deeply undercut profile so that the pattern does not interfere with the opening of the mold.

The first dinnerware to offer the consumer a really china-like multi-color decoration was introduced a few months ago by International Molded Plastics. The method is patented by Einson-Freeman, and presumably involves an impregnated overlay, printed by lithography, that is put into the mold with the compound. Since the process is complicated and expensive, other molders apparently are glad to let IMP prove the market with its five decorated lines, which are priced to be "competitive with the best china," or fifty per cent above the undecorated lines.

Perhaps one reason for the industry's reluctance to leap into production of china patterns at china prices is the development of another method for improving on the old institutional ware. Many manufacturers have felt that plastic dinnerware, when it is replacing ceramic, competes with pottery rather than porcelain, and have tried to achieve the informal effects of plain glazed earthenware.

The finish on plastic is provided by the smooth surface (usually chrome-plated) of the mold. Most manufacturers try to give the highest gloss possible because it means an impervious and sanitary surface, but since the compound is generally opaque, even a high gloss does not have the depth of a ceramic glaze. However, the resin itself is colorless, and translucent, and if the resin

Woodbine, by Jon Hedu
Watertown Manufacturing Company (1952)

"San Jacinto" by Sundberg-Ferar
Plastics Manufacturing Company (1953)

Brookpark, by Joan Luntz
International Molded Plastics (1950)

content is varied and the filler materials are chopped to various sizes, it is possible to produce a translucent, mottled material. Russel Wright, an ardent champion of the integrity of plastic, came up with the assortment of textures shown on page 62 as a result of experimental attempts to make melamine a more distinguished material. Since increasing the resin content tends to reduce the strength of the material, the mottled dinnerwares now on the market are mostly only faintly translucent, but more radical materials may easily be developed.

New Shapes

Plastic dinnerware can also be given identity in its shape. Certain shapes defy the molding process—teapots, for instance. But others are more logical in plastic than in ceramic. Ceramic dishes are turned as they are made, so that roundness is a practical requirement. The modern vogue for free forms has managed to throw several ceramic lines off their axis, and in view of the fact that plastic is as easily molded in rectangular or asymmetrical shapes as in circles, the unassuming roundness of most plastic dinnerware is remarkable. Presumably it is felt that a radical material should not be too radical in form. Square dinnerware might make a meticulous table-arranger somewhat edgy, but an advantage is suggested by the box at left. Boonton made a stab at asymmetry in an early line. Since then Boonton's designer, Belle Kogan, has had to design a new place setting that would fit in with the old serving pieces. Her solution of a square in a circle is oddly pleasing and minimizes the haphazard effect of a group of off-center pieces.

Is it too good?

In a way the practical advantages of plastic are a nuisance to the designer and manufacturer. The Commerce Department publishes standards for plastic dinnerware, covering such things as wall thickness, that most companies meet in some or all of their lines. In addition, engineers advise regular walls, gradual changes of section, and sturdy rims. The strength of melamine, although it is certainly a tremendous selling point, may at times be the point of no sale. There are quite probably a lot of people who blow themselves to china because they like to raise a delicate cup to the lip. If plastic is considerably stronger than ceramic it has a considerable advantage, and perhaps the designer should not always be expected to sacrifice a delicate line to the ideal of making a tough material tougher still. When the choice is between the highest standard of break resistance and a graceful line, the customer may well vote for grace.

Color-Flyte
The Branchell Company

Boontonware
The Boonton Molding Company (1948)

Boonton Belle, by Belle Kogan (1954)

Opposite page: cup, saucer, bowl and plate. At the top of the page a line of china by the same office (Walker China Company).

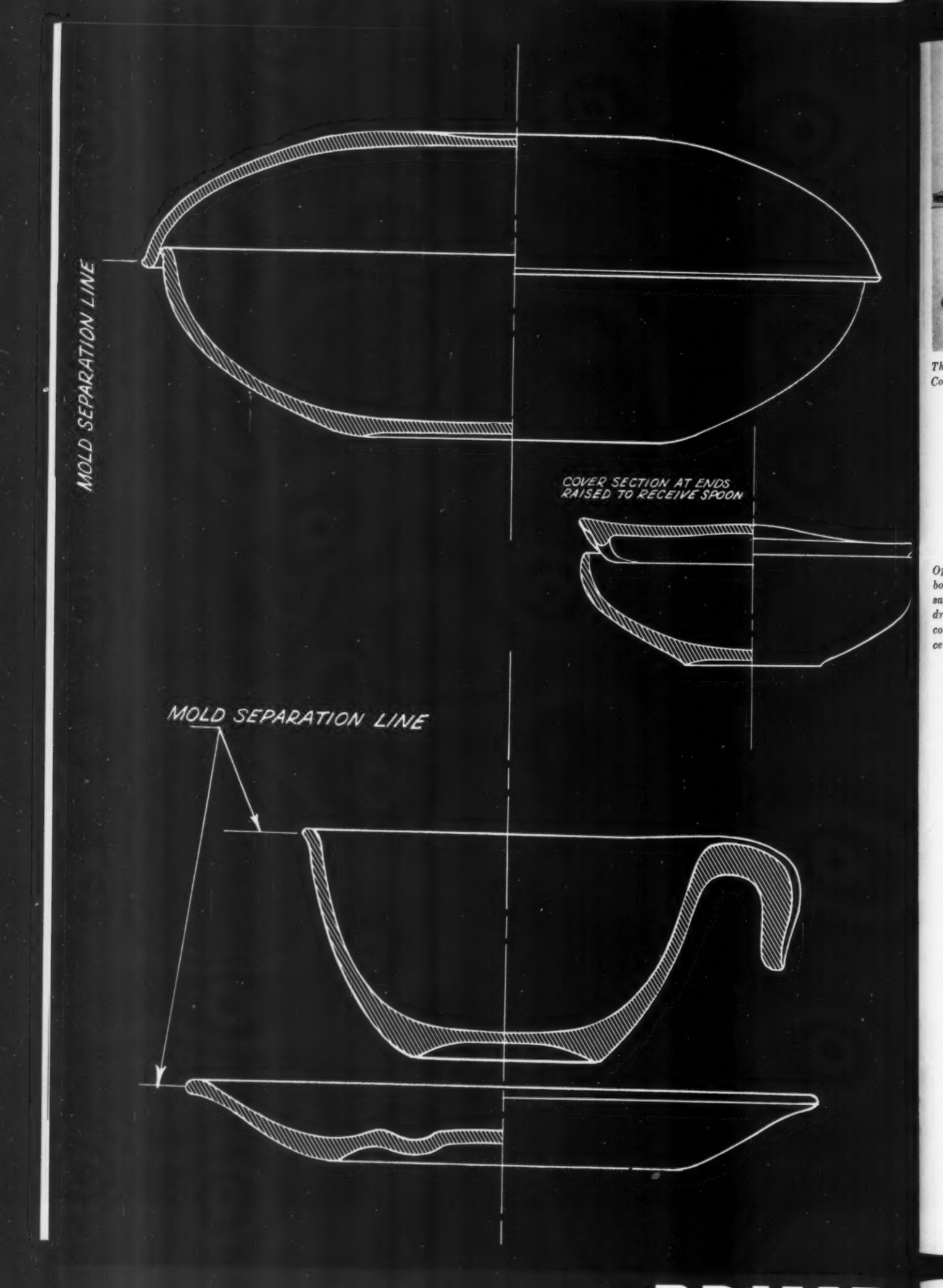
At this point plastic dinnerware means a number of things to a number of people, and it is almost impossible to say which idea, if any, will prevail. For example:

Irving Harper of George Nelson Associates went to work on a new line of plastic dinnerware for the Prolon Division of Prophylactic Brush with inspiration from two sources. To start with, he contemplated the only other common substitute for ceramic—the laquer used in Japan. Like plastic, laquer is light in weight, perfectly opaque, and somewhat warm to the touch. As the designs of the Japanese are beautiful and reasonable, it seemed logical to borrow them. Their delicate lines are easily reproduced in plastic, and their exotic quality promised to defeat the material's pedestrian reputation.

The Florence line manages to give the old institutional material dignity and elegance without changing anything but the color and a few of the rules. Colors have moved from the tasteless pinks and yellows to brilliant laquer red and black, mustard and warm gray. Such brilliant colors seem unrelated to ceramic and have a special aptness on synthetic material. The rules were modified wherever design dictated it: despite the virtue of the sturdy lip, the flaring walls of the Florence line taper to thinness at the edge.

The other source of Harper's inspiration was practical, springing from a fortunate communion of need between molder and housewife. It's a waste to make a lot of shapes and a nuisance to file them in the home, so all the Prolon pieces were designed for double and triple duty. Plates have the flat-bottom section that is impractical in a ceramic dish so they can be used as trays. Small containers double for cream and gravy or sugar and flowers. As far as details go, the most unusual is the positive relationship between cup and saucer, designed to make eating on the run somewhat easier.

The Florence line of dinnerware is a great step forward for plastic. It manages to give the material prestige with nothing more far-fetched than a graceful line and a clever practicality.


MOLD SEPARATION LINE
COVER SECTION AT ENDS
RAISED TO RECEIVE SPOON
MOLD SEPARATION LINE

The plate has easily gripped handles. Cover of small bowl can stand alone as an extra bowl. Cover of vegetable dish is a shallower dish. Below right: platter, creamer, divided vegetable dish.

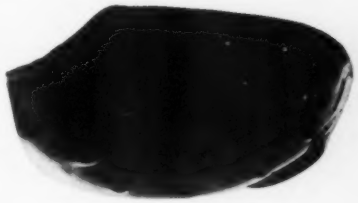
Opposite page: vegetable bowl and cover; cup and saucer. The smaller drawing shows a bowl cover detailed for ceramic.

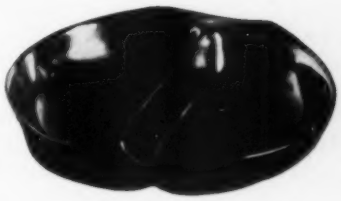
Russel Wright, a founding father in the field of plastic dinnerware, has an appropriate feeling of responsibility toward this new medium. In the prototypes he designed for American Cyanamid in 1945 he established a basic rule: plastic articles should express the molding technique with liquid, flowing lines. Since then he has proved his belief that melamine could be as interesting in fact as it is in formulation by working without sponsorship to develop a more distinct and appealing quality in the material itself.

Mr. Wright's new Residential line for Northern Industrial Chemical makes no mention of plane surfaces, and geometric curves are rarely followed. The pieces do not rise formally from a base, like more traditional ones, or circle round a central axis, but sweep into useful contours without any announcement of beginning or end. Plates spread out to handle shapes; cups and cream pitchers are drawn into integral stems. The saucer is a series of ripples arranged to nest the cup. The care with which flash lines are placed to be unobtrusive is typical of Mr. Wright's interest in the technical problems of his medium. The vegetable dish and a shallower dish that serves as its cover are so perfectly mated that they close without any sign of a joint—in ceramic, warpage precludes such a delicate relationship.

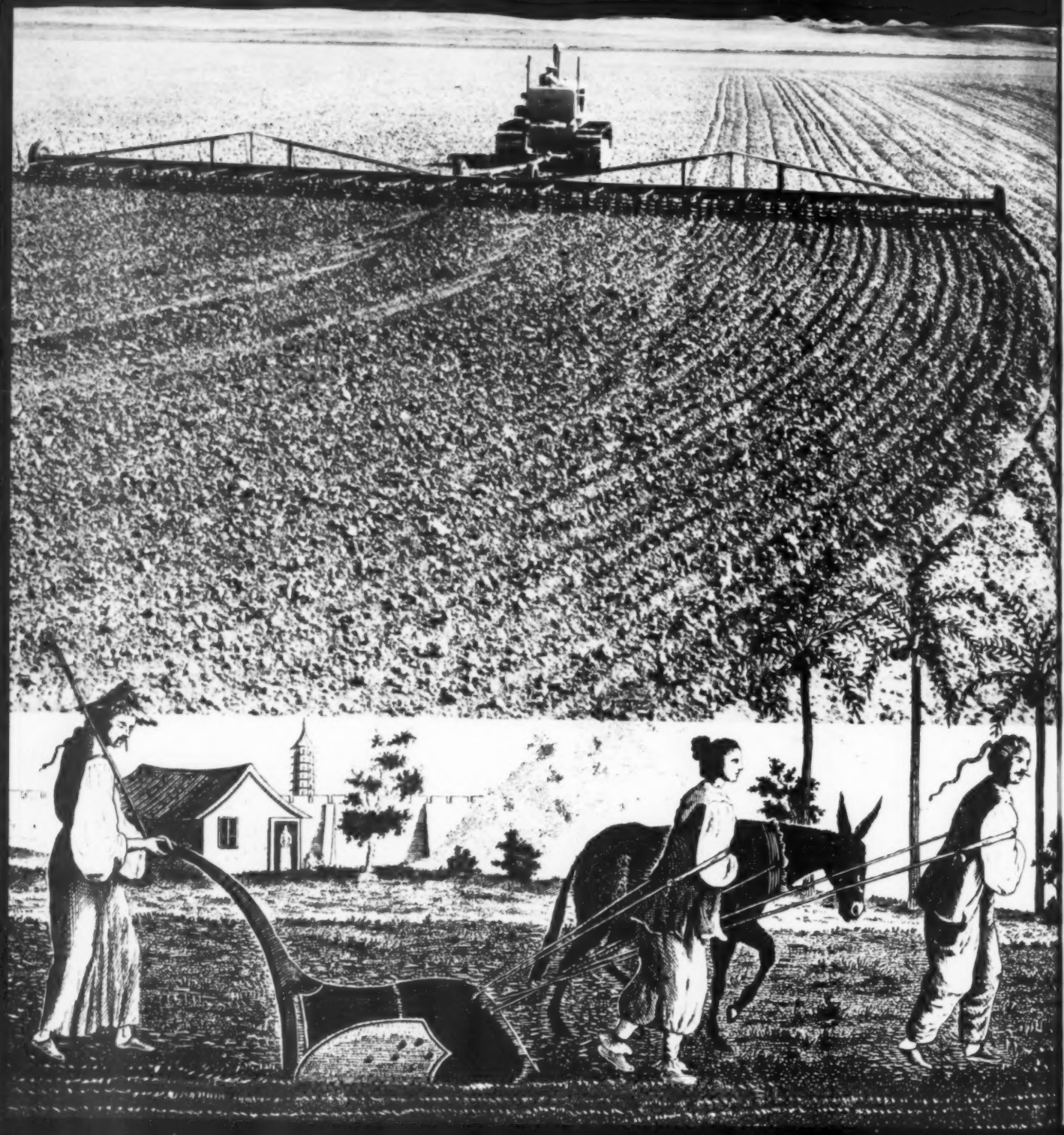
The plastic used in this line has a mottled translucence that shows most clearly in a pale blue and a watery yellow, but it gives depth to black and copper. It recalls a heavy glass.

Whichever might seem most successful in execution, in theory it would be difficult to choose between Wright's amorphism and the classic perfection of the Nelson line. They are two poles that indicate the possibilities of plastic dinnerware.





PRIME



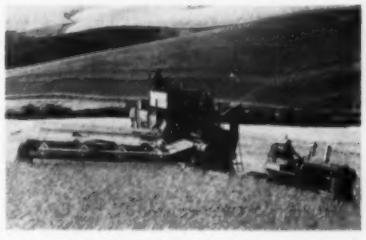
Anyone designing or selling a strictly utilitarian product on a competitive market should consider the tractor: a tough problem in functional and engineering design, it can rarely be improved by superficial face-liftings. At its best, its appearance is an expression of performance and practical value to the buyer.

"A few farmers may buy the Lovely Lily tractor because of its gorgeous paint and the sweet symphonies of its carburetor, but the vast majority are going to buy the Gitupangit because it develops the required horsepower to pull a definite number of plows through soil of many textures without panting or getting the heaves." Thus wrote a sage observer of the agricultural mind in 1916. The farmer was in his traditionally undercapitalized state; the tractor was a new, expensive and untried contraption, and the farmer was not easily convinced it was worth a large outlay of cash he didn't have anyway. It was going to have to pay off in service or it wouldn't be worth its weight in fodder. He would wait and see.

The fact that there are some 4.2 million tractors on American farms today (100 times the number in 1916) suggests that the manufacturers delivered that value. They did it by making the tractor a superhuman power source that can push, pull, lift, turn and do almost anything on the farm but a hoe-down. But in spite of all this, the industry in some ways seems to be back where it was in 1916: buyers are waiting to see what develops. The hypersensitive farmer has been the first to grow defensively frugal at the economic uncertainty in the air. A new tractor would be nice, but the old one was built for a lifetime and will probably last out another year. So the competitive pitch is raised, as it is in cars and refrigerators. This knowledge probably does not console the tractor maker, because he has the toughest customer of all—the one who knows what he's up to, and up against, and won't be seduced by a new swipe of chrome or an emblem of luxury.

How does the manufacturer stay in business under these circumstances? Essentially, by working harder than ever to keep the farmer in business—and this is the crux of farm machinery design: if the machine serves the farmer, he will have money to put back into machines. If the machine fails him, in good times or bad, he will not. Thus, in a curious economic round, the welfare of the industry is tied directly to the welfare of the consumer. The farmer's good is everybody's good — including the man who equips him to make good. His own best defense will be to know how the product can serve the user, and this is where design may have something to add.

The all-powerful modern tractor can lift a load of hay,

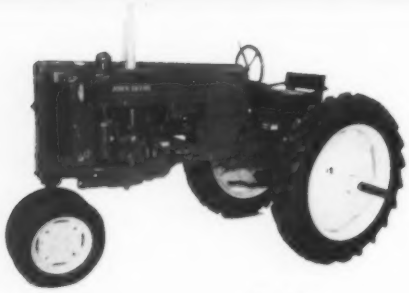


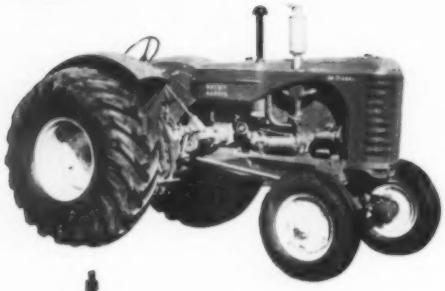
pull or assist large grain combines,

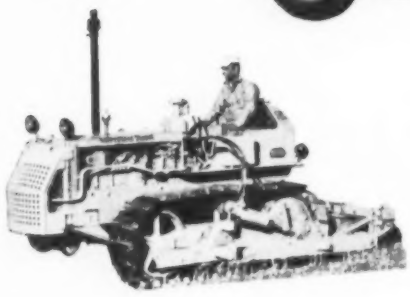
power an integrally-mounted cotton picker

drag a hayrake or any number of light attachments,

and develop sufficient power for heavy plowing.







There are three basic types of tractors: the light, maneuverable general purpose tractor, usually with tricycle-type wheel base or adjustable front axle for accurate planting and cultivating (John Deere); the heavy-duty wheeled tractor for extra service and hauling power (Massey Harris); the track-type crawler, which is especially useful for soft soils and large acreage (Caterpillar). They usually offer four kinds of power: belt power, for sawing wood and churning; drawbar, for pulling; take-off power, for drawn mechanized attachments like the hay baler, which is driven from the tractor's drive-shaft; and front and back lift power, for drawn attachments like plows, or like the hay-loader mounted directly on the tractor.

What the farmer needs

Because the farmer's biggest headache is the breakdown, his prime tractor requirement is ruggedness and reliability. When something goes wrong he must make the repairs himself, or lose valuable time. He wants the ailing parts where he can get at them, and has notorious disrespect for shrouds which get in his way — which accounts for the uncovered motor which gives the tractor its virile look.

The farmer wants easy steering, a sharp turning radius, mudgards which protect him without clogging (viz. open fan-shaped fenders), a good radiator screen, a convenient and comfortable seat, and good visibility. (Seated behind a massive motor unit, the farmer has never had perfect visibility, and twisting and bending remain part of modern tractoring.)

The tractor is not a high-speed but a high-power machine, and the farmer wants it to develop the greatest possible power at speeds of 1 to 15 miles an hour. Thus it need not be shaped to penetrate space at a high clip, but rather to exert an efficient pull along the ground. And he wants versatility: a machine which pays for itself by the number of tasks it does and the variety of implements it powers. Once he has sunk his money into a tractor and line of implements, he does not look kindly on changes which leave his investment obsolete.

Problems and progress

The tractor has never been an indulgence for the man who buys it; it is a team of horses and a crew of hands. He will, like anyone else, take pride in a handsome machine, but "handsomeness" to him is an expression of the performance and power he thinks he is buying. The essence of "power," of course, can be communicated by other means than sheer bulk, which is why efforts to lighten the tractor and improve its weight/horsepower ratio do not contradict its character. A sinewy, well-balanced modern tractor looks quite as serviceable as one of the early steam or gas machines, which were built on the theory that power and traction came from dead weight (some weighed 25-40 tons). It was the automobile that indicated that a lighter unit could also be strong (and cheap), and many farmers jumped the gun on the industry by using stripped-down Model T's for hauling jobs. Henry Ford's early experiments led to the mass-produced Fordson in 1917; International Harvester offered a small rowcrop tractor in 1915; and by the '20's farmers were sold on the "general purpose" tractor: it was light enough to do tillage work, and strong enough to do heavy pulling, and this versatility was critical to its acceptance on American farms.

American tractors, descended from gasoline-driven prototypes, were built on a welded metal frame which rested on wheels and held the working parts aloft. In 1939, International Harvester's small Farmall A eliminated this heavy frame entirely, and used a strong cast housing around the driveshaft as the structural member. This not only greatly clarified the machine as a visual unit, but cut its weight and cost appreciably. The central shaft, which appeared in Ferguson's English Huddersfield in 1936, has subsequently been used in many light and middleweight tractors, though its clarity has slowly been lost in a welter of mechanical additions.

The diagram on the opposite page shows how the tractor became the prime mover on the American farm.

By tracing across the page such basic farm tasks as plowing and harvesting, you will find that two tendencies mark the growing efficiency of modern farming: combination, *and* specialization, *of implements. As long as there was only human energy, supplemented by animal power, to perform the many operations of farming, progress was slow. In the 19th century farmers and manufacturers tried to increase efficiency by combining certain tasks—first with the harvester-binder, then the harvester-thresher "combine" which eliminated gathering and binding entirely. They also made more specialized implements which would work better for particular tasks, crops or soil conditions. Their inventions, in fact, were far ahead of the power which moved them; they were forced to limit their machines to the speed and strength of a horse team, and by the end of the 19th century most implements had reached their maximum capacity for use with work animals. The combine was actually invented a century before it was in use on most farms —a largely useless contrivance until it could be powered by something more practical than a 30-horse team.*

The steam traction engine, and the gasoline tractor which was patterned after it, provided some of the needed power in a strong but unwieldy substitute for the horse team. But the tractor became important mainly because it surpassed the horse in not only the quantity *but the* nature *of its power. It became lighter as it became stronger, a power source maneuverable enough for rowcrop cultivating and sturdy enough for heavy duty hauling, adaptable to both specialized tools and large combines. Whereas the horse could only pull, the tractor offered different kinds of power — turning, lifting, pulling and direct power for integral attachments — which took over increasing numbers of farm tasks. By developing this astounding versatility, the tractor has become as indispensable to the modern farm as electricity is to the many-appliance household.*

Because recognition value is considered important by tractor manufacturers, two design features have been widely used to give tractors their company identity: color and silhouette.

The objective, generally speaking, is not only for a motorist to recognize a slow-moving tractor on the highway, but for a farmer (a potential purchaser) to recognize the brand of tractor being driven by his neighbor at several fields' distance.

It is interesting to see what a variety of distinctive silhouettes have been achieved—by arrangement of fenders, housing, seats, steering and even the mechanical core—on a machine whose form is generally said to be determined by engineering considerations alone. Though differences in size and power source (Diesel is being commonly used for heavy duty machines) have some effect on these silhouettes, each firm manages to preserve this recognizable character throughout its line.

TILLAGE

Plowing

Sowing

Harrowing

Cultivating

HARVESTIN

Reaping

Gathering

Binding

THRESHIN

HAYING

How the tractor became the fa

manpower

TILLAGE

Plowing

wooden plow

iron-plated plow

iron plow

Sowing

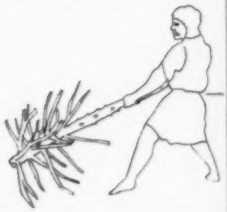
broadcast seeder

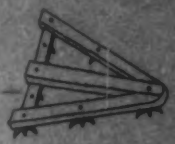
horse drawn seeder

seed drill combine

Harrowing

Cultivating





triangular pinteeth harrow

oblong pinteeth harrow

HARVESTING

Reaping

McCormick reaper, 1834

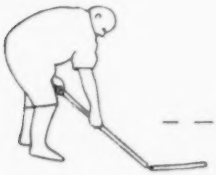
Gathering

hand raker seated on mower

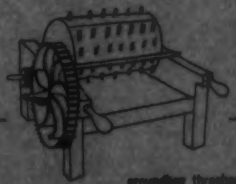
hand raker seated on reaper

Binding

THRESHING



primitive threshing sled



pounding thresher

HAYING

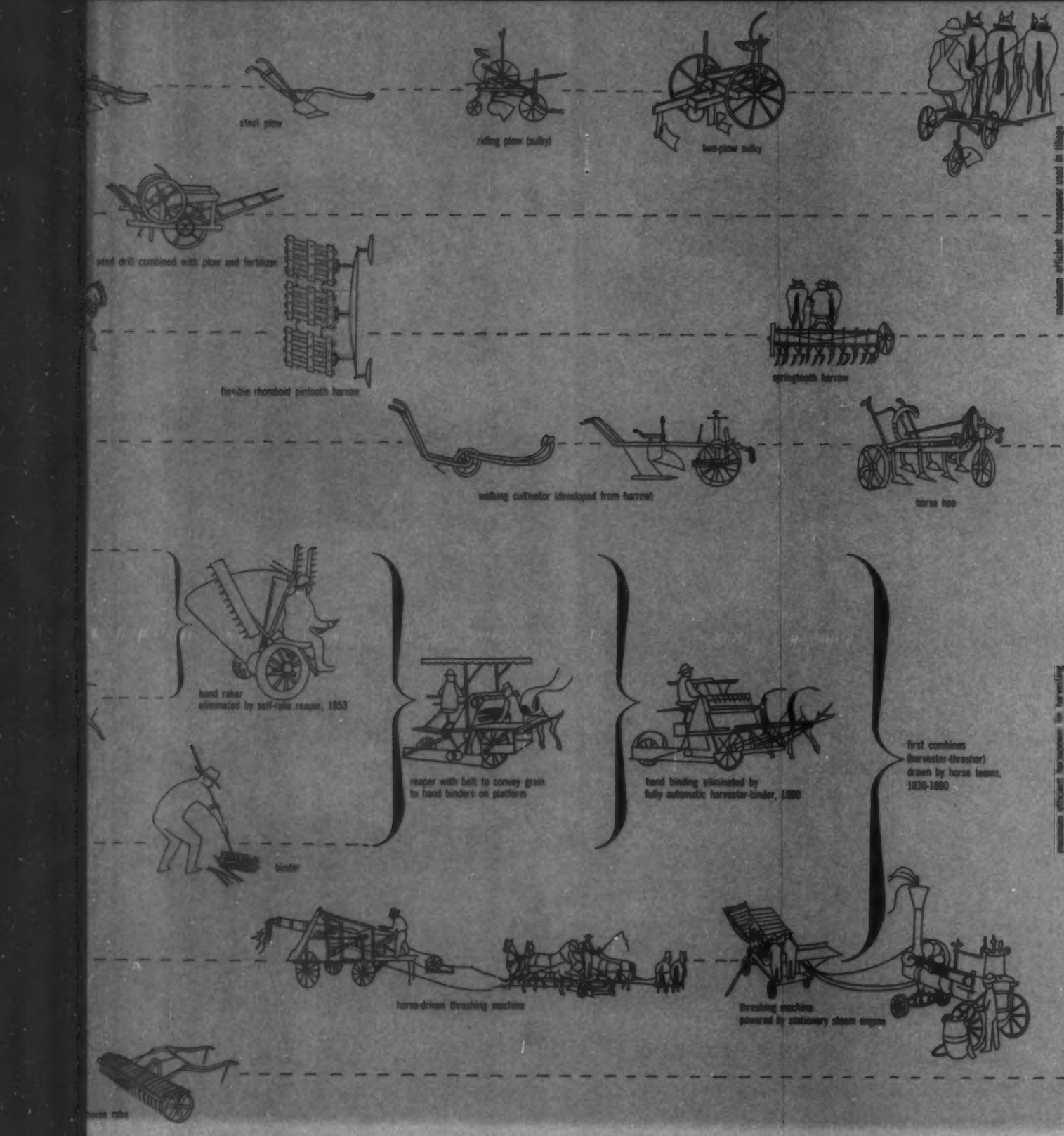
drag rake

flop rake

horse rake

e farm's prime mover

animal power



steam traction engine

multiple bottom plows

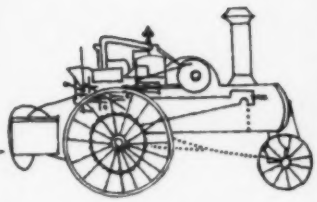
grain drills

disk harrows

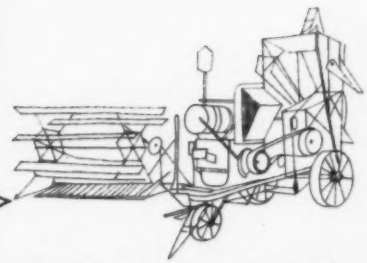
lever harrows

coulter harrows

straddle-row cultivators



steam traction engine, powerful but unwieldy, used to draw tillage implements on large farms.



mammoth steam traction engines make combines feasible for large farms

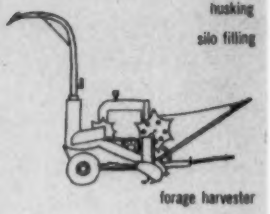
side rake

internal combustion engine

grinding

husking

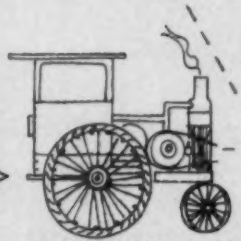
silo filling



forage harvester

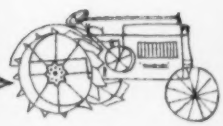
corn picker

wagon



heavy duty gasoline tractors used for large acreage harvesting and combining, 1906-1925

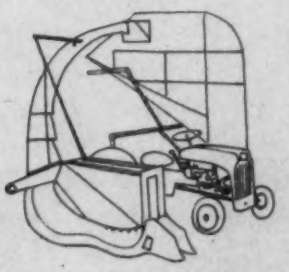
light row crop tractor 1915



general purpose tractor 1920's-1954

workable farm combines, 1920's

small farm combines, 1930's



cotton picker

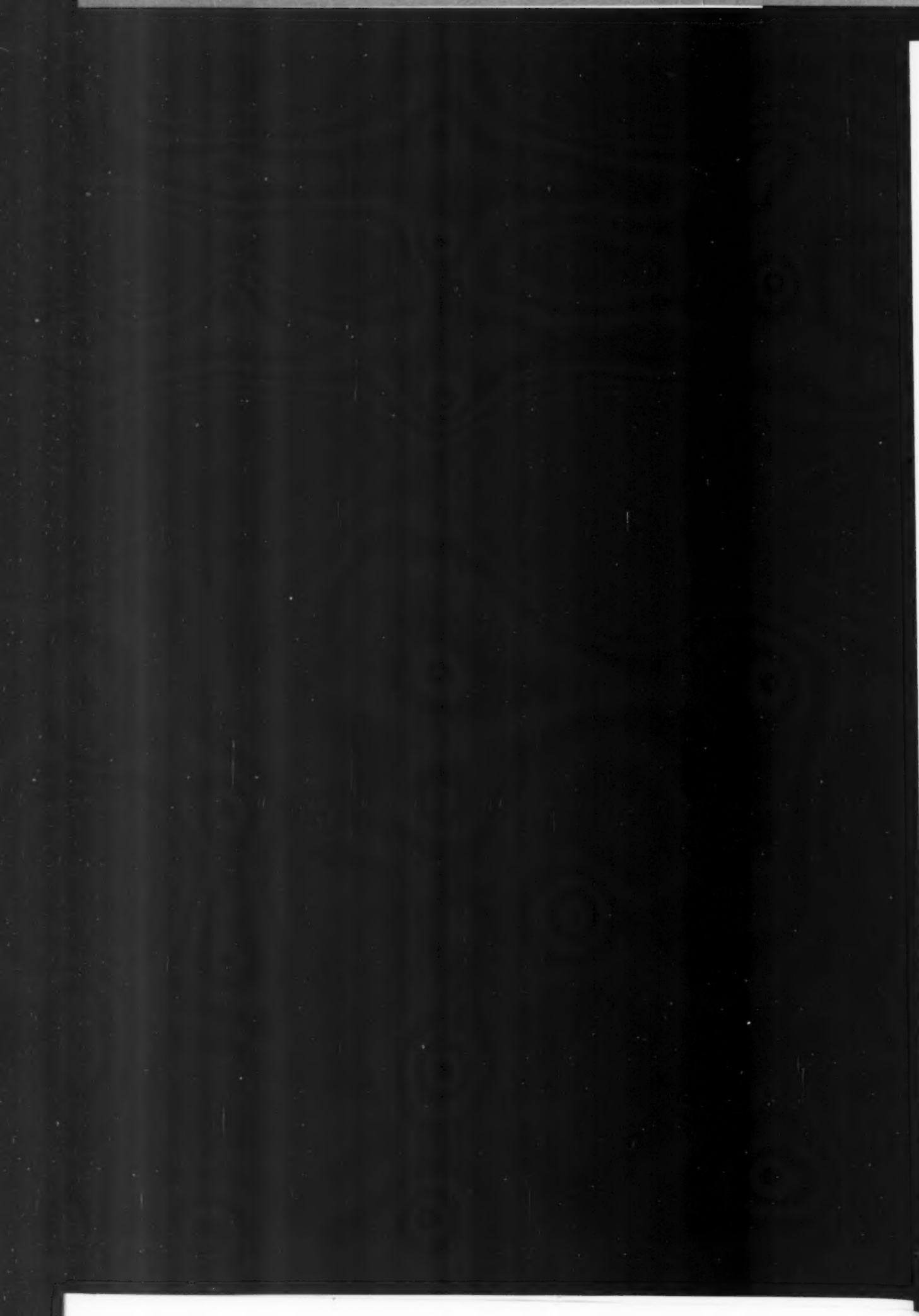
hay loader

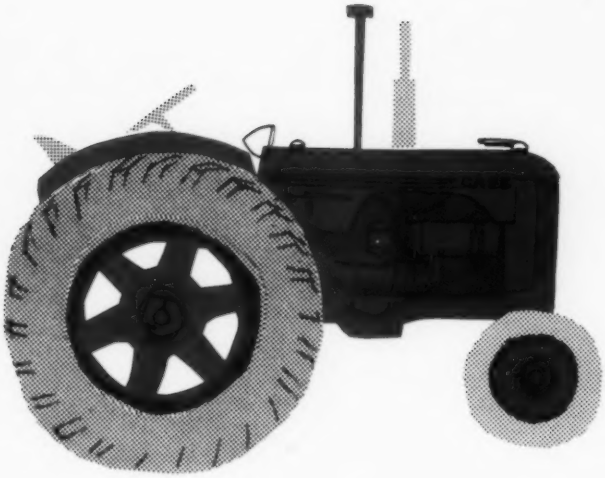
hay baler

spraying

sawing wood

ditch digging





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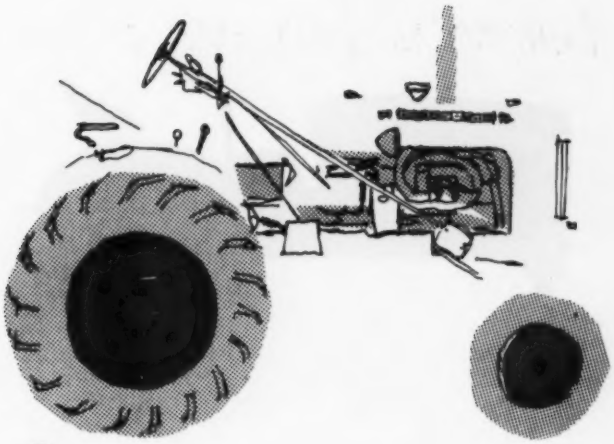

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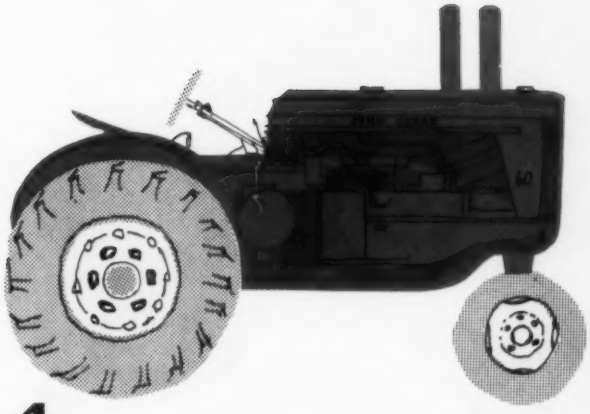

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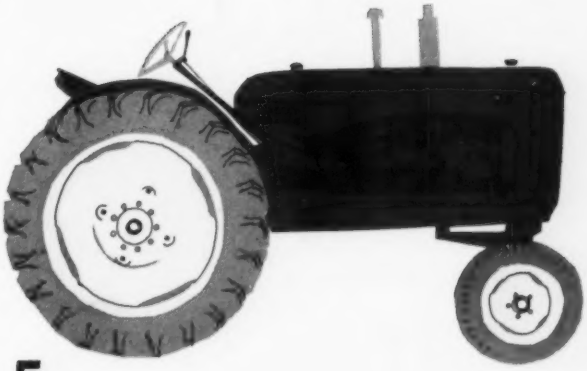


5

1 J. I. Case DC tractor

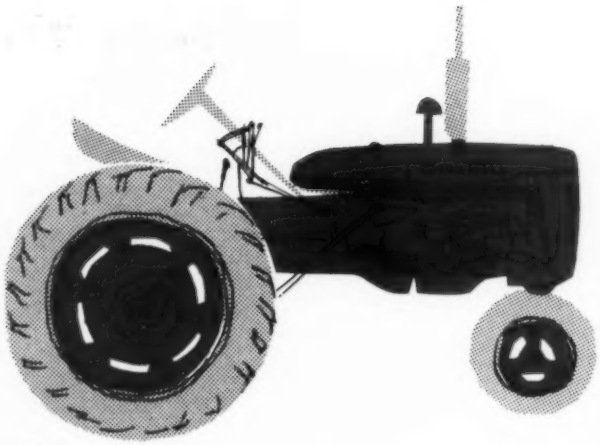
2 Ferguson "30" tractor

3 Minneapolis-Moline 1 Row tractor

4 John Deere Model 60 Standard tractor

5 Massey Harris 33 tractor

6



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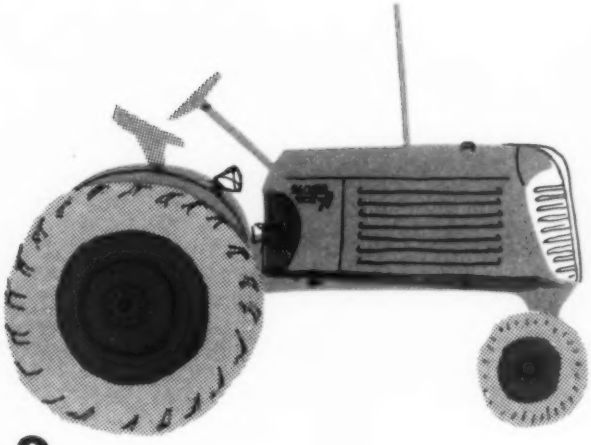

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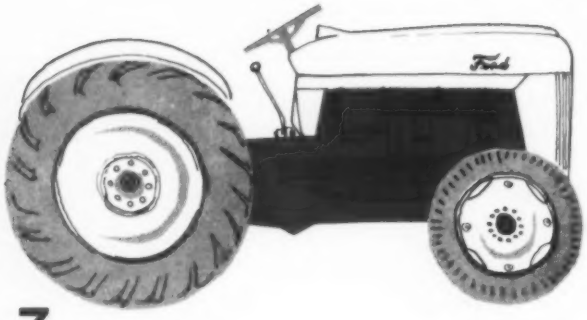

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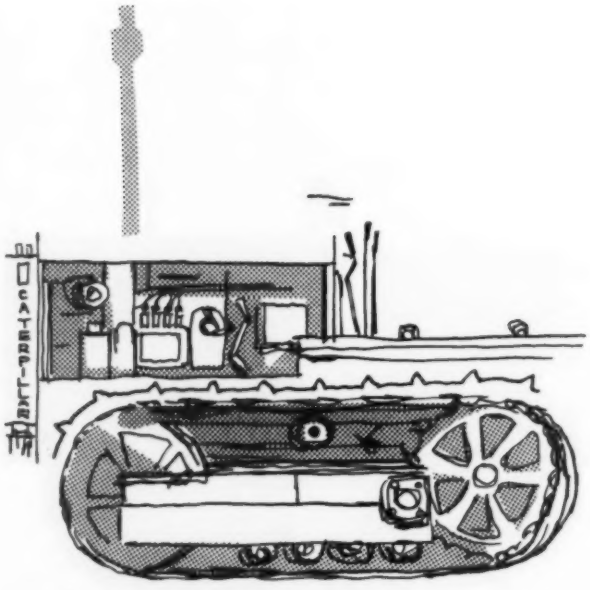


10

6 Allis Chalmers CA tractor

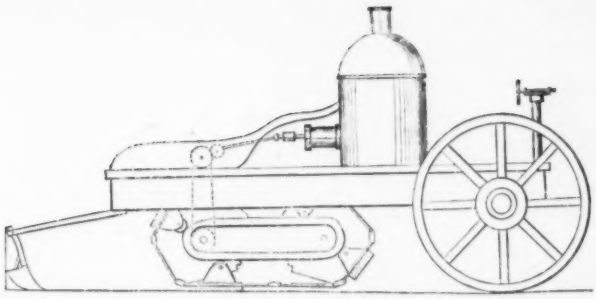
7 Ford NAA tractor

8 International Harvester Farmall Super C tractor

9 Oliver "77" tractor

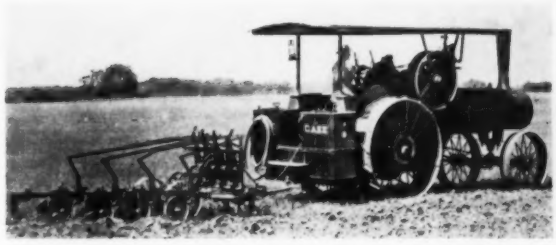
10 Caterpillar Diesel D2 tractor

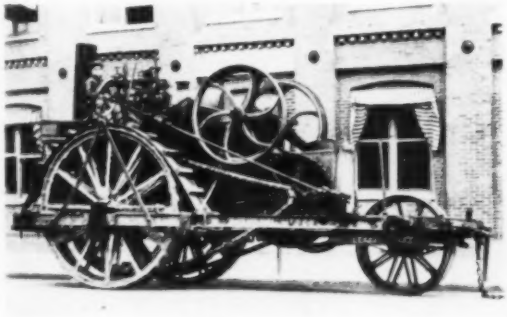
STEAM

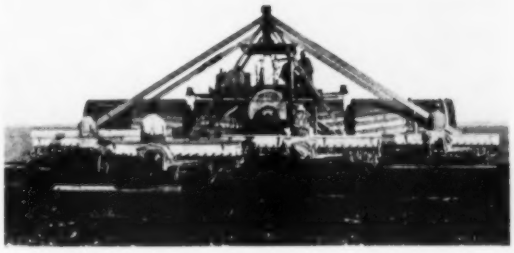


English patent steam traction engine needed this enormous mechanism to pull a tiny plow (1871).

J. I. Case's steam engine No. 1 (1869) *was pulled into the field by horses, supplied belt power for threshing and sawing.*

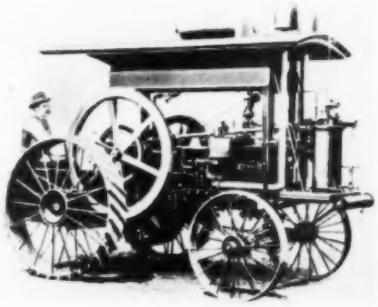




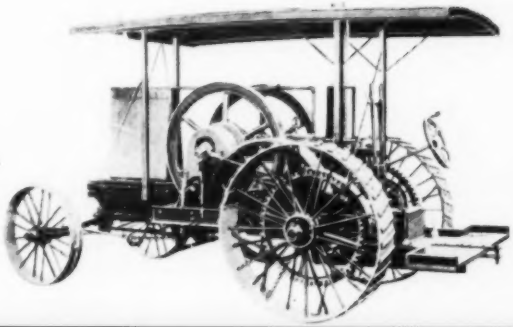


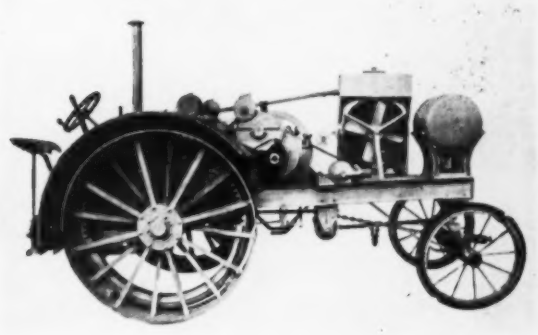
Traction and steering made the "tractor," in form a descendant of the steam engine. Fabulous Holt steam tractor (1890, *far left*) *relied on weight for traction;* 1905 *model with 6-foot-wide wheels, worked a 44-foot strip of land* (*left*).

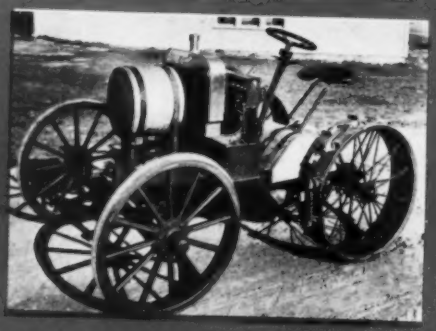
GAS



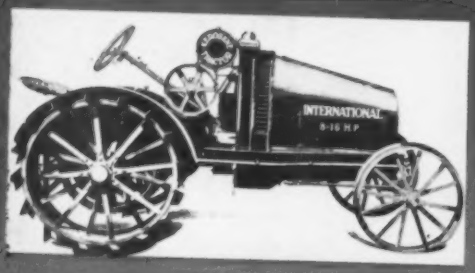
With parts adapted from the steam tractor, Case brought out a gas tractor in 1892 (*left*); *International Harvester started regular production in* 1906 (*left, below*). 1914 *"Waterloo Boy"* (*now John Deere*) *was kerosene burning;* 118 *were sold. Note gears on rear wheels.*



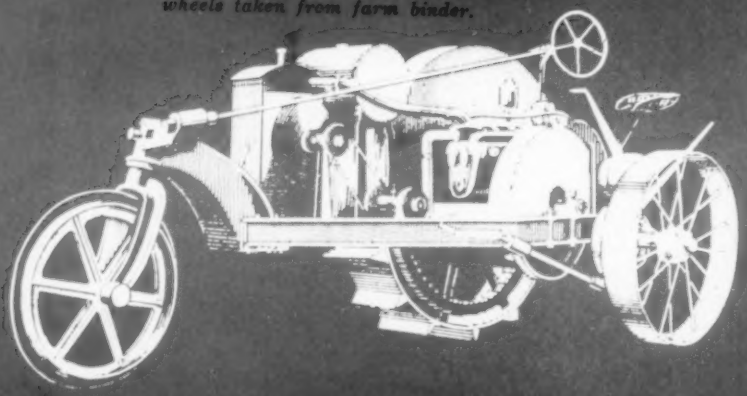


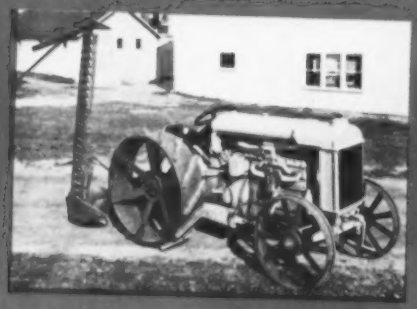


Automotive beginnings of the modern tractor: Henry Ford's 1907 experiment with an "automobile plow" had 24 h.p. engine, rear wheels taken from farm binder.

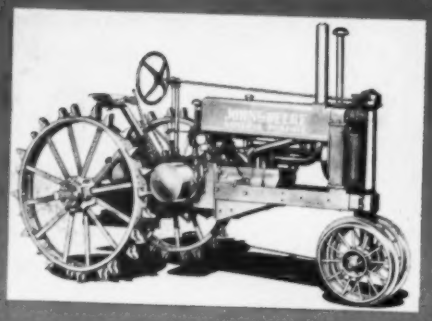


An early attempt to make a machine for smaller farms was Harvester's rowcrop of 1915.



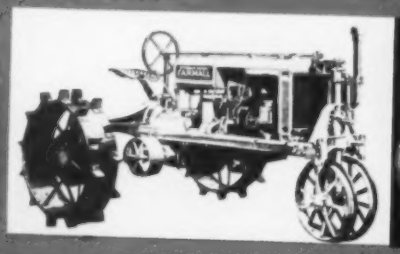


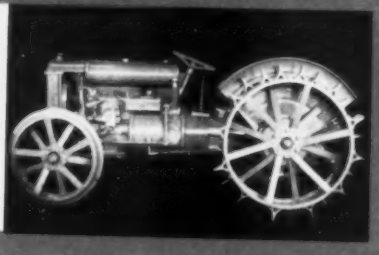
First mass-produced tractor was 1917 Fordson; some are still in use.



Above: Massey-Harris' Big Bull, 1917, had a light, maneuverable 3-wheeled frame of unique elegance.

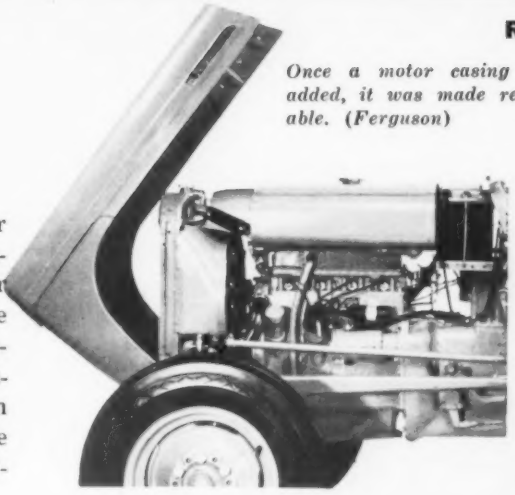
John Deere offered one of the early all-purpose tractors with four kinds of power; Model "A" of 1933 offered hydraulic power lift.





Above: Ferguson English Huddersfield, 1936, supported by driveshaft housing is a remarkable structural design. Right: Harvester's Farmall General Purpose was carried on square welded frame until redesigned in 1939 (below).

Light Farmall A, part of line developed by Raymond Loewy Associates with IH engineers, has articulate expression of shaft structure. Off-center steering gives clear vision and direct shaft connection.



Once a motor casing was added, it was made removable. (Ferguson)

With this exception, the basic form of the tractor has hardly changed since 1920, though the intervening years have seen myriad refinements. Change for change's sake has been admirably missing from the industry's thinking. Such improvements as pneumatic tires, hydraulic controls, better hitching systems, easier seats and power steering have been added as they came along, to make the farmer's life easier. On these refinements, most of them mechanical, manufacturers have traditionally competed.

The contemporary quandry

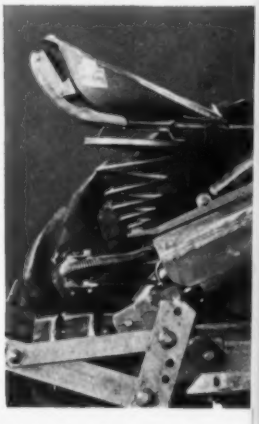
The tractor is virtually indestructible; 98% of the 1939 models were still on American farms in 1948, and will probably remain there as long as their motors turn over. This, of course, makes the industry somewhat nervous about its future. Some firms now regard forced obsolescence as their only salvation, a curious twist in view of the farmer's financial conservatism and the industry's stake in serving him well. It seems unlikely that farmers will be persuaded to turn in usable machines at stylish intervals *unless* a new model is measurably more efficient and a good buy; then he might become a second-tractor customer (or fifth or tenth) instead of a replacement customer. The only question is, which tractor shall it be?

Most manufacturers admit that the tractor's appearance matters to the modern consumer. Improved "appearance" is presumably viewed, therefore, as a valid competitive weapon. But how can it be done? The supply of refinements, visual and functional, is not inexhaustible. The tractor's form, as far as it has evolved, is basically honest, and without vulgarizing it there is no easy way to improve or even just alter it. Only the motor housing lends itself to not-too-consequential changes, with the result that it gets more attention, and often more voluptuous shaping, than the machine's form requires.

It is interesting, on the other hand, that most tractors have achieved "trademark" shapes from their very different mechanical arrangements—some compact, some lean, others square or round. This is undoubtedly the fruit of willful choice, the balancing of functional needs and desired visual results. It is, in fact, proof that tractors *are* designable.

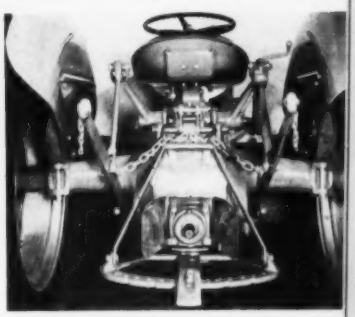
Designer and engineer

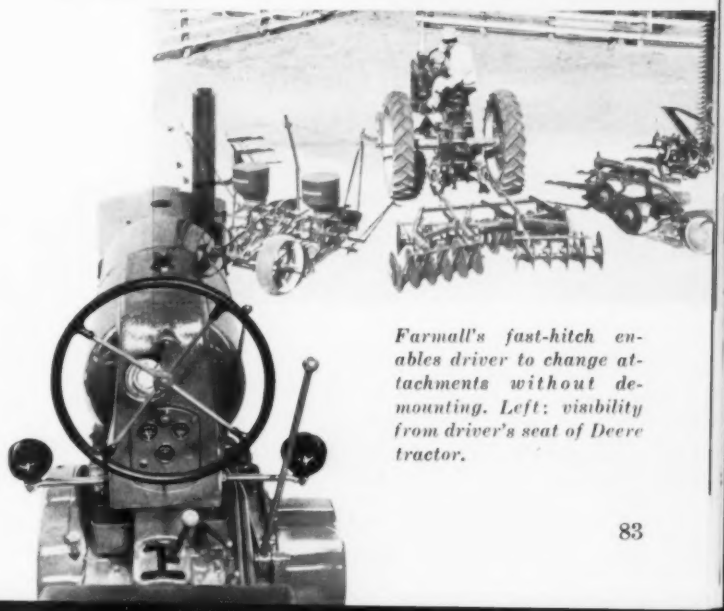
A tractor's "design" is the total expression of the job it does. The motor and driveshaft are not its design; they are its structure. The form they take, individually or together, *is* its design. This form is most satisfying when it communicates the underlying structure directly or by implication. This does not mean that structure must always be exposed. When it has a pleasing form—like the suave fuel



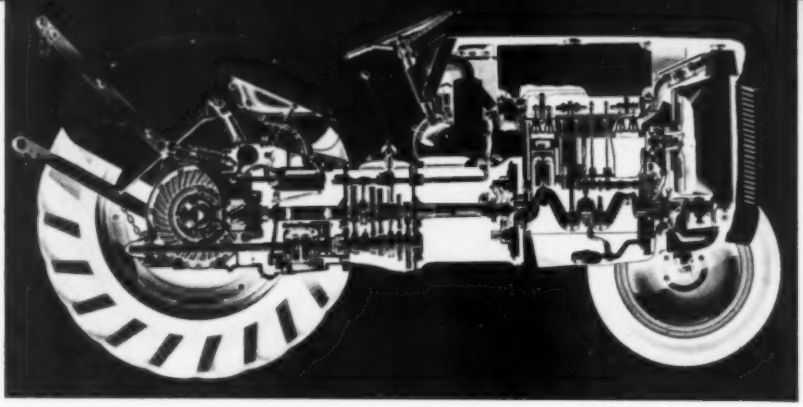
Seating has received much attention; John Deere (left) has championed the upholstered seat; others, like Massey-Harris, have developed fine seat coil springs for rough riding. Below: power take-off shaft and swing drawbar.

IH Super M-TA now offers no-shift Torque Amplifier.

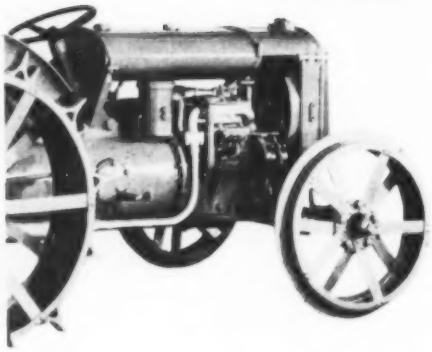




Farmall's fast-hitch enables driver to change attachments without demounting. Left: visibility from driver's seat of Deere tractor.

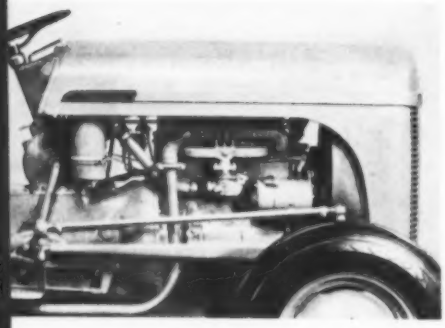


HOUSINGS

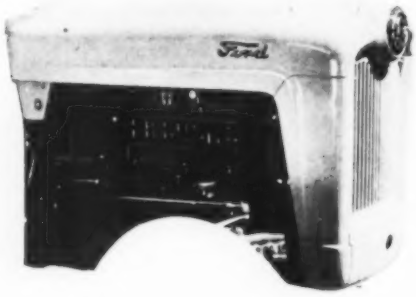


Suave Huddersfield fuel tank served as motor cover (1936).

Deere has consulted Henry Dreyfuss for 17 years on its tractor design; he developed the distinctive square-lined housing.

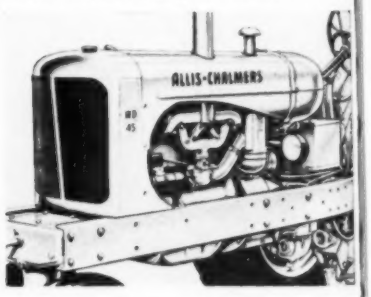


Ferguson's tip-up hood was developed, with modern tractor, by Engineering Vice-President H. G. Klemm.



Ford's sculptured cover shows influence of auto styling.

Allis Chalmers develops an S-curve around shaped tank.

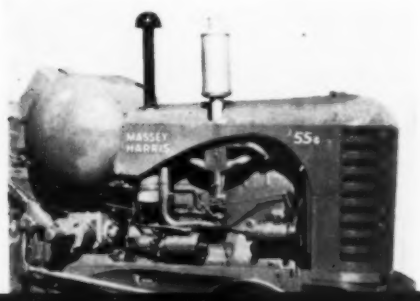


Case's cut-away housing reflects squarish lines of over-all silhouette.

Only Oliver conceals power unit completely. (Wilbur Henry Adams, consultant designer.)

Farmall's tapered tank is simple and expressive, becomes the motor cover.

Massey-Harris reveals engine under arch ending in fuel tank.

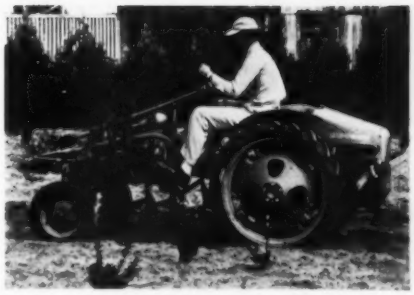


tank of the Huddersfield—there is reason to express it in the design; in fact it would be a crime to conceal it. When the structure does not help the total effect (or can't be uncovered) there is reason to cover it *or* re-engineer it so that a pleasing form comes out. Simply putting working parts together is not an assurance of successful engineered design (though it happens) ; neither is a sleek covering.

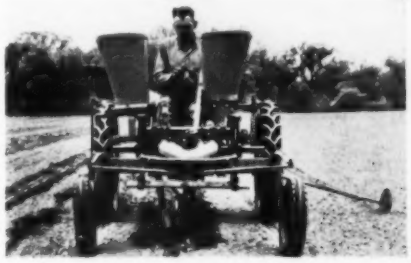
This business of covering and exposing, accepting and rejecting, is as much a part of design as making softer seats. It is, in fact, the process that produces an expression of the machine's inherent qualities.

The engineers who devised early tractors were also the men who gave them form. Today the creation of that form is often the responsibility of professional designers working with engineers. The industry, anticipating future marketing problems, may decide to take its cue from consumer products, and ask its designers to change the tractor's external appearance even when the existing machine is a good expression of its engineering and performance.

But the tractor is not a sacred cow; it is a man-made convenience, remarkable but not immutable. If refinements of form are necessary for the sake of public relations, the changes may be more successful if they are integrated with the basic re-engineering which every company undertakes periodically, or if they grow out of the mechanical improvements which will undoubtedly continue to distinguish the industry. Whether the important ideas and innovations come from the man who gives the tractor structure—the engineer—or the man who gives it form—the designer—will depend largely on firms and individuals. What matters is that they have a chance to tackle the same problems together—the buyer's problems.—*j. f. m.*

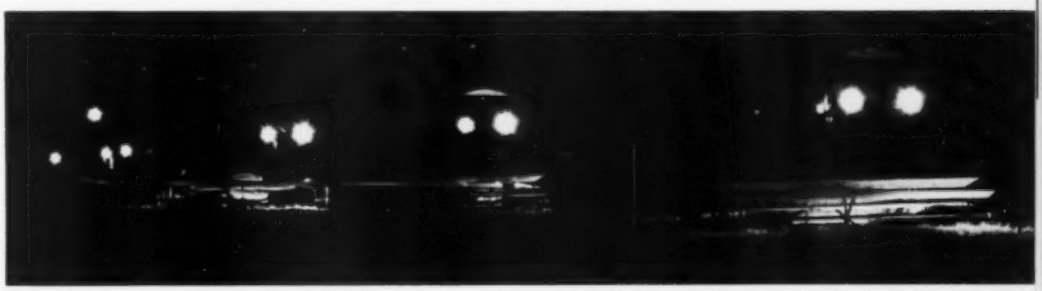


Allis-Chalmers was first to use a rear-engine design to achieve precision steer-



ing and clear vision in rowcrop work. An interesting new form is the result. Disbal-

ance created by heavy rear attachments makes it impractical in larger models.



One threat to the tractor's supremacy: larger implements like combines tend to become self-powered.

a talk

with


MARTIN-SENOUR PAINTS
NU-HUE COLORS


WET PAINT MARTIN-SENOUR
Originators of Nu-Hue Colors

Mr. Stuart

THE CLIENT WHO DIDN'T HAVE TO BE SOLD

"The trouble with designers," said Mr. Stuart almost before the subject had been introduced, "is that they aren't aggressive enough. I just wish one of them had approached me years ago, when I should have started thinking about these things." One might expect such a statement from someone whose record was scored with a thousand wrong turns, but not from a man who had successfully found his way out of one of the toughest mazes of American enterprise: a small, depression-bound business groping for a way to survive. But William Moore Stuart, the tall, affable, irrepressibly energetic president of the Martin-Senour Paint Company, said it with characteristic directness, and he obviously doesn't mince words. Most of the roadposts out of that maze have led him, in one fashion or another, to design; today he has the help of designer Morton Goldsholl, who has created for Martin-Senour a distinctive and highly appropriate visual personality; but for twenty years Mr. Stuart worked singularly unaided to give prestige to a company and character to a can of paint.

"When I arrived, Martin-Senour was—in some distinguished company — losing its shirt. It behooved us to find some specialized niche where our quality product would be known and remembered. We didn't want to be known as the biggest firm — only the best." That was in 1932. The firm's sales have since risen 1000%, against a general industry rise of 500%. As anyone who rides buses, reads magazines or inhabits paint stores undoubtedly knows, the company's reputation and color selection are virtually unmatched. This takes some accounting for.

"Twenty years ago," Mr. Stuart remembers, "all the companies offered only a handful of pre-packaged colors—tans, ivories, beiges, buffs, whites. They were grim, and the industry was bogged down in horse and buggy merchandising. My idea was simply to place a bet where the industry had never placed one before: the home. The big boys chided me for playing to the carriage trade. We showed them, I think, that the mass of small homeowners was just as interested in better paint and better color as anyone else. All we had to do to prove it was make it available."

With remarkable perspicacity he singled out one group of customers as a special objective: decorators. They were hardly a drop in the national paint bucket in those days, but they had entree to American homes and that's where Mr. Stuart was hellbent to put Martin-Senour paint. By serving them then, he anticipated by a decade the remarkable rise of the decorator and architect market, and by *two* decades the fabulous do-it-yourself market which was to be much influenced in its home-improvement urges by the custom idea. The company's success with the home market, in fact, undoubtedly grew from the wisdom of seeing both markets as sides of the same coin.

Paint color, in the era of the "tenement tans," was not exactly high art. Theoretically thousands of colors could be mixed from six major hues, but it was costly. The matching of paints to samples, by the retailer or the painter, was risky at best, and the specially mixed hues could not be duplicated after time and soiled fingers had made their mark on the wall. Selling pre-mixed paints in a variety of colors was always possible, but that brought up the

Photo: Betty Rosenz

Designer Morton Goldsholl

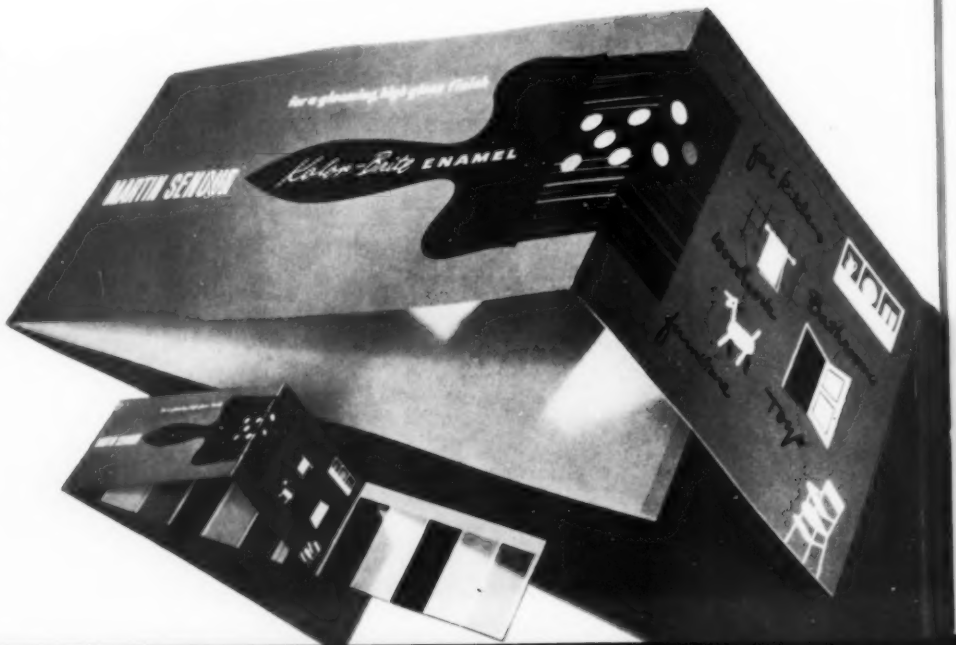
inventory problem—and the all-powerful dealers were highly sensitive to it.

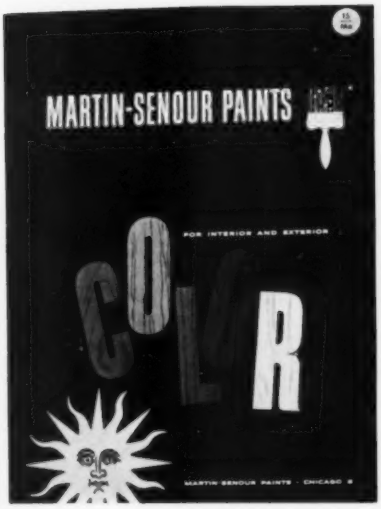
Early in his career Virginia-born Bill Stuart had been conditioned to the dealers' point of view, having entered the paint business ("I got into paint in order to eat") as a salesman for Sherwin-Williams Paint Company in 1921. He worked up to Manager of the Dealer Division, before being appointed Vice-President of Martin-Senour, Sherwin-Williams' struggling subsidiary. Thus when Mr. Stuart decided to launch a research program which would make better paint color "available," he viewed it as a matter of merchandising as well as artistry. "Carl Foss, a color physicist, joined our project in 1939. We arrived at a group of basic pigments which are called 'organic colors,' and were on our way to a mechanical dispenser which would enable the dealer to sell a variety of shades from this basic stock.

"Then the war came. Priorities meant no metals for such purposes. So we rigged up a sort of woodshed model out of old cans and bits of pipe and the like, and were convinced the idea would work." At the war's end two fully operable machines were constructed, and work they did. The Nu-Hue Color System, as it was christened, was demonstrated in 1946 (the year Mr. Stuart became president of Martin-Senour): a mechanical dispenser which could produce 1000 colors in three finishes with laboratory accuracy, from an inventory of only six colors, black and white. It was easier and surer than mixing cokes at a soda fountain. Today there are nearly 1000 retail mixers, bought by dealers and stocked by Martin-Senour. Seventy per cent of the company's paint is sold for home use.

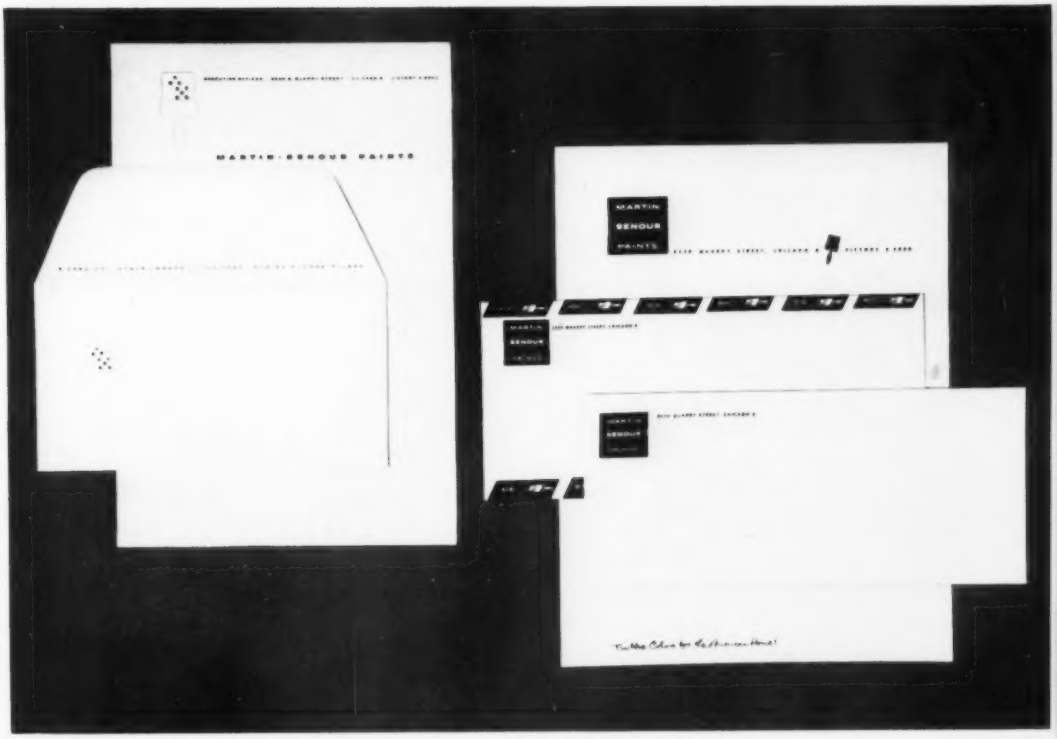
The Custom Color system certainly did its share to sell color—to the untutored consumer who wants subtle shades he won't have to mix himself, as much as to the decorator who wants to specify a color she's sure the painter can buy. But it would have been wholly untypical if Mr. Stuart had rested with that. He had refashioned the product and was proud of it,

Above, center: One of several company greeting cards developed with the visual identification program.





Secondary trademarks and visual symbols were created for special lines and products: the sunburst signifies the fade-proof quality of wood stains and "Colorsol" paints.



One of Goldsholl's unique uses of the color brush was to emboss it on executive stationery (left). He helped coordinate all the company's printed matter — mailing labels, office forms, checks, invoices, bulletins and memos.

and wanted to redesign the company to go with it. There was a practical reason for this: Custom Color had sold the idea of color not only to consumers but to other companies, and Martin-Senour suddenly had to cope with point-of-sales competition.

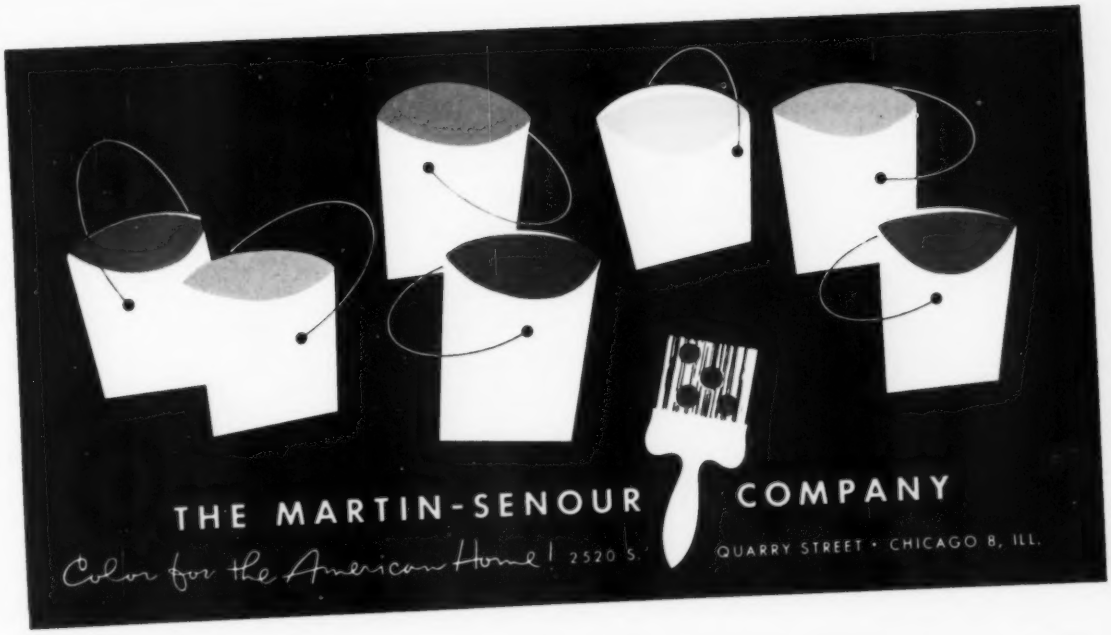
"The trouble was, we hadn't had much contact with designers except in display and advertising, and commercial art was entirely too codified for what we wanted—which was character." Since no aggressor of the design world had sought him out, Mr. Stuart had no choice but to find his own man for the job. A series of recommendations led him to Morton Goldsholl, a Chicago designer with a championship array of graphic awards.

The task presented to Mr. Goldsholl, if difficult in scale, was simplified by its inherent latitude: to give visual identity to everything that even vaguely suggested "Martin-Senour." He went to work first on the color cards—the counter top ambassadors of a paint company—and came up with a new idea: a card which had the color chips along the edge, where they could be matched directly to furniture or fabrics. The trademark color brush, which clearly and handsomely identifies most Martin-Senour products, evolved then.

Color, not an unlikely means of identification, was the theme of the designer's work. For instance, he created a tri-color stripe for indoor and outdoor signs, its particular shades of red, green and grey selected for both their permanence and contrast with white lettering. Mr. Goldsholl reviewed everything from displays to stationery, color files and labels, and brought forth a variety of symbolic ideas, each one appropriate to its special use but tied to the larger aim of coordinated company identification. He even turned out company Christmas cards when the season demanded. Perhaps the ultimate integration of designer's work and client's need is a spiraling chrome paint swirl topped with a tiny color brush, which clips together the folding money in the president's pocket.

"It was a twelve-year overhauling in anybody else's book," says Mr. Stuart, "but we were delighted with the results and pushed it through in two years. It has been particularly successful with the dealers—the quality of our identification helps our reputation, which helps them sell paint."

And there seems to be no end in sight. There's the new color dispenser, for instance, which automatically produces some 2,000 colors. There's the Neu-tone palette, which provides 144 colors by adding tube colorants to ready-packaged paints. And, Mr. Stuart adds, "This is just the beginning of modern paint merchandising. Just wait until you see what's *going* to happen."


THE MARTIN-SENOUR COMPANY
Color for the American Home! 2520 S. QUARRY STREET • CHICAGO 8, ILL.


MARTIN SENOUR
House & Garden
Colors for 1951

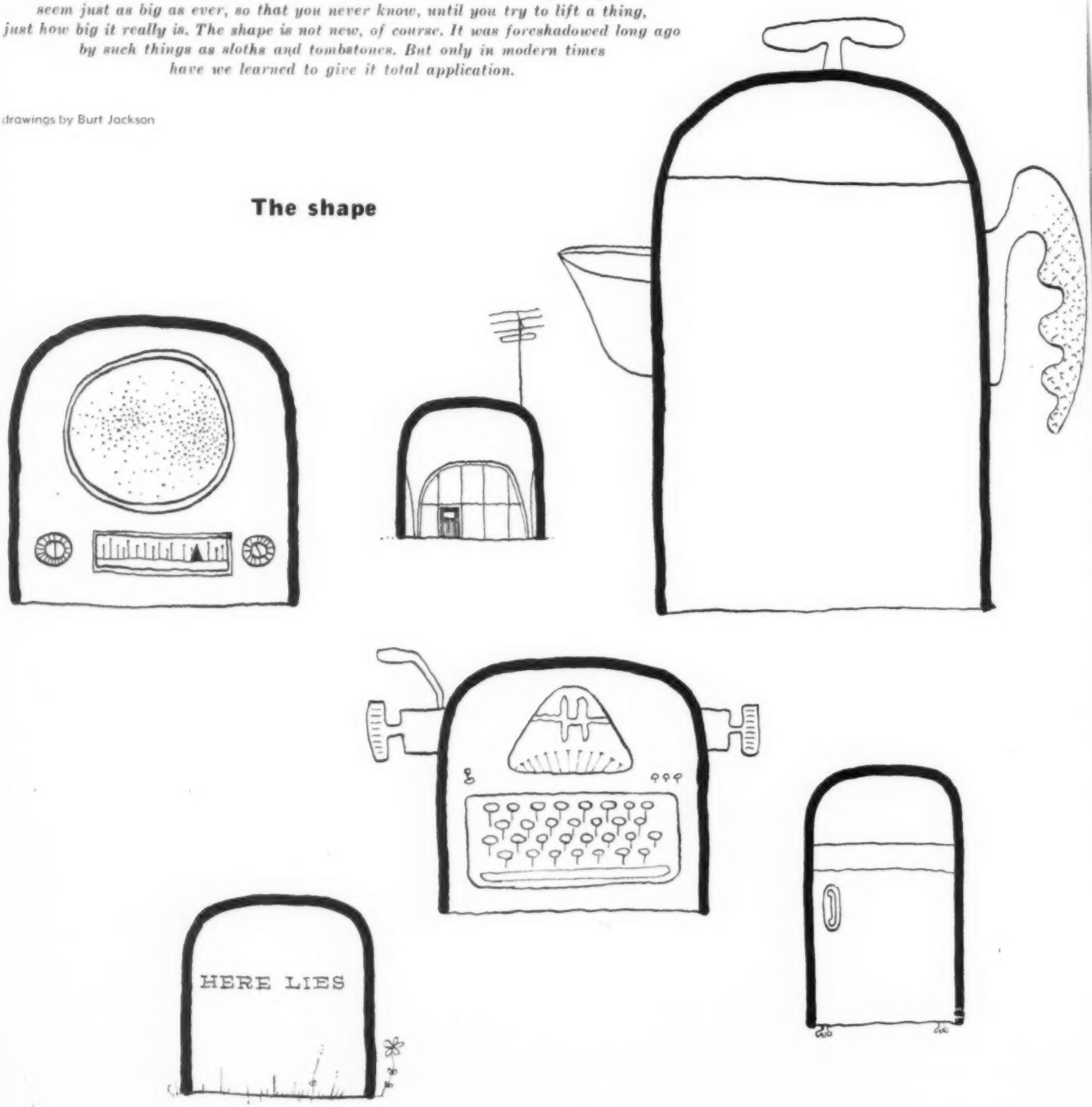

can you "visualize" color?

TRIUMPH OVER SCALE

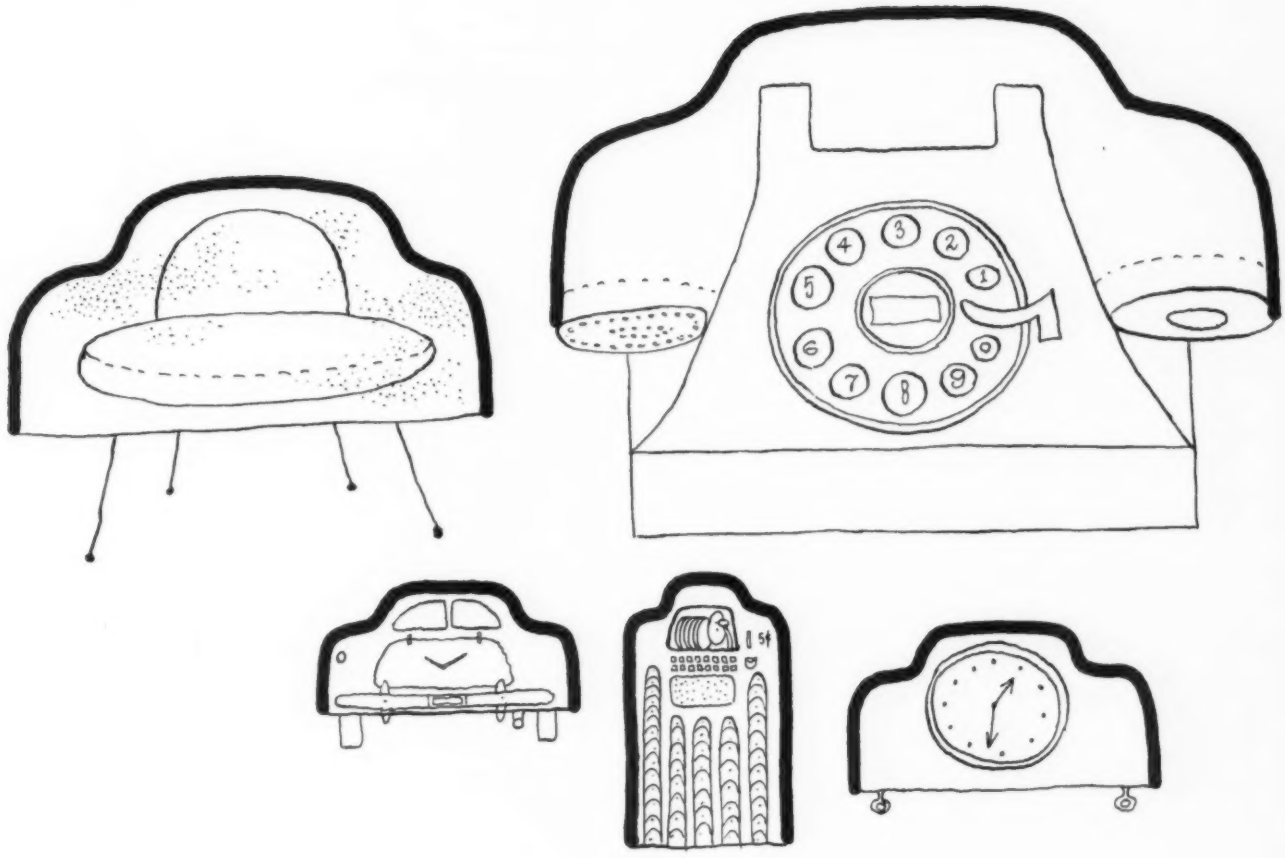
Until very recently almost everything was either big or little. This was unfortunate because it made little things seem little and insignificant, and big things seem big and clumsy. Modern design has solved this problem with what is best described as "the shape," a sort of shroud with an interstellar touch. It makes little things seem much bigger than before and big things seem just as big as ever, so that you never know, until you try to lift a thing, just how big it really is. The shape is not new, of course. It was foreshadowed long ago by such things as sloths and tombstones. But only in modern times have we learned to give it total application.

drawings by Burt Jackson

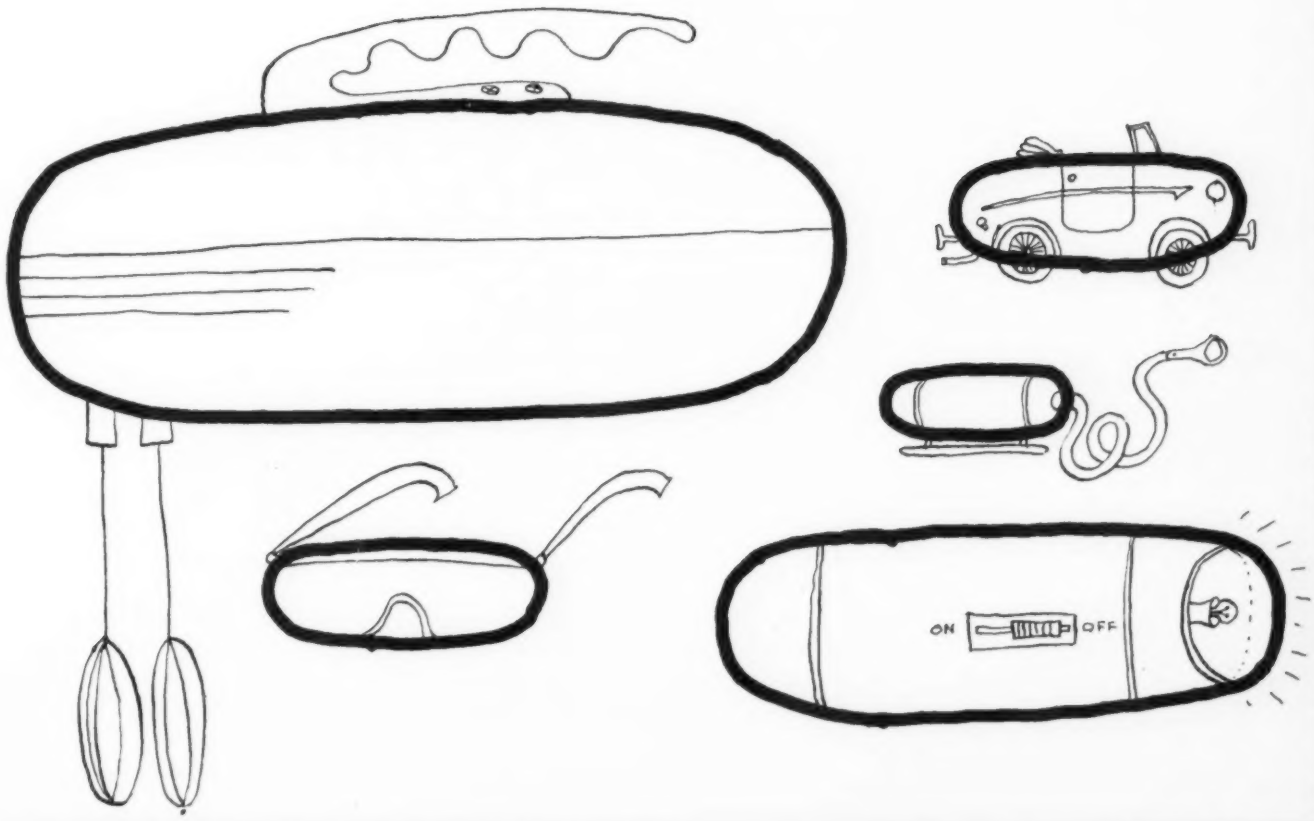
The shape

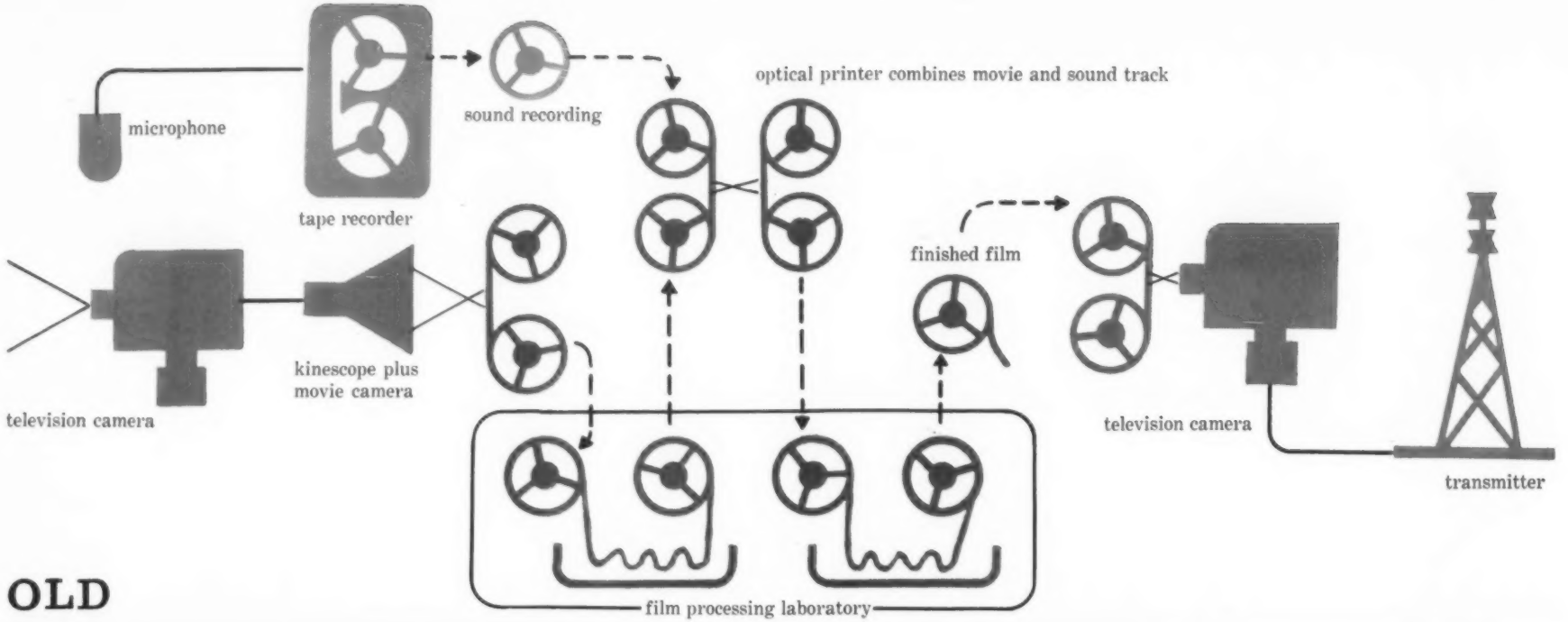


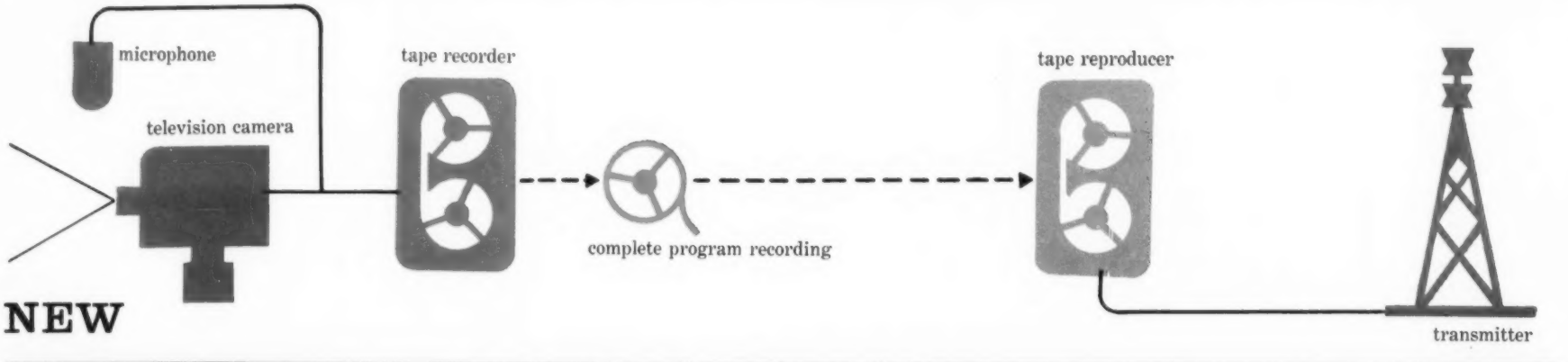
The shape with outriggers



The shape aloft







TELEVISION EQUIPMENT

FILM EQUIPMENT

TAPE EQUIPMENT

TV ON TAPE

where will it lead?

Since RCA first demonstrated the magnetic tape recording of television in December, people inside and outside the industry have been assuming, without leaning too heavily on speculation, that TV broadcasting is in for a revolution. As soon as the system can be put into production, it will mean vast economies and a greatly simplified method of recording and rebroadcasting programs. There the matter could end. But will it? Or will "electronic" photography stir up a revolution of its own which could upset all the recording industries from film to phonograph records? Looking at some of the implications of the new system, it is hard to see what could stop it.

The magnetic recording of sound on coated plastic tape is already a well-known and standard process. It has been apparent, since the development of magnetic recording, that the system is particularly suitable to recording data in a fixed time sequence. The tape's constant speed of travel supplies the time base; to form a permanent and handy record data need only be turned into electrical impulses of varying intensity and delivered to the tape in proper sequence. Tape recording of music and other sound is a relatively simple process, since sound consists of pulses of varying intensity and frequency. Ways of reproducing these impulses electrically and reconverting them into acoustic energy are now part of radio and phonograph history.

Theoretically, it has always been possible to record on tape the electric current that makes up the television image. (The image on the television screen is actually a mosaic, created by a rapidly moving beam which recreates one tiny area of the picture at a time.) There has been one stumbling block: the inability of magnetic recording to handle the high frequencies. In order to create an image on the screen which appears complete, television signals include frequencies up to 4,000,000 cycles per second.

Standard sound recording tape moves at 15 inches per second. If the width of the gap between arms of the horseshoe magnet (the head that does the recording by contact with the tape) is only 1/1000 of an inch, simple division shows that no more than 15,000 individual impulses can be recorded side by side in one second. This is the upper limit of human hearing anyway, so such a range is quite adequate for sound recording. But television, as a result of this limitation, has never been recorded electrically. Television programs, it should be pointed out, are seldom transmitted directly from live shows, even when it is technically easy to do so; most programs are recorded on film, for the convenience of editing and timing as well as for rebroadcasting. On top of the inevitable expense and time involved in the clumsy process of making these films, there are two drawbacks: there is no way of viewing the action that is being recorded while the original program is in progress; and if a film is being made from that broadcast, it must pass through a special piece of equipment which combines a moving picture camera and television screen (kinescope) in order to be transmittable at some later time.

The RCA tape recording system results from two main changes in recording technique. First, an improved magnetic head captures much higher frequencies at a given speed of tape travel. Second, the tape itself travels faster. (The tape in the demonstration traveled at 30 feet per second, or about 20 miles per hour, which is about 48 times the speed of present sound recording tape.) With these combined changes, it is possible to handle the high TV signal frequencies on tape—as well as to eliminate innumerable steps between the action and the transmission. At present the tape reels are enormous and run only four minutes each, but even so the process is considerably cheaper than film recording. Lower tape speeds, and small reels, will no doubt come in due time.

What are the future directions of electronic photography? Theoretically, action of any sort — sports, drama, full-length films—could be recorded electrically and shown on giant TV screens in theatres, as movies are now. But for a while, the poor quality of the projected television image will insure the survival of film for commercial, non-television use. This poor quality, however, is largely due to the coarse "raster" or grid of lines of light that make up the picture. There is no reason why the pictures might not eventually have as fine a quality as printed photographic half-tones. When this happens, tape seems certain to replace film for movie photography, which means that the movie camera and the projector would inevitably disappear too. The invention which could turn this fantasy into reality

Mr. David Sarnoff, R.C.A.'s president, holds the recording tape from the apparatus developed under W. D. Houghton and Dr. Harry Olson of the Princeton Laboratory.

—by converting the present TV recording system into a means of photographing live action—would be a new electronic combination of known parts: a TV camera plugged into a tape recorder. With it, even an amateur could capture both sound and light, and could carry the tape home and project it immediately on his television screen. If made sufficiently compact and cheap, "sight" recording equipment could invade the home and possibly replace the entire phonograph, TV, recording unit, camera and projector combination. And if "canned" tape were developed for home use in a separate or integral playback unit, it might mean to television viewing what records mean to radio: free choice and no commercials.

Other visual data can be recorded electrically too. The same equipment could, if anyone wished, record books, magazines and newspapers on a kind of tape microfilm to be read at any time on the family television screen. Such Brave New Worldish visions seem very remote in view of the present bulk and complexity of the experimental equipment. But today's rapid progress toward smaller and simpler electronic equipment suggests that such ideas are not just idle speculation. Portable radios seemed fantastic in 1920!—*J. P.*

The designer's stake in The Changing American Market

Mass buying power is now in the hands of a new group of consumers. Who are they, and why do they buy?

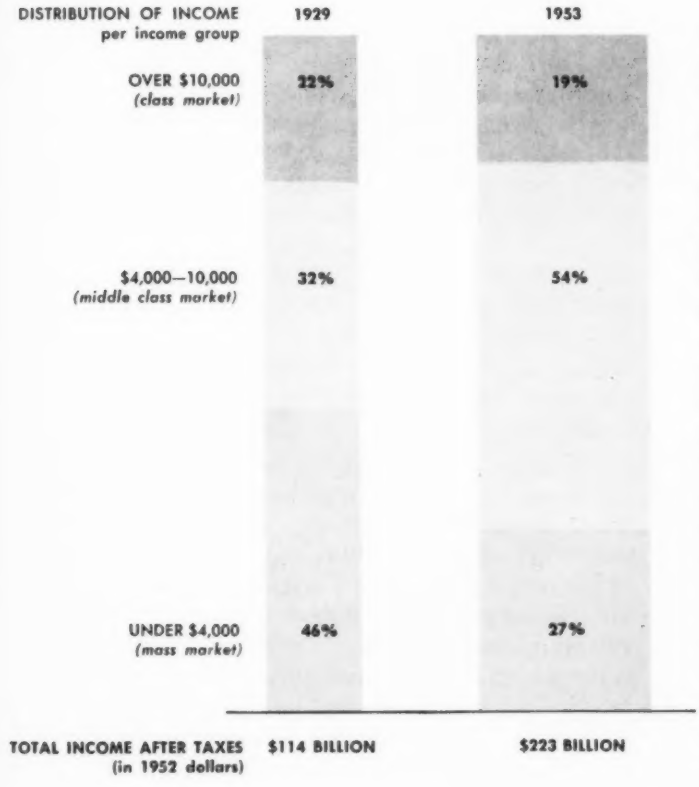


photo: Edward Gallob

by Stan Wellisz

Probably no phrase is so universally glorified and generally misunderstood in American business as "mass market." The reason is not hard to uncover. Our economy works on the premise that it is better for everyone concerned if the vast majority is able to buy any product that is made, so the men shaping and selling products have come to this phrase — indeed concept — to describe their business objectives: the mass market, the largest number of consumers with similar enough tastes to be attracted to any given product.

Because mass-production needed the masses, as well as vice versa, "mass market" has long been a kind of constant from which design deviations could be calculated with a certain amount of cautious regard for consequence. This constant has not always referred to income level alone — although 30 years ago almost half the U. S. population was in low income brackets and "mass" was indeed synomymous with poverty. Originally it referred, also, to a typical manner of living which distinguished the Haves from the Have-nots, so a sizable piece of the "middle class" could, by the nature of their purchasing power and tastes, be lumped with the Have-Nots. They had no money for Cadillacs, yachts, swimming pools, or any of the luxuries which would have admitted them to the ranks of the Haves.

It was, in short, a two-class market, with a vast gulf between them. The businessman had to choose sides carefully: would he aim for the rural and urban multitudes with tight budgets, fixed living habits, limited education, and rather dubious if uniform tastes, or the tiny but powerful class market, with education and cultured tastes and the wherewithal to satisfy them? The result of this necessary choice has been reflected in products on the American market since the end of World War I.

As anyone dealing with consumers, individually or in aggregate, undoubtedly knows, this picture has changed markedly in the past 25 years, drastically in

the past 8, and its effect on business' thinking about product design has been nothing short of revolutionary. Not only have the old stereotypes about mass and class proved hazardously inaccurate, but it has become clear that no stereotypes about the American economic scene, even based on today's certainties, will be very reliable in the future.

As the series of articles on "The Changing American Market" currently appearing in *Fortune* magazine brings out, the most constant thing about the American market is that it is ever-changing. It obeys no rules but those of social dynamics, and anyone dealing with Americans as a mass will do well to consider them first as people.

The big change of recent years has been taking place in three major areas, according to *Fortune's* survey, and from them a number of specific conclusions about the future of the market can be drawn: 1) Changing population patterns 2) Growth of a new mass-market, the middle class market 3) The rise of suburbs in place of rural and urban markets.

Population wave

Since the end of the war, the economy has been riding the crest of a population wave. New homes were needed to house the 2.1 million couples wed annually. New appliances went to equip the new houses, and to replace outmoded ones in many cases. Labor saving devices were snatched up by maid-less couples with growing families. There was a conspicuous boom in the baby market — carriages, clothes, toys and baby foods. In 1953 there were 60% more children under 5 than there had been in 1941, and their parents had more money to spend on them than ever before. The consumption of canned foods —more expensive but vastly more convenient—rose from 131 lbs. per baby under 3 in 1941, to 153 lbs. last year, and the baby food industry netted a nice $180 million.

What was the cause of the post-war population boom, and what does it augur for the future? Part of it can be traced to depression and wartime postponement of marriages and babies; part of it is the result of younger marriages. These are temporary factors, and the effects will taper off. But another and more permanent part comes from a marked tendency toward larger families. The crude birth-rate (number of births per thousand) was 19 at the depth of the depression; it has not fallen below 23 since 1946, and in 1947 it reached 27 — close to the rate prevailing before World War I. Families now have 47% more first children, 91% more second children, 86% more third and 61% more fourth children than in 1940 — in short, lots more kids.

What's more, these children are now occurring in families that can better afford them; formerly the lowest income groups had the largest families. And there is no sign that the larger ideal family is shrinking again, so we may count on a sustained demand for larger homes, bigger refrigerators, and more labor saving devices to help the middle-class mother with her bigger brood.

The next decade

The market of the next ten years will not be the same. As these families and children grow up, demand for new homes and baby food will slacken, but there will be increased call for children's durables, appliances for maturing families whose income is rising, and convenience items for older people. Because the backlog of marriages is now caught up (there are fewer unmarried women over 16 than ever before) and because families which doubled up during the war have now undoubled, fewer new homes will be built. There will be fewer marriages too, because young people approaching a marriageable age belong to the small generation of the depression when U. S. birthrate was at an all-time low. There are now 400,000 fewer young people between 10 and 19 than there were in 1941. Until 1965, when the first post-war babies reach the altar and a new population boom gets underway, there will be fewer marriages and babies than there have been since the war.

This means a drop in new household formation—the backbone of the entire house-goods market—and increasing competition in appliances and furniture which is already beginning to be felt. The picture looks a little more rosy, however, when seen in terms of the potentialities of the market that will exist—the maturing family. As the young postwar couple grows older and more affluent, it will be able to afford better and more expensive goods. The needs of the growing boy or girl are more numerous than those of the infant. There may be fewer cribs and jars of baby food sold, but the nation's food bill will go up, because a child of six needs twice as many calories per day as an infant, and a boy of 17 eats more than an adult. Thus, though baby carriages and toys may hit a temporary slump, increased sales of bicycles, sport goods, children's furniture and school supplies will more than make up the difference. The older population should not be forgotten. There are now 41% more people over 60 than in 1941, and 21% than in 1947, and in everything from easy, compact kitchen equipment to the dream retirement house, to the fishing gear and Florida clothing, they are potential buyers and users of products.

The postwar population boom might have passed without consequence to designers, were it not for the fact that more people had more money and were

spending it more willingly than ever before. Because that money was more evenly distributed than in any previous boom, the pattern of spending was vastly different. The gulf which separated the wealthy middle-Atlantic states from the poor Southwest in the 1920's and '30's has almost disappeared. Thorsten Veblens' leisure class is no longer lighting cigars with $10 bills, nor are residents of Tobacco Road dominating the scene.

Decline of class and mass

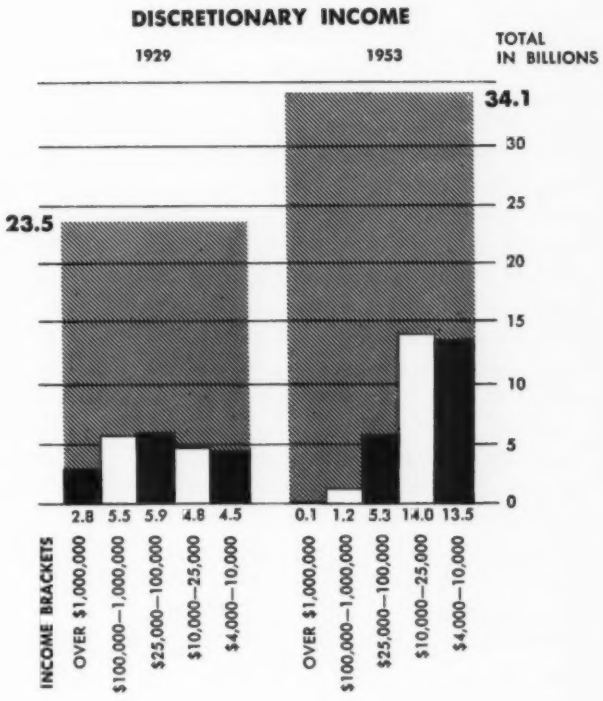
Out of these shifting boundaries has emerged a new market phenomenon—the vast one-class middle class market. Its importance is most easily measured in terms of income distribution. In 1929, 46% of total U. S. income went to families earning less than $4,000 (in 1953 dollars). Today such families receive only 25% of the national income. In other words, there are fewer people in the lowest group, and those who are in it are wealthier. Only 10% of American families earn $1,000 or less each year, against 16% in 1929, and the under-$2,000 group has almost halved. At the other end of the scale, the top 1% of families which received 18% of income in 1929, got only 8% of it in 1946. What is left in the middle is a large slice of the income pie: people in the $4,000 to $10,000 bracket who earned 32% of the national income in 1929, and last year earned 66%.

The mass market of 1929 was a market for cheap goods, and the best a designer or producer could do was to offer the cheapest possible imitations of the custom-made items which the class market purchased The market of 1954—and 1960—has a new regard for quality. While the demand for very high priced goods has dwindled, many more people can now afford to think about quality products; when they do, they think hard, and insist on getting value for their money. Thus quality has less connection with high price, and more meaning on its own terms.

This big new market, then, is the mass-market redefined—the mass which is no longer synonymous with lowest incomes. Education and better pay and new social habits all contributed toward making this market a unique opportunity. Goods designed for it cannot be extravagant, for middle-class income still permits little of that; but they can be well-designed, because buyers are likely to judge things as much on their merits as on their price tag.

Luxury and choice

The introduction of *choice* is one of the more vital features of this market group. The low-income customer has little choice in the way he spends his money; all of it goes for "necessities." But the middle-class shopper, who is above the poverty line,



suddenly finds himself in the position of a discriminating buyer. He can afford to make a choice among certain thing he wants when all the necessities have been taken care of—which brings in the matter of "luxury." Will it be a freezer, hi-fi, or a bar-b-cue? Because his choice can be swayed by the relative desirability of these items, a man with moderate "discretionary" income is one of the big targets of better product design.

The line between necessities and luxuries—or discretionary purchases—is a hard one to draw, of course. A necessity in one occupational or social group may be a flagrant luxury in another. The worker and the university lecturer earn the same salaries, but their needs in food and clothing are vastly dissimliar. A corporation lawyer feels he must live in the right neighborhood and drive a respectable car—"necessities" which seem far from urgent to lots of other people. Then too, today's luxury may turn out to be tomorrow's necessity. The necessity level is constantly rising in the American economy, and it is not surprising that *Fortune's* survey shows that money available for luxuries goes up slower than the level of income. According to *Fortune*, families with $4,000 or less per year have no discretionary income. As people rise above that level, expenditures on "necessities" increase less rapidly than the income itself. If income becomes more evenly distributed, as it has in the last twenty years, there is less money for "luxuries," but just as

much non-necessity buying may be going on.

This is because the luxury purchases of 1953 have nothing in common with the luxuries of thirty years ago, except the name. The small pleasure craft costing $10,000 or less has nosed out the yacht which ran to hundreds of thousands or millions. Few people now import "Gothick" castles stone by stone from Europe, but large numbers buy phonograph records. The mllion-dollar incomes, which totalled $2.8 billion divided among 1312 individuals in 1929, have shrunk until only 70 individuals now fall in the million-dollar bracket. Together they earn (after taxes) $100,000,000 a year, hardly an appreciable part of the $34.1 billion "luxury" market.

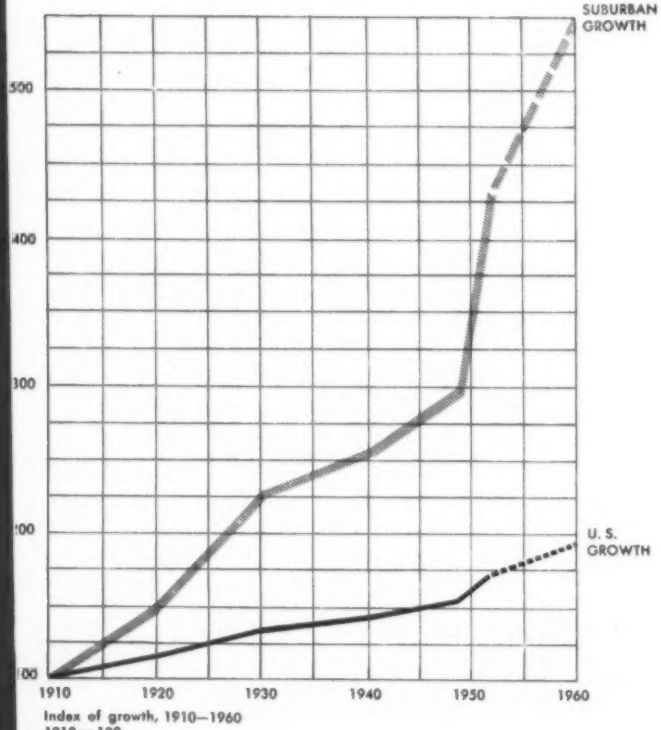
The challenge of this new luxury market would seem to lie in producing ever more attractive goods with the price advantage of mass production and the quality appeal of their hand-made predecessors. As the custom-built limousine and the hand-tailored suit fall out of reach of even the upper-bracket buyer, they are replaced by high-quality mass-produced cars and clothes which he and the middle-income customer alike can afford. In this filtering down, luxury becomes necessity, and the standard of living jumps another notch. Today's low-priced cars, for instance, compare favorably with luxury vehicles of 20 years back, and they come in many more models to suit varied needs and tastes.

Though its definition is changing, luxury market prospects are good. In 1929 41,300 families with $100,000 or over disposed of more than a third of the nation's luxury income. By 1953 that group's share had shrunk to 3.8%. The bulk of discretionary income is now concentrated in the $5,000 to $100,000 bracket, which has 31 billion dollars to spend after necessities have been purchased. This money is vulnerable to portable radios, wrist watches, colored sauce pans and shop tools, as well as sports cars and mid-winter vacations. What is more this group is bound to grow larger, and increased productivity will bring more luxuries to the middle-class customer.

This looks very sunny indeed, for the continued prosperity of luxury products, but there are a few clouds. Luxury purchases can be postponed; necessities cannot. When income dips, as it has in the present recession, luxury items and consumer durables are the first to feel the pinch. Purchases of food and clothing can't easily be cut, but families will find ways of doing without a sailboat, and making do with the old refrigerator for another year.

With every dip in demand for consumer durables, manufacturers become more aware of the competitive value of design—not merely appearance design, but radical remolding of functions and concepts. This is already noticeable in the appliance field, where the spectre of saturation has brought forth a rash of "kitchens of the future," lavishly designed from doorknobs to deepfreezes. *Fortune* estimates that the growth of appliance sales from 1955-59 will be only moderate, largely in replacements. To hold the market at all, the industry knows, consumers will have to be persuaded to replace their still serviceable machines; the products that do the persuading will have to be measurably improved. But, *Fortune* admits, unless the industry has been playing its cards close to the vest, there is nothing on the kitchen appliance horizon as promising as the early air conditioners were, and what lurks beneath the pushbuttons of the future seems to be largely the same old equipment.

U. S. POPULATION and SUBURBAN POPULATION



Index of growth, 1910–1960
1910 = 100
dotted line shows projected trend

Suburbia revisited

All of the postwar buying was tuned to a new mode of living which combined the outdoors and indoors, formal and informal, display and utility. The moving force behind it was the growth of suburbia, which is in many ways tied to the changing income levels and the growth of the middle-class market. The trend to suburbia started way back in the '20's, when the car made commuting practical for numbers of city workers. The migration was checked temporarily by

economic conditions in the '30's, but in 1947, with the housing shortage, lifting of building restrictions, and higher income in many groups, the boom actually began. The suburbs combine the advantages of owning a home (most suburbanites do) and space for children to play, with commuting to the city where salaries are good and shopping unlimited. Because most people find this combination a good one for raising families, suburban couples have more children than those in cities. And they have money to spend: 60% of them earn over $4,000, and 25% over $7,000. There are 10.4 million suburban families—some 30 million people to feed, clothe and equip.

Suburbia has meant an almost total revolution in living habits. Most of the millions of new homes, however conventional on the outside, have been influenced by the open plan of modern architecture, which has introduced a kind of informality never before known on such a scale. Because rooms for entertaining and rooms for work often adjoin or merge, the guest no longer sits in the parlor but looks into, or eats in, the kitchen. The natural result has been a demand for beauty at the utility level—presentable everyday dinnerware, utensils that look well on open shelves, pans which can be carried to the table for serving. This, indeed, has meant a major re-alignment in the housewife's attitude toward all her household possessions; as utility and beauty could be had together, demand for pure display items —inlaid pianos or silver tea sets—declined, because suburbia frowns on show-offs and discourages conspicuous spending.

Upheaval in furniture

Look at the furniture market which blossomed as this resurgent middle-class was tearing down the industry's established notions of what class and mass want. The old prewar mass lines, grim overstuffed "borax" monsters, have largely disappeared. American homes are filled with furnishings the likes of which were never known before—wrought iron, plywood, foam rubber and fiberglass, furniture with new forms and new practicality.

This change, and it has been a radical one, has been primarily the result of design. Before the war the furniture industry paid little or no attention to design, but today, *Fortune's* survey indicates, almost every one of the 4,000 furniture houses uses designers on some basis. Probably their major contribution has been furniture for the modern market which is well-suited to mass production; as chairs and tables poured off the assembly line, prices went down; people found attractiveness, value and suitability within their reach. Replacement sales as well as sales to new homes jumped.

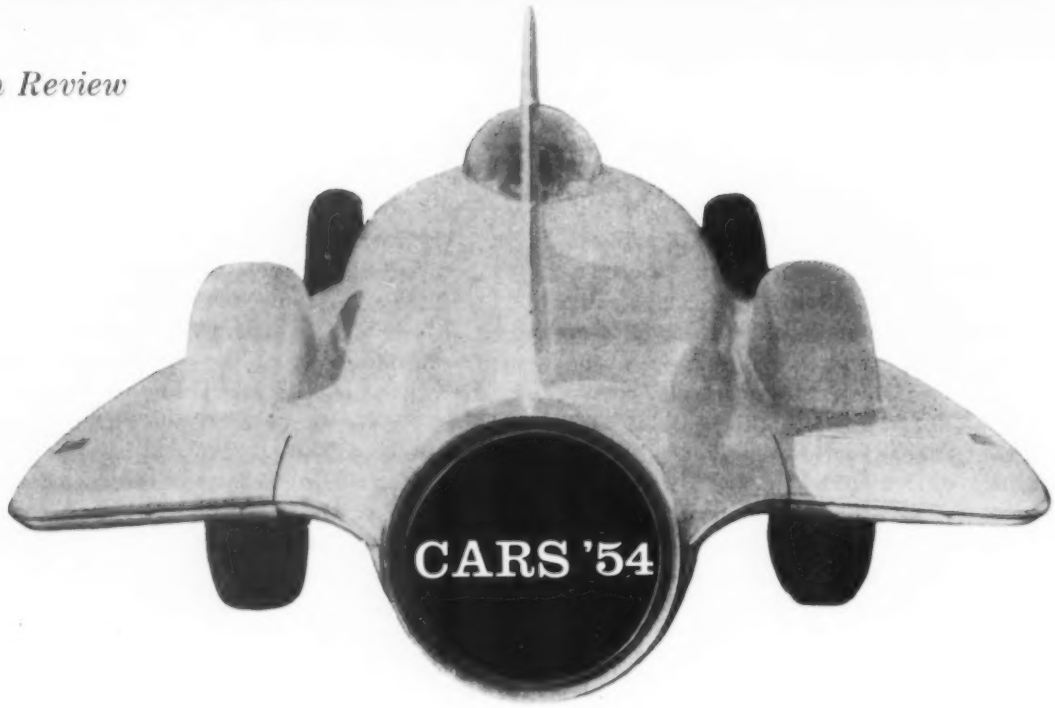
The furniture market, as *Fortune* points out, is essentially a replacement market tied roughly to a ten-year cycle. New household formation in 1955-59 will tend to speed the cycle up slightly, as will replacements for the heavy postwar buying spree, but it won't be sensational. If any major design alterations appear, they *could* have a definitely sanguine affect on the total for the next decade.

The suburban supermarket, product *par excellence* of suburban living, is an interesting lesson on the importance of familiarity and availability. *Fortune* surveyed purchases made by supermarket shoppers, and found that the majority of high-margin items were unplanned purchases. Things like jams, confections, preparations, perhaps by virtue of their packaging, just happened to catch the shoppers' eye and she bought them without premeditation or strict need. The same has been true of ice crushers, contour sheets, magnetic can openers—each one in its way a better mousetrap which caught the consumer unaware but willing.

Anything goes

That no market rules are inviolate is well demonstrated by the pattern of food buying in the past years. One of the basic laws of demand says that rising incomes are followed by a dropping proportion of money spent on food. Americans, again, have defied the rules. Between 1940 and 1953, the proportion of U. S. incomes spent on food increased from 24% to 29%. Some of this went into higher prices, but a good part of it went into quality and service: the housewife discovered that processed and packaged and frozen food were worth the extra cost, and decided to pay for them.

Over and over again the American consumer is showing his disregard for pat economic theories and going his own way within the larger social pattern. He is never standing still, and by the time large sectors of American business pantingly catch up with his yen for chrome or wrought iron, he may have passed on to something which suits him and satisfies him a good deal better. To the conservative whose habit it is to study market demand as a *fait accompli* and then slavishly follow it, these facts may prove more than unsettling, particularly in the days of tough competition. To the more adventuresome individual, who can look at the size of the market, its regional character, the distribution of income and the lives of the people who make it up, then draw some conclusions about its potentialities, there is a good chance of creating products which create their own demand. That is what is happening when the consumer is heard commenting, "I'd never thought of that—but it's exactly what I've always wanted."



The most successful company in the history of the world makes automobiles: in 1953 General Motors sales totaled $10,028,000,000, an unheard-of-sum. Under the circumstances, passing judgment on a new crop of cars is a little like passing judgment on a nation's soul.

In the American automobile industry the idea prevails that engineering progress must be symptomized by visual changes which, simply because they are changes, constitute improvements. As any designer knows, a good design retains its excellence despite later innovations; so progress in automobile design can easily mean one step forward, two steps back.

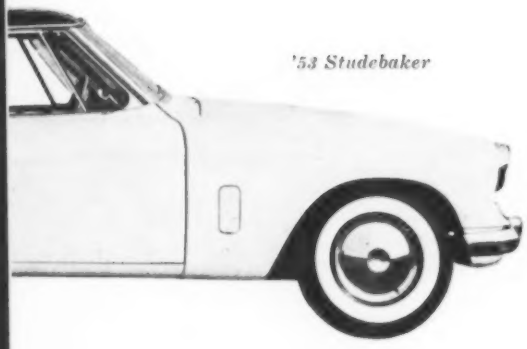
One of this year's forward steps has to do with visibility. Until the advent of streamlining in the mid 'Thirties no one paid any attention to visibility because it was always excellent. The motorist sat high and contemplated the world through big vertical panes of glass. But it's not so easy to give visibility to a man comfortably ensconced in an easy chair amid stylish sheet metal air foils. By now "bad visibility" is a symbol for the complaints against the modern American streamlined car with its skirted wheels, wasted width, and difficult access. The American manufacturer's answer, naturally enough, has been *new improved* visibility.

Another step forward this year is the American manufacturer's long-awaited obeisance to European sports car design. This is quite a step. The world's biggest corporation, after all, must have some idea of what its clients really want in an automobile. The origin of love-of-sports-car, our manufacturers perceive, lies in the appeal of luxurious, impractical automobiles to the imagination of people who can neither afford nor use them. It indicates a demand for more "glamor," a fleeter and more

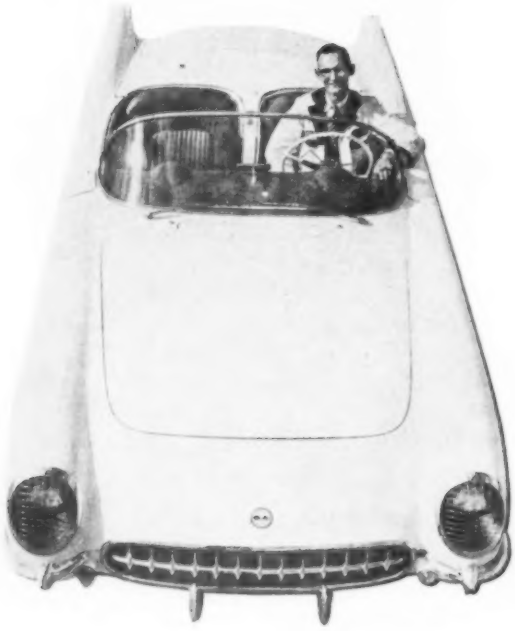
voluptuous character in domestic design. Since glamor and fleetness are *the* American ideals (aside from roominess and comfort), it isn't too hard to rewrite the European design program in American terms. American manufacturers offer the sports car as the car of the future toward which present design tends. In the "experimental" car, American styling innovations that would need consumer testing anyhow are nicely displayed, while the impractical aspects of European sportscar design are carried to such an extreme as to prove once and for all that they are un-American. Thus the threat of the European imports (it is no threat at all) serves publicity and education at once: the sports car, though intriguing, is absurd; even if you wanted one Detroit could do it better; in fact, they're doing it next year.

A final group of steps for '54 are taken neither forward nor backward, but rather to the side. Stainless steel has replaced chromium-plated trim on the new Studebaker. Although it is not so bright, it does not chip or rust. Aluminum, long used in Europe because of its lightness and workability, is just beginning to appear in this country. The most revolutionary new material is the reinforced plastic used on Chevrolet's Corvette and the Kaiser Darrin. It seems best suited at present to small open bodies of this type and competes with steel only in a production of less than 10,000 units. But its toughness, its resilience, its sound deadening capacity, and the ease with which it is shaped and patched make it a promising material for the future. The chief drawback of this material is the possibility that under severe impact it will shatter into jagged slivers.

To distinguish fact from foresight, the sports cars and experimental models that appear on these pages are printed in ghostly grays.



'53 Studebaker



Chevrolet sports model

VISIBILITY

The best way to promote good visibility is to seat the driver close to the windshield and high above the hood. When the seat is moved back he is plagued by reflections and roof, posts, and hood loom as disproportionate obstacles to his vision. Since Americans have always regarded the automobile more as an art form than as a practical device, they accepted streamlining even though it meant lowering the car, pitching the windshield, and dropping the driver back in semi-comatose position. Attempts to improve visibility are likely to arrive as part and parcel of a new design program, and one can never be sure that improved visibility is a serious aim—even to the customer.

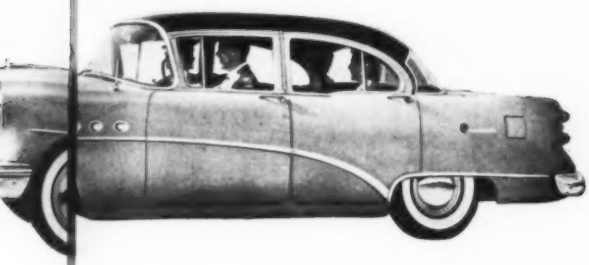
Although the admirable compactness of the modern V-8 engine makes it perfectly possible to lower the hood, the only car to do so is the Studebaker, which uses the advantage as an excuse for dropping the seat and roof for a lower over-all line. Thus the driver is in approximately the same position as always *vis-à-vis* the nose of his car. Other companies seem to feel that the effect of foreshortening achieved with a high hood and sloping body line is more valuable than increased visibility or a lower silhouette. The high hood is retained in most lines and is further endorsed in most of this year's experimental models.

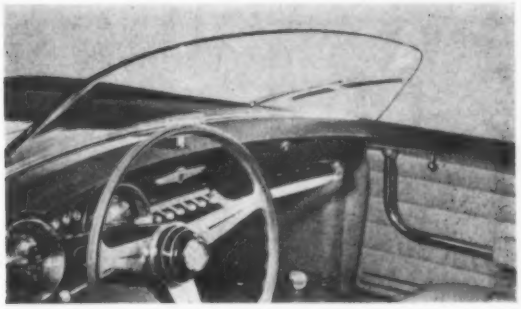
A second approach to the visibility problem is made possible with curved glass. The wrap-around window, first seen on the rear of the 1947 Studebaker, is introduced this year on the front of all cars in GM's three top lines. It naturally increases the glass area and is therefore supposed to increase visibility. Actually, to give real sidewise visibility, the windshield would have to surround the driver, thereby blocking his exit. To avoid this, the windshield is moved forward. Thus although the cornerposts on the new GM cars are somewhat further back than before, this advantage must be measured against certain drawbacks: the windshield is as far from the driver as ever; the curved glass presents distortions and reflections; the large glass area increases the capacity of the heat trap along the dash, and new windshield wipers are required to follow the curve. A moderately curved windshield placed close to the driver is more practical if less interesting.

Stylistically, the old backswept windshield post is a logical expression of forward motion. The wrap-around windshield, particularly when it is used with an upright post, as it is on all production models, is at odds with current streamlining. However, on an open car, where the windshield is self-supporting, the forward sloping post that appears on GM's experimental cars makes a strong and decorative line.

It is sometimes imagined that the driver of an automobile, like the pilot of an aircraft, would enjoy perfect visibility beneath a transparent dome or bubble. The experimental Pontiac "Bonneville" explains the folly of this idea. Since the driver of a car never needs to look straight up, there is no excuse for broiling him in a miniature greenhouse. Plastic windows have a slight weight-saving advantage, which has led to their use on a number of Italian sportscars, but they scratch and cloud too readily to meet utility car standards.

'54 Buick





In standard car driver is comfortably seated so far from windshield that corner post and roof are considerable obstacles (Nash). Low curved windshield of experimental car gives more panoramic effect, adds reflections, bisects line of vision (Dodge Firearrow).

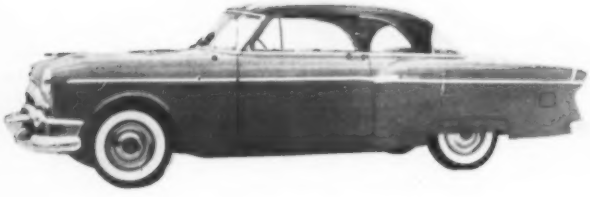
Pontiac's "Bonneville Special" increases visibility heavenward.

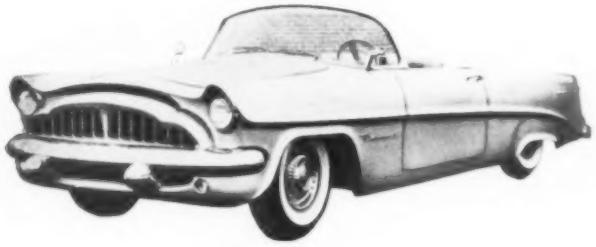
Ford's add-a-top Thunderbird shows that new windshield provides strong new line on convertible though it may not improve visibility much.

Panoramic back window does away with blind spot, but as experimental Cadillac shows, front and back windows are enlarged at expense of view outside.

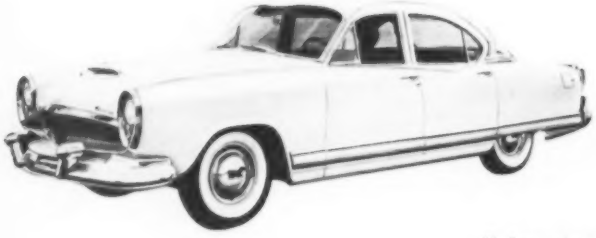
Chrysler's unflamboyant lines acquire old-world style in experimental K310 "coupe de ville," which eschews futurism, features unadorned body, cut-away wheels, old-fashioned grille and bumper. Long nose implies power; roof line implies convertability. By Virgil Exner, formerly of Raymond Loewy, and built in Italy.

Dodge shows less conservativism: standard maintains economical shape but bravely adopts postwar style of applying speedy chrome without regard for wheels or doors. Experimental Granada roars ahead with new wrap-around windshield, cutaway body line (see Oldsmobile), jet-inspired air scoops, and rudder.

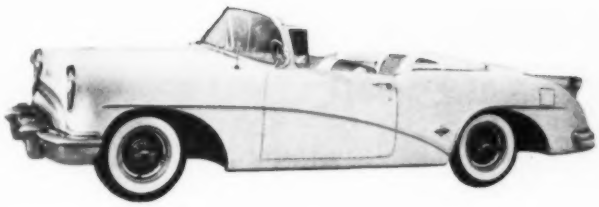




Packard, about the plainest car on the market, relies on sheer bulk for effect. The experimental Panther seats only two or three for all its size. It is unique in that it resembles a boat more than a plane. Its sharp shadow lines, taken with those of the Dodge Granada, suggest that a new style is in the making.

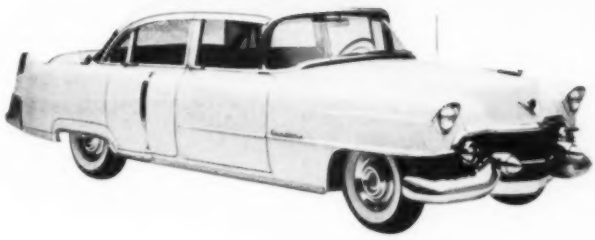


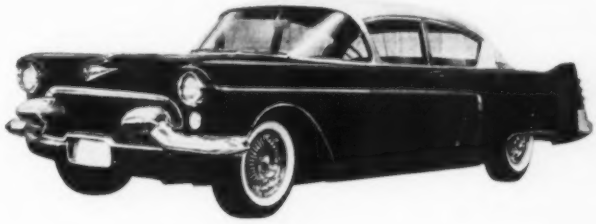
Kaiser standard has new front treatment, including hood air scoop. Sweetheart line on rear door, a trademark of designer Darrin, reappears on sleek new "Darrin," a production sports car that also features clip-on wire wheels, imitation spinners. Door slides forward into space English sometimes use for spare tire.



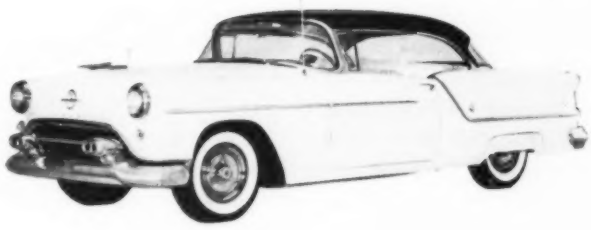
Buick convertible displays four wheels with unprecedented abandon, sports modest version of new GM windshield. Wrap-around windshield is apotheosized as a chin-height windbreak in experimental Wildcat II. Wildcat's sculptured, chrome-lined mudguard suggests new uses for chrome. Jet-like tail lights blister shell of both cars.

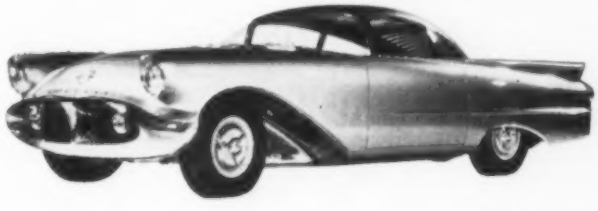
Chevrolet standard retains familiar body decoration and windshield. The Corvette, an American sports car, is the first production car with a plastic body, first two-seater since the war. It combines wrap-around windshield and jet-inspired tail with round wheel and headlight openings, fits small Italian grille with heavy teeth.





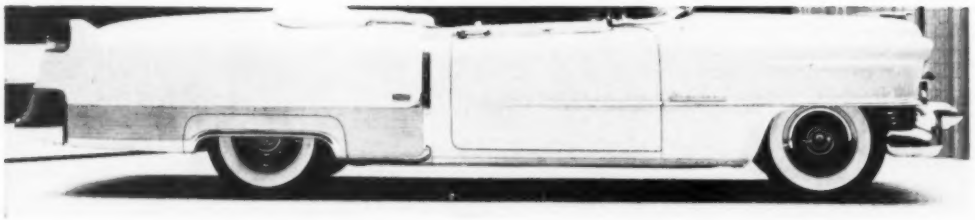
Cadillac standard matches wrap-around windshield with wrap-around grille, gains impressive length wth new gull-wing bombs. On experimental Park Avenue up-swept tail remains, bombs are combined with old five-tooth grille. Body treatment is simplified, with chrome tracing wheel openings. Roof is brushed aluminum.



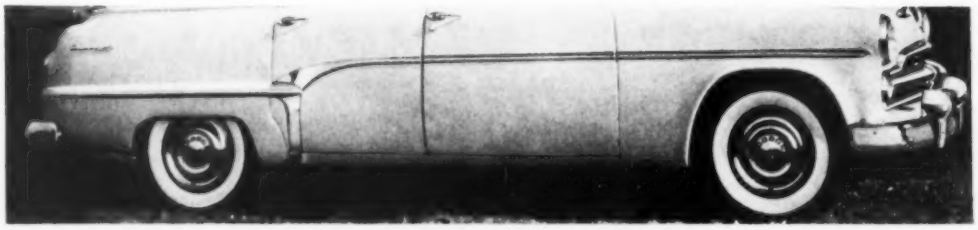


Oldsmobile borrows Cadillac's wrap-around windshield and bumper, tries out a new chrome dividing line across the flank. Experimental Cutlass masses chrome as a provocative lining for wide-mouthed air intake and wheel openings, predicts simpler handling of wrap-around windshield as part of bubble roof.

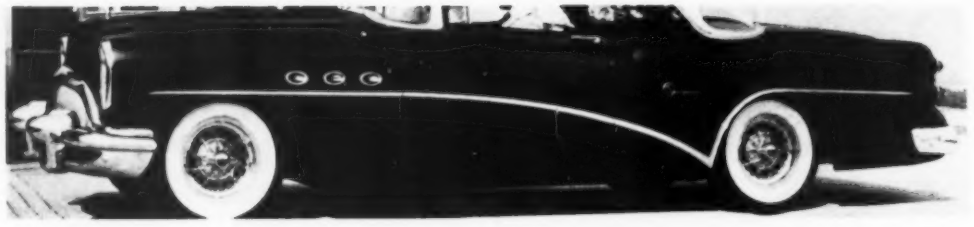
American stylists have sacrificed one of car's most useful and decorative devices, the wheel, to streamlining. Extreme wheellessness is seen in Nash, which seems to rest its body on chromium runners.



In absence of wheels, motion is suggested with decorations applied to body. Typical GM motif breaks Cadillac toward back.



Chrysler, usually conservative and functional, suddenly joins the opposition, slaps streams of chrome across '54 Dodge.



New Buick Super enlarges wheel openings to reveal sporty wire wheels. Chrome ignores structure, but is unusually modest.

Chrysler's experimental C200 suggests sportscar influence may help. Full quota of chrome is used to emphasize circle of wheels.

To what extent are the new cars really better than the old ones?

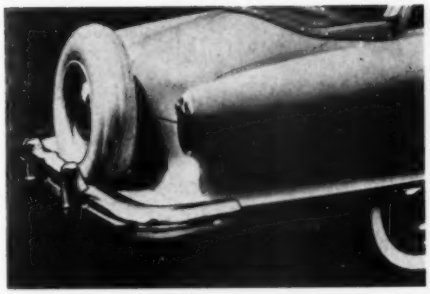
One of the American manufacturer's main criticisms of the European sports car has been that it is cramped and inadequate for family use. To the extent that family cars are made to emulate the racier lines of sports cars, they too become less adequate for utilitarian needs.

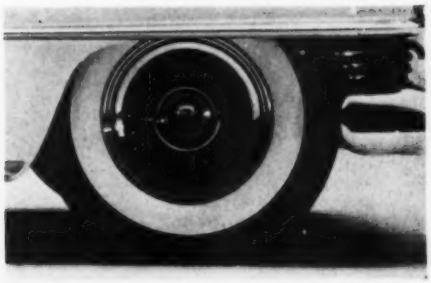
Since American automotive engineering has always emphasized comfort over safety, the construction of American cars has not been developed to a point commensurate with their high power and performance. A softly sprung car is not safe at high speed, nor is the conventional steering gear, designed to lighten the effort of turning the wheel, quick enough in an emergency. The American type of car, with its excessive weight, size, speed, and power, is potentially the most destructive in the world.

The streamlined shell that encloses the American car, while it gives an air of great size and power, renders the working parts inaccessible. The engine is within easy reach only when the hood is sloped. Covers over the wheels, aside from hiding the car's most emphatic shape, are a mechanical nuisance.

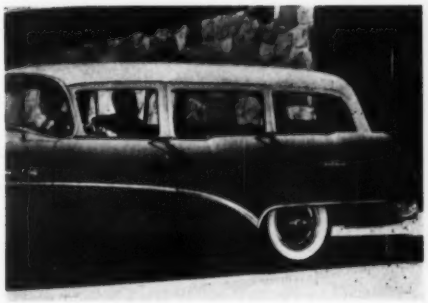
Such complaints are old, however, and if they mattered Detroit would answer them. The real point, in the '54 cars, is styling, and the real criticism is that, even in Detroit's terms, it's not wonderful. One would think a car might be big and shiny *and* beautiful all at once.

Sporty *continental details are hard to adapt. Exposed spare blocks Nash trunk. Hard-to-wash wire wheels, used to cool brake drums on racing car, are simulated on heavy Cadillac convertible.*





Lowslung *car crowds passengers, is hard to enter. GM suggests swivel chairs on experimental Pontiac 4-man sedan. Buick station wagon has no third seat.*



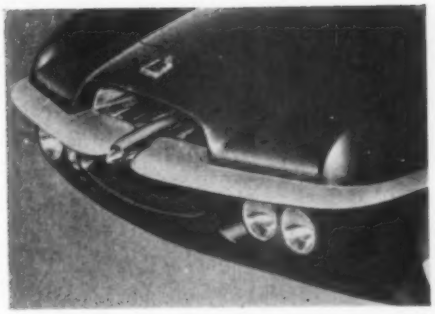
'46

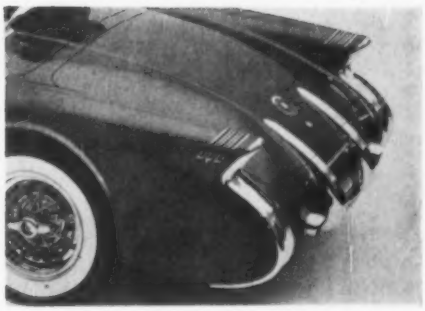
'51

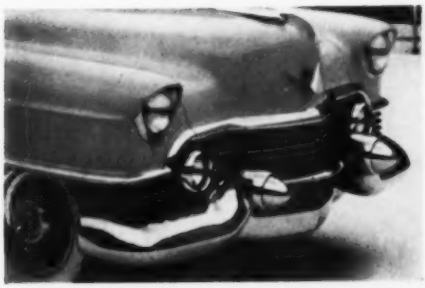
'54

Sleek *ram, Dodge radiator motif, illustrates design progress since 1946.*

'53

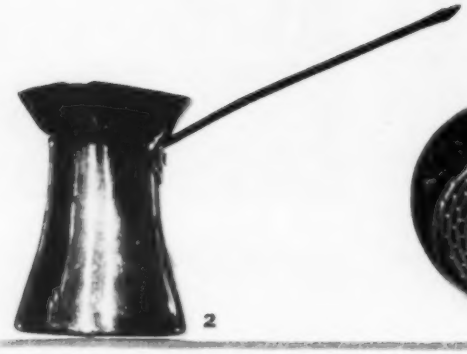






Powerful *bumpers also show progress. Dodge Firearrow and Packard Panther share new crusty look. GM tries gentlemen's approach on experimental Wildcat, sticks to "bombs" on real Cadillac.*

1



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1 *Italy: a heavy copper kettle hung over the fire by a white metal handle looped through solid brass hinges holds the ever-boiling* polenta *of the Po region.*

2 *Turkey: thick, sweet coffee is boiled in small tin-lined brass beakers.*

3 *Holland: scored bottom on a new heavy aluminum frying pan distributes heat and fat, prevents sticking.*

4 *France: the Normandie coffee pot is aluminum, with a wooden handle at right-angle to the spout.*

5 *Japan: iron pan is commonly used to cook* sukiyaki *on a brazier at the table. Notched legs fit into the stove, then keep the hot pan bottom from the table. Brass gears hold handles at any angle, upright or flat.*

6 *Spain:* paella valenciana, *a spicy rice, sausage and seafood dish, is cooked (sometimes in the ground) and served from shallow pans up to three feet across. Hammered bottom prevents sticking.*

7 *China: supported by ventilated iron ring, all-purpose cooker consists of iron bowl to be used alone for frying or, filled with water, with bamboo superstructure for steaming. Vegetables steam in latticed trays, separated by bamboo rings and covered.*

8 *Italy: perforated rack allows fish to be lifted unbroken out of a shiny brass-handled aluminum steamer.*

9 *Japan: copper kettle is allowed to gather a rich blue-green patina.*

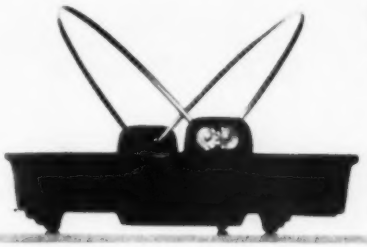
10 *France: white porcelain body and handle of this Limoges saucepan are united by a single tinned metal band held taut by one screw.*

11 *France: enameled in flame-orange and grey, the heavy-duty iron saucepan is levered by a short, manageable handle.*

Designs from abroad

Although cooking at the table and dining by the oven have only recently become stylish in this country, intimacy with food preparation has long been encouraged in traditions as diverse as the Mexican chili pot and the duck press at Maxim's. Some of the cooking utensils shown here are traditionally meant for the table; others could easily appear there.

4



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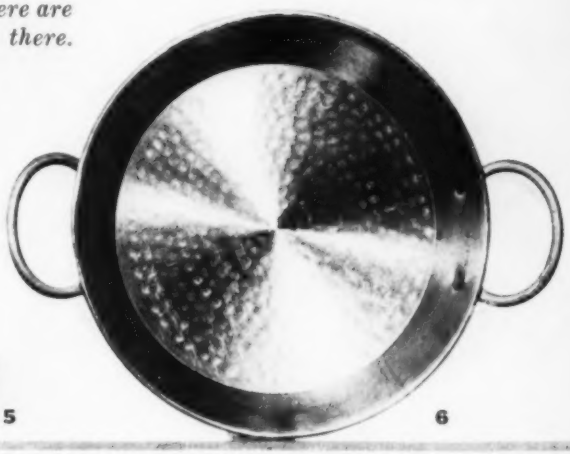

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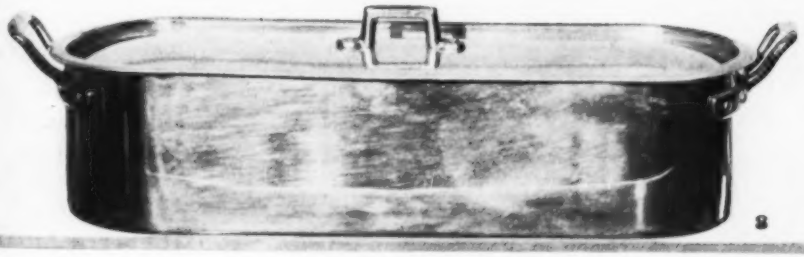

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Many of these can be found in New York:
1, 2, 4, 8, 11 Bazar Francais
3 The Edwin House
5 Katagiri & Company
6, 10 Bloomingdale's

10

11

shapes as identifiers

by Ladislav Sutnar

Five plain geometric shapes are used in standard psychological experiments because they are easy to recognize—the circle, the square, the star, the cross and parallel wavy lines. Silhouettes of planes help spotters to identify them at great distances. We recognize animals by their characteristic contours and remember trees by the outlines of their leaves. Because these examples indicate how people see and remember things, they contain suggestions for the designer of products and packages.——Ideally, a package should be recognizable the moment it is seen, especially when its job is to invite repeat purchases at the point of sale. It must mean something when flashed on the TV screen or reduced in size in an advertisement. That is why it is interesting to explore the design possibilities of clear, simple shapes, in two or three dimensions, as valuable devices which give character to products. Trademarks are just what their name implies—marks which identify the maker —because their silhouettes make a direct impression which is easy to recall. So do unusual, simple graphic shapes used to coordinate other visual elements on a package, which may be the name of the brand or of the product, letters, pictures or other symbols. Sometimes the entire exterior form of a package or product can be made an identifying feature, in which case design extends to the structure of the bottle, box, cake of soap and so on.

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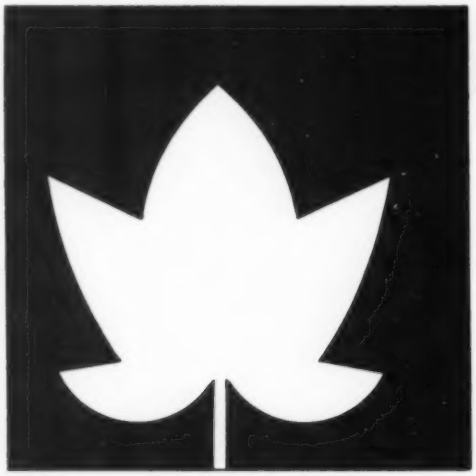

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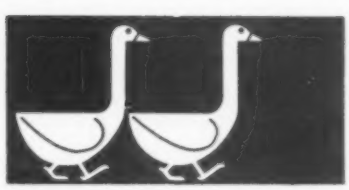

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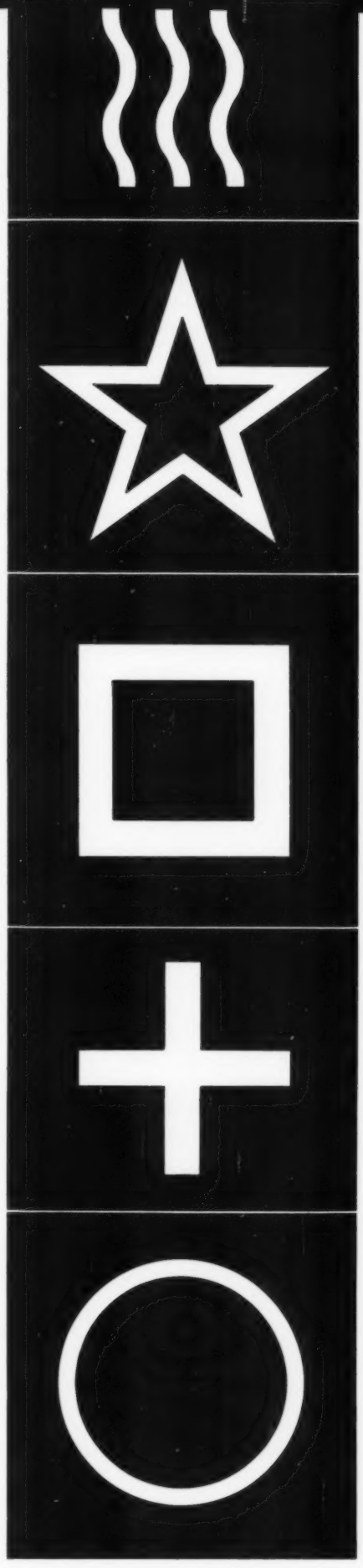

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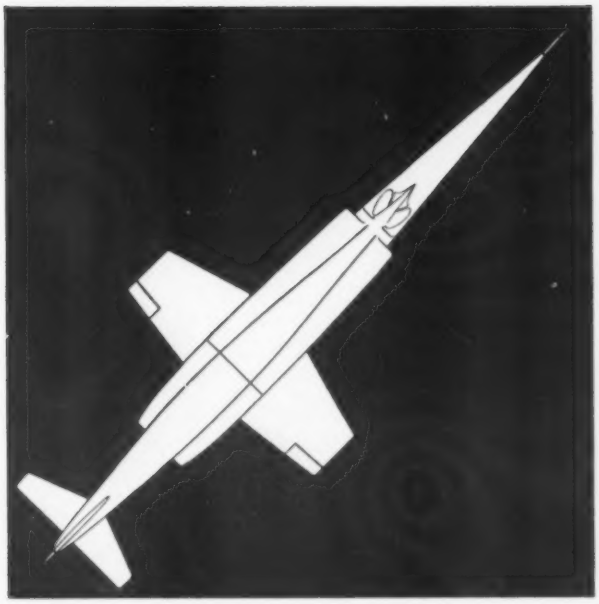

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14

shapes as identifiers in nature—(*opposite page*)—1/4—*drawings to help laymen in rapid identification of trees by the silhouettes of leaves and the forms of seeds: an average oak leaf, an acorn, a simplified maple leaf and a winged maple seed*—5/6—*graphically clear symbols of animals applied in pictograms: cattle and geese shown here designed by August Tschinkel*

geometric shapes easily recognized—(*left*)—7/11—*symbols used in parapsychological experiments* (*Duke University*)

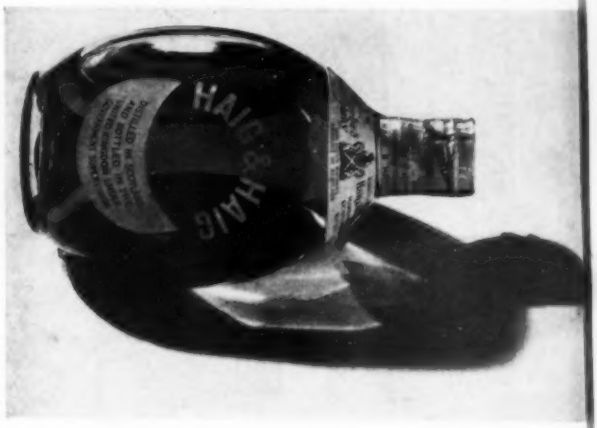
aircraft identified by silhouettes—(*top*)—12—'*Douglas X3*' *needle-like supersonic research aircraft*—13—*US Air Force 'Piasecki Transporter'*—14—*British 'Avro 698' delta-wing bomber*

Among liquids in glass containers, for instance, it is not hard to find examples of packages that are distinguished by their shapes, possibly because the material's pliability in manufacture invites adventuresome three dimensional treatments. Some bottles are outstanding. Wine drinkers know well the traditional fat-bellied fiasco which identifies Chianti better than any claret bottle. By association, straw-covered flasks in the United States have come to mean all kinds of imported or domestic Italian wines. In spite of the recent vogue for fancy decanters created by competition in the liquor industry, the simple Haig and Haig pinch bottle remains an outstanding and economical design well suited to its material — at once an effective symbol and a practical package ——

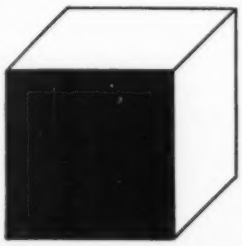
In marketing perfumes, the significance of package design is well recognized. An intriguing name and a symbolic bottle form are considered as vital as a perfect fragrance. This emphasis on the individualized container extends to beauty aids and toiletries as well. The square cut-glass bottle for Knize's Polo Ten cologne, the tapered plastic applicator for Revlon nail enamel, and the gooseneck glass bottle of Odol mouthwash are examples in which function and identifying form are harmoniously combined.—— The containers on these pages show a few of the many unexpected ways a package form can symbolize a product, and how this form, if it is promoted enough and seen on a market often enough, can above all become a product trademark.

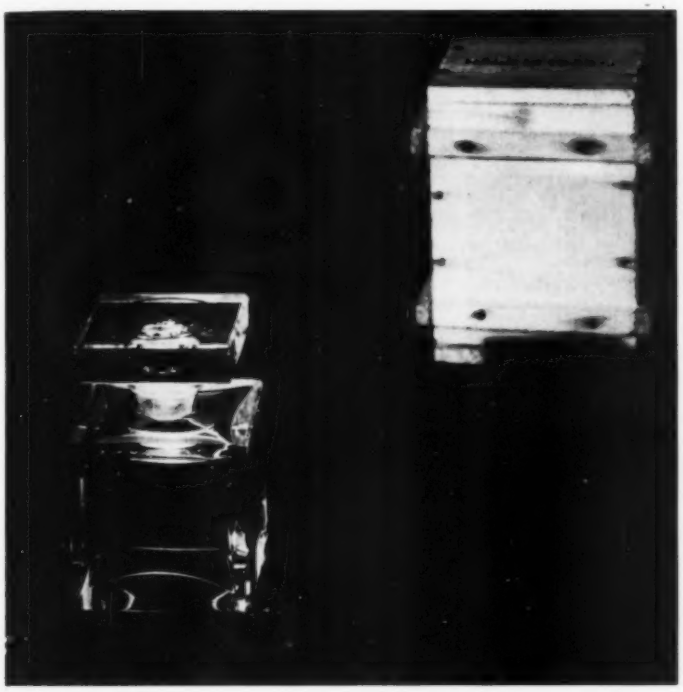
15

16/19



bottle identifies the beverage—15—straw-covered flask typical of Italian wine; here, a flat 'Bardolino' bottle—16/19—pinchbottle identifies 'Haig & Haig' whiskey





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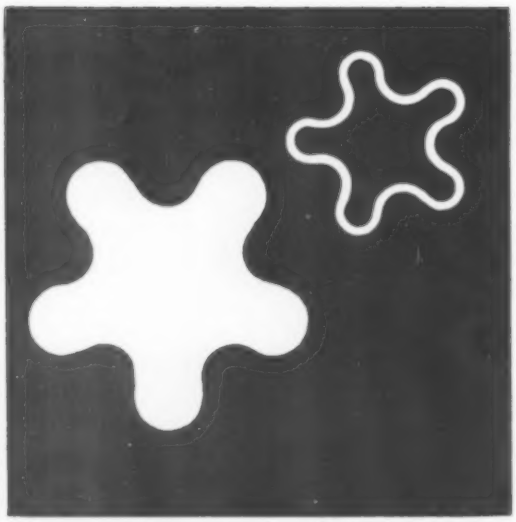
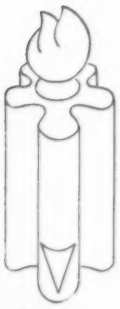
24

characteristic shape of a perfume or a cosmetic container helps quick recognition —(above)—20—a rounded bottle of Guerlain 'Shalimar' cologne—21/22—a square-ish cut crystal flacon and a wooden crate of Knize men's perfume 'Polo Ten', designed by architect Adolf Loos (Vienna, 1929)—(left)—23—the 'Odol' drop-by-drop gooseneck bottle and its characteristic logotype, both serving as trademarks of a mouthwash so widely used in Europe (ca 1890)—24—the 'Revlon' nail enamel container with a functional applicator, designed originally by Donald Deskey Associates (1950)

26





27

rounded forms composed of three or five connected circles—25—experimental models—26—star-like cross section of a five-winged perfume bottle—27— same container with a flame-like stopper to increase recognition; designs by Ladislav Sutnar (1943)

25

28/29

31

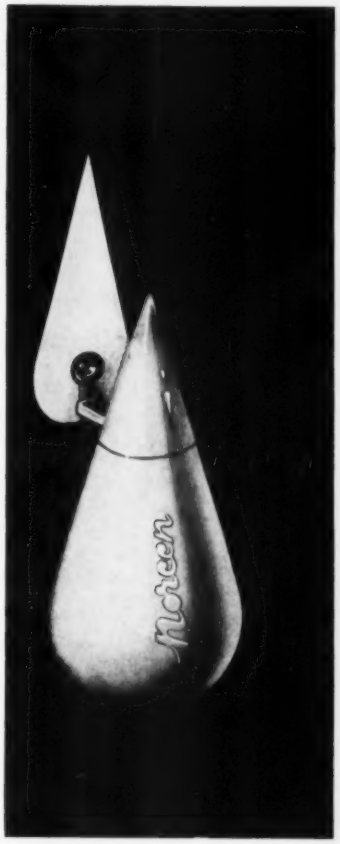
experiments with geometric shapes: flacon and decanter—28/29—Yardley's 'Flair' perfume bottle, a preliminary model and final working drawing by Reco Capey—30—finished 'Flair' container (Art and Industry, London, 1952)—31—simple distinctive 'Old Grand Dad' whiskey decanter (1953)

30

Designers working independently with simple geometric shapes sometimes reach similar results, but different proportions, and visual emphasis can give even related shapes a strongly individual character. Yardley's Flair perfume bottles and the White Mink group of toiletries are examples of this in a broad sense.——The distinctive teardrop shape of the Noreen shampoo trademark initiated a remarkably consistent presentation of a product. The teardrop shape was used on Noreen tags, leaflets and color selectors, and guided the experimental design of a plastic dispenser.——This way of using a visual theme is applicable not only to simple geometric shapes but also to fantastic ones. They might be used in forming a container which is an extension of a trademark, or in designing a container silhouette that interprets a brand name. With the traditional and new materials on hand today, in fact, there is almost no limit to the way identifying shapes can be exploited.

experiments with geometric shapes: toiletries—(below)—
32—*triangular 'White Mink' soap wrapped in transparent plastic film, in a black and white gift box* (1952)—**33/34**—*the teardrop shape of 'Noreen' creme shampoo trademark repeated in tags, a color selector and a plastic squeeze-bottle that may hang on the wall or stand on its own base* (1953)*; design by Herbert Bayer and Wayne Robb*

32



34

33

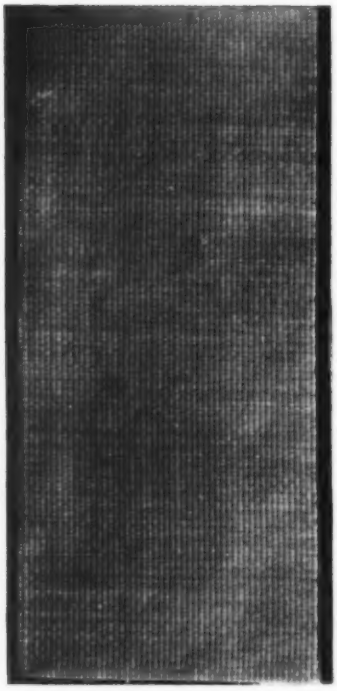
layout of this article designed by Ladislav Sutnar

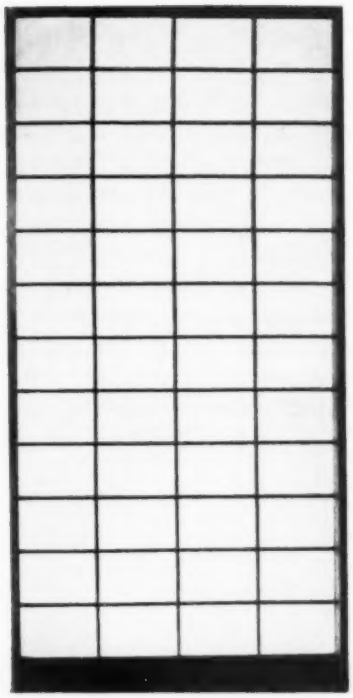
With nothing but wood paper straw and plaster

the Japanese have created homes and palaces of unmatched sophistication. Details of their traditional construction show how humble materials, sympathetically used, can produce objects of great refinement.

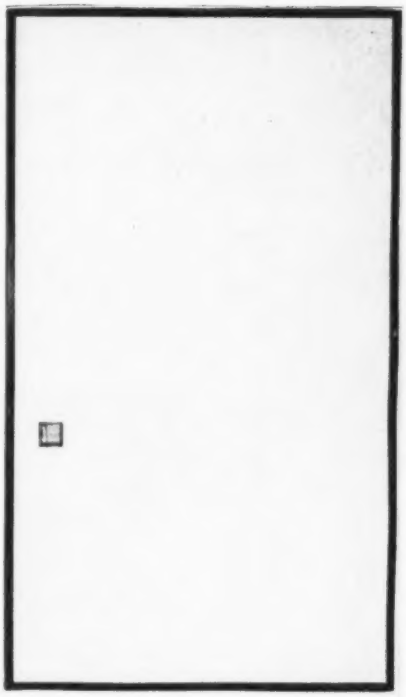
The large and handsome exhibition, "Japanese Architecture," recently prepared by the Museum of Modern Art's Department of Circulating Exhibitions, points out *why* the Japanese have a sensitivity to materials which is found in almost no other culture. The basic ideas of Japanese life come from two ancient religions: Shinto and Zen Buddhism. The first calls for a profound identification with nature, hence reverence for natural materials; the second demands a disciplined environment suited to the entire art of existence. The two philosophies have penetrated Japanese life for centuries, with the result that when a craftsman builds a bamboo fence or carves a wooden post he does it with a reverence for their innate qualities.

The exhibition, organized by William Alex and designed by Carlus Dyer, will travel under the auspices of the International Program made possible by a Rockefeller Brothers Fund grant. A book on "The Japanese House" by Arthur Drexler will appear next summer in connection with a full-scale Japanese house to be built for display in the Museum's sculpture garden.

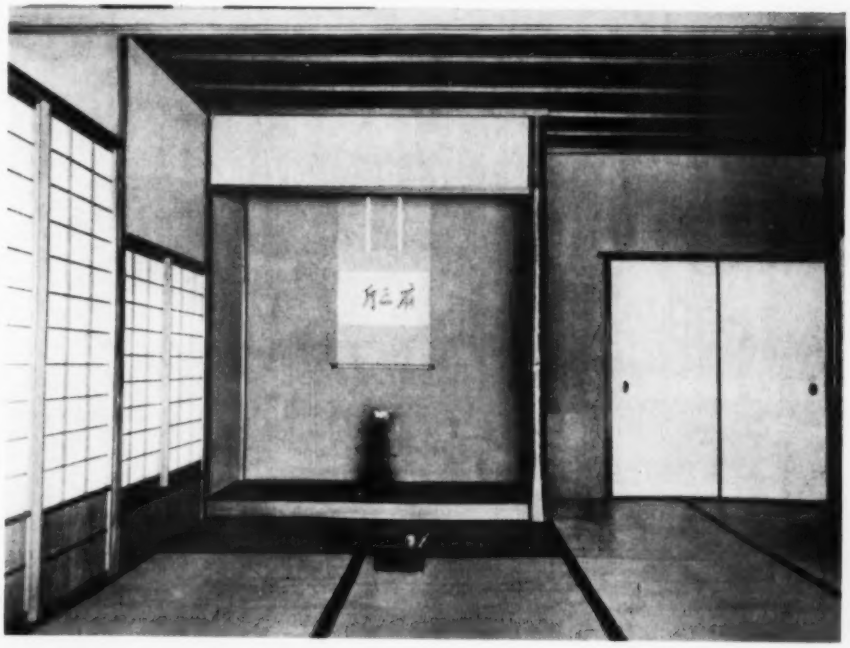




Three basic elements and a subtle sense of variation give the tradit

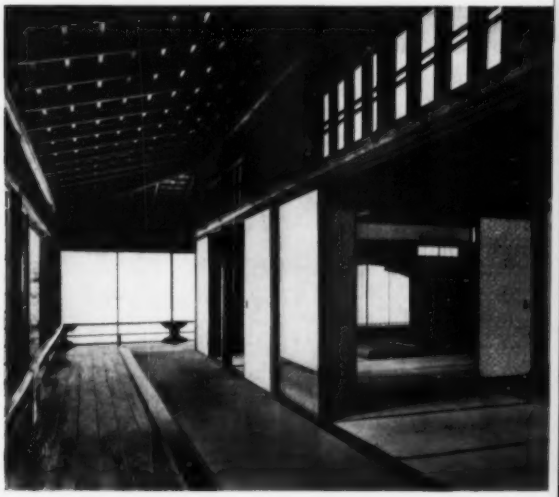


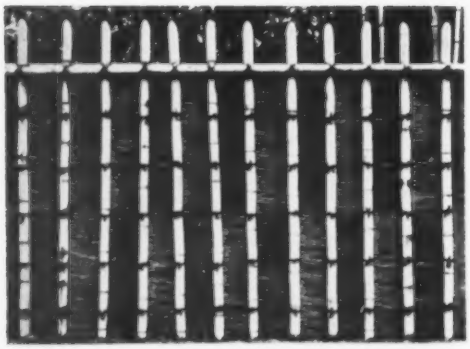
Floor mats, called tatami (far left) are 3′ x 6′ woven straw mats, the module of every room. Exterior screens, called shoji (center) are made of wood lath covered outside with translucent paper. Interior dividers, or fusuma (left) are sliding screens covered with paper on both sides. These materials, arranged on intersecting planes, make a harmonious space of the simplest room.

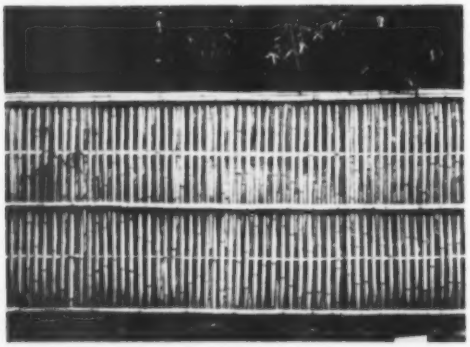


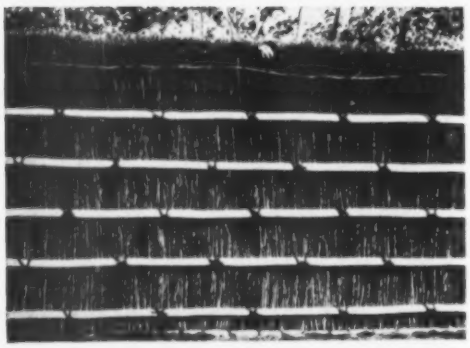
the traditional room its character:

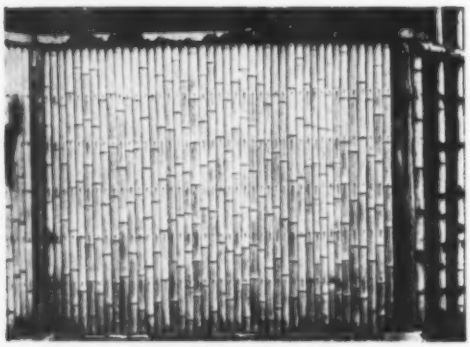
Even opulence is expressed with this vocabulary of scale and order. Elaborate murals and carved transoms in the Monoyama Castle (left) are held within the strict modular framework of mats, screens and posts. Note how small structural details like the nailheads are turned into decoration. In Katsura palace (below) richness is again achieved simply by playing traditional textures against patterned paper and highly polished wood.



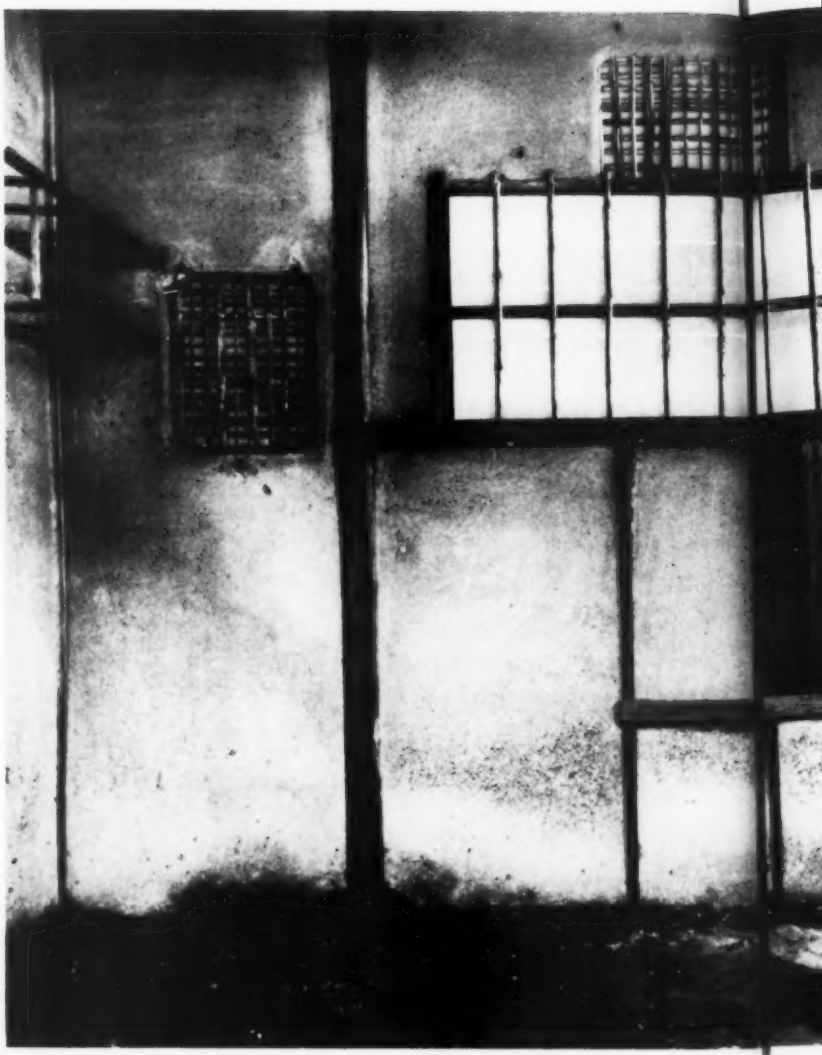








Sets of fences bounding Katsura palace show that an understanding of the brittleness of bamboo and the softness of rush in no way limited the inventiveness of the craftsman who twined and knotted them.



Materials, treated with precision and finesse, give a rare elegan to t

Plaster, often textured with straw, covers wood lath on the walls of old tea houses. Though symbolically rustic, the tea houses show a high order of sophistication in the way the posts are hewn and the walls are proportioned into openings for air, light and people to enter.

legan to temples, pavilions or fences.

Large wood roofs developed as an expression of the traditional post and beam construction. In ancient Buddhist temples (left) a complex system of rafters and brackets was needed to hold them up—to compensate for the fact that they were not based on the logical truss system of their Chinese prototypes. It is paradoxical to find such an elaborate effort to maintain an illogical convention in the Buddhist temples, while the Shinto shrine of Ise (above) shows an absolute respect for the organic use of materials. Though it is one of the earliest examples, it is perhaps the ultimate expression of the beauty which comes from total eliminations of the insignificant.

DESIGN REVIEW: *"Good Design"*

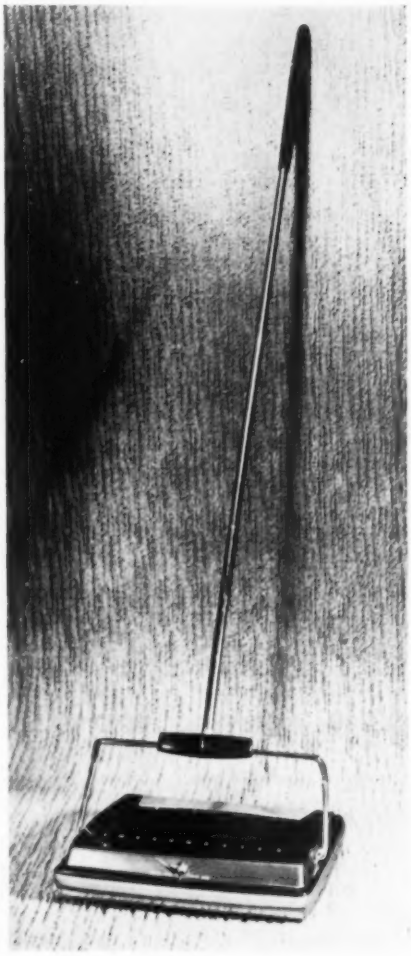
Herewith a sampling of objects chosen during 1953 to wear the Good Design label of New York's Museum of Modern Art and Chicago's Merchandise Mart. As usual, most were home furnishings, accessories, and colorful gadgets. Among major companies represented were Hoover, Norge, Corning Glass, RCA Victor, B. F. Goodrich.

In June, Good Design will forego new choices to pick its favorites from its first five years, point out some best sellers, and read the future with student exhibits.

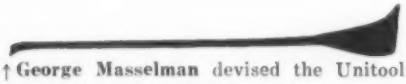
←**Betty Cooke's** black iron andirons are hinged at the back so that the brass pins which support the front can fan out to make a grill of any desired width across the fireplace opening. System can support one bar or five. 903 Tyson Street, Baltimore, Maryland.

↑**Gross and Esther Wood** give stainless steel a satin finish and use it as a decorative material in plain, elegantly conceived bowls and ashtrays. The thinness of the sheet material is emphasized by the wide flare, the rim sharply terminated without a turn-over, and by the softness of the line where the sides turn into the base. Though the material is industrial, the effect is of hand work. The Woods were also represented in the Good Design show with bowls and trays in pewter, an expanded metal wastebasket, and black iron candleholders. Gross Wood & Company, 230 Natoma Street, San Francisco.

↓**George Kosmak's** prefabricated fireplace is described as "portable wood-burning stove" for building codes. Welded steel walls are Fiberglas insulated, finished with black graphite; hearth is ceramic. Museum overlooked less high-style round and squarish models on stubby Japanese legs. 45 Castle Street, San Francisco.

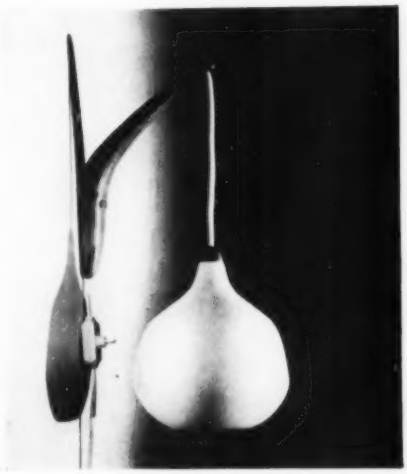


↑**Bissell's** new light-weight carpet sweeper, designed by Harley Earl, uses a full-width brush in a scaled-down case to sweep same wide swathe as standard models, get under furniture and up against baseboards better. It stands flat against the wall for compact storage. The metal body comes with four metallic finishes. Plastic grip on chrome-plated handle is said to recall "feel of an expensive golf club." Price, about $12.75.

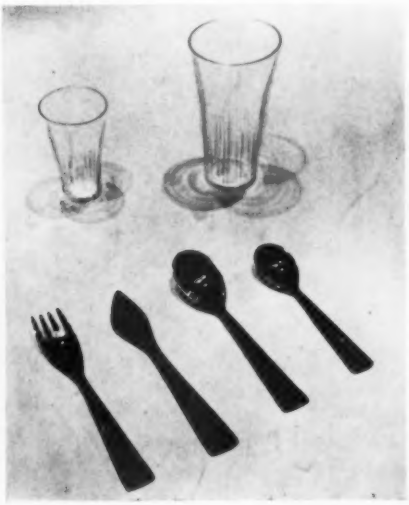


↑**George Masselman** devised the Unitool to combine poker, shovel, and tongs in one all-purpose tool. It comes with square handle of brass or aluminum, but Museum chose less expensive version, hand-forged from one piece of black-painted iron. Masselman Designs, West Redding, Conn.

↑ **German** cooking implements of stainless steel, each formed in one piece, were designed before war. 20″ rack of eleven pieces retails at $30. Imported by Joseph Franken, 200 East 63rd Street, New York. ↓ **Osten Kristiansson** wall lamp has a globule of milk glass suspended by its cord from a twist of oak that screws to the wall. About $36 at George Tanier, 521 Madison Avenue, New York, N. Y.



↓ **Gio Ponti's** stately stainless steel flatware suggests blanks from which conventional pieces might be formed. High gloss contrasts with satin finish common on Scandinavian lines. Imported from Italy by Fraser's, 2409 Telegraph, Berkeley, at George Jensen and Bonniers in New York. Swedish Artist Group tumblers from S. Christian of Copenhagen, San Francisco.

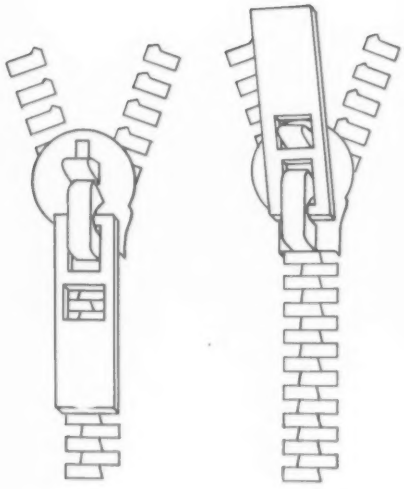


↑ **Ekco** has extended its line of copper-bottom stainless steel cooking utensils to include an 8-cup drip coffee maker, designed by Raymond Loewy. Although many companies are now styling coffee makers with neo-classic lines to suit them for the dining table, Ekco continues to rely on the sturdy kitchen construction and extravagantly practical materials that have made similar comparatively expensive houseware popular in the past. About $12.50.

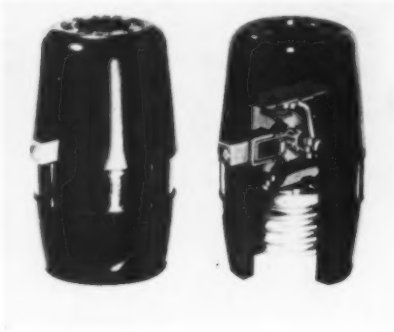
↑ **Sidney R. Bell and Irving J. Moritt** designed Jet Brush for growing market for economy dishwashers. Detergent-holding body is high-impact styrene; brush end incorporates a plate scraper. Made by I. J. Moritt Products Company, 405 Lexington Avenue, New York. Retail, about $2.98.

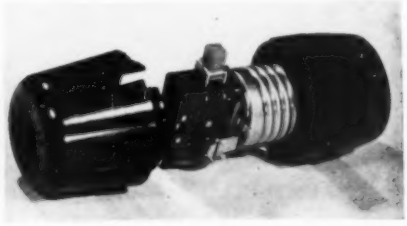
↑ **Logistics Research, Inc.** has unveiled the ALWAC, a new all-purpose electronic digital computer whose low cost ($48,000) may bring it into commercial use. The rotating magnetic memory drum stores 2048 words; Logistics president Glen E. Hagen holds one of the heads which both "write" and "read."

↑ **Peerless Photo Products, Inc.**'s new Dri-Stat flat-bed printer can make quick photocopy negatives of papers or bulkier material. Separate, equally neat processor makes positives. Frank Arnold, inventor.



↑ Three major companies have a new clog-proof zipper, shown here in the **Talon** version. To release snagged material, the pull is flipped over (right) and pressed until it releases latch, allowing teeth to open.

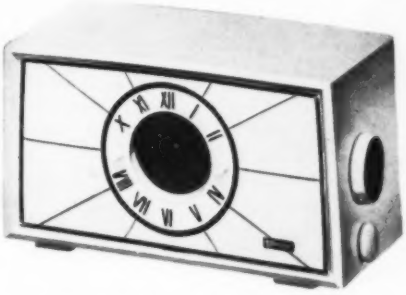




←↑ **McGill Mfg. Co.** heavy-duty socket has new push-button internal mechanism; protective brown molded phenolic casing by Morton Goldsholl unscrews at the middle.

→ **Simmons Machine Tool Corp.** and **Aluminum Co. of America** engineers evolved a lightweight (27 lbs.) litter-cot from a New York Civil Defense idea. Operated by push-button at "knee," legs fold under for carrying or lock extended for stacking cots.

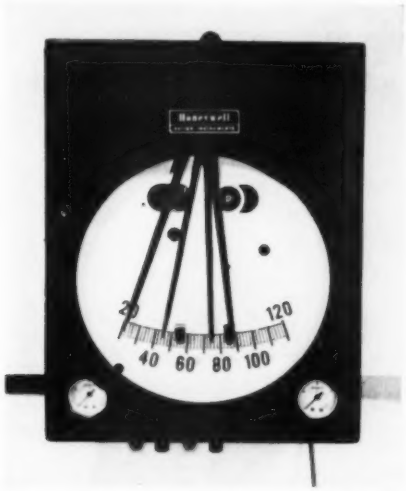
↑ **International Business Machines'** newest electric typewriter is smoothly encased in blues, greens or tans by Eliot Noyes.



↑ **Webcor** clock radio can also operate a tape recorder, phonograph, or coffee pot, is crisply plastic-finished, even the back. Reinecke and Associates, designers.

↑ **Borg-Erickson Corp.'s** slim gold-trimmed scale designed by Raymond Loewy Associates has pastel plastic platform.

↑ **Zenith's** new Trans-Oceanic has simplified band selection. R. D. Budlong, designer.

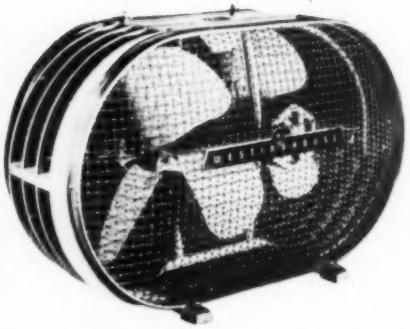


↑ **Minneapolis-Honeywell's** new dual indicating thermometer-controller can be used with practically any two thermal systems.

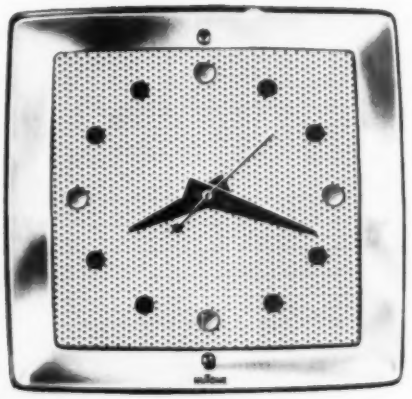
↑ **I.D.E.A., Inc.,** presents slicked-up Hi-Fi units displayed in neat glass-topped perforated aluminum housing. Painter, Teague & Petertil, with I.D.E.A. engineers.

↑ **Philco's** ambidextrous 1149 refrigerator will open either right or left, (but never both directions at once, as the playful double exposure below suggests) on an alternating hinge which is released on either side by V-shaped double handle. It will simplify kitchen planning and dealers' inventories of left-hand doors.

↑ **Thermidor Corporation**, pioneer in built-in stoves, has now branched out with a line of conventional console models.



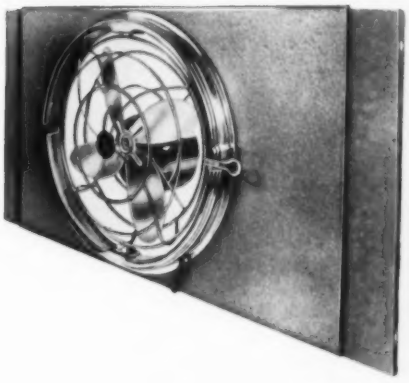
↑ **Westinghouse** offers a window fan whose unique shape derives from twin blades. "Air injector rings" increase circulation, make fan easy to reverse or to carry.



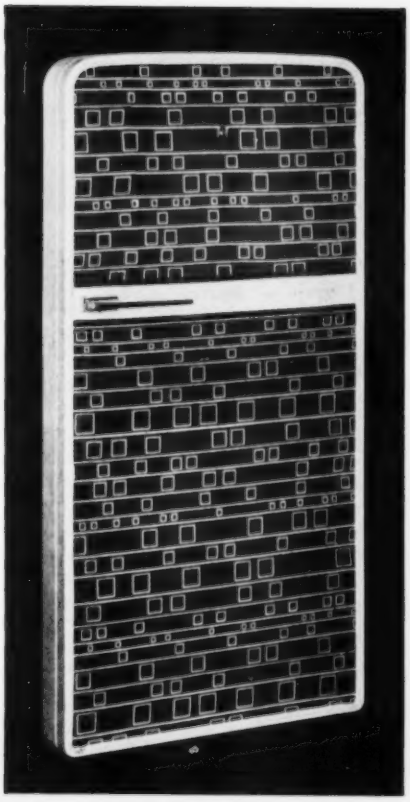
↑ **NuTone's** door chime can be recessed so that grille is flush with wall. Painted, or combined with clock, grilles can be installed in several parts of the house.

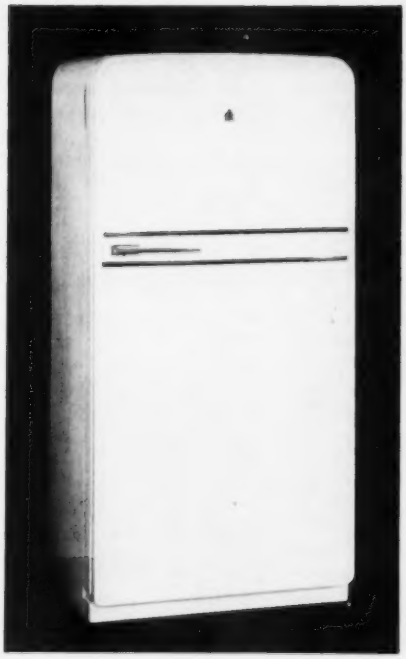
↑ **International Harvester's** air conditioner can be fabric-covered like its refrigerator or left plain if you prefer.

↓ **Chrom-ever's** new "Reversible 1000" fits all windows by means of sliding extensions. Cast aluminum body is supported by a steel frame, enamel-finished.



↓ **A. C. Gilbert's** A-3000 Windstreamer (18") oscillates in any selected arc. A honeycomb grille directs churning air into a high-speed jet stream.





↑ **International Harvester,** utilizing the box girder construction principle, achieved a crisp, bulgeless refrigerator door over which homemaker can stretch fabric panels. Dave Chapman, design consultant.

technics

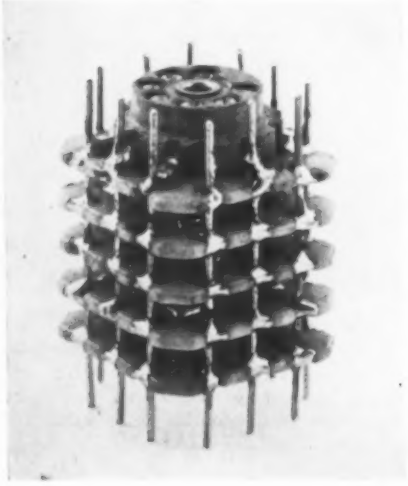
A catalog of new products, materials, processes and finishes

Project tinkertoy

Although electronics is one of the principal wonders of modern technology, the physical forms of electronic assemblies have remained primitive. The sight of the underside of a radio chassis is downright frightening to any layman, and even the technician who must work with it, however accustomed he may be to its physical appearance, suffers from its complexity and confusion. The fact of the matter is, of course, that although the behavior of modern electronic devices is the product of advanced scientific thinking, the products themselves have always been assembled in a crude way not far removed from the "breadboard" set-up of the experimenter. The individual components, resistors, capacitors, tubes and sockets are placed wherever they happen to fit, and the electrical connections are made with solder or solder-plus-wire in any expedient way. Because this haphazard method of assembly has never been particularly adaptable to true mass production, the assembly of most electronic devices, even now, depends on the hand work of individual workers with soldering irons.

An ingenious new system of assembly —the first major step toward making the assembly of electronic devices as modern as their design—has emerged from "Project Tinkertoy," which was a research project sponsored by the Navy Bureau of Aeronautics and conducted by the National Bureau of Standards. The objective was to find a way to assemble electronic devices that would take advantage of such developments as printed circuitry, that would permit mechanized manufacture and assembly with a minimum of hand labor, and would at the same time allow flexibility and interchangeability of parts.

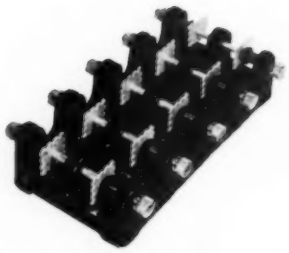
Complete Tinkertoy module of five wafers with tube socket on top.



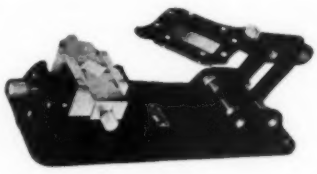
The solution is a modular one, based on the use of a standardized ceramic wafer which measures ⅞" square and has twelve notches on its perimeter. Resistors, capacitors, tube sockets and conductors are located on the faces of the wafers, which are then stacked into assembled modules. A typical module is a stack of five wafers with a miniature tube mounted on top. The wafers are held apart by conductors inserted into the notches of each, and all electrical connections are made to these conductors. A five-wafer module measures only ⅞" x ⅞" x 1⅛" and weighs about six-tenths of an ounce. It may carry as many as 17 components and up to 24 external connections. More important than any of the advantages of strength, compactness and lightness, however, is the fact that the modules are suited to automatic machine production.

The research project also developed mastermind machines which take orders from punched cards describing the desired module, print the appropriate circuits on the individual wafers, assemble resistors, capacitors, tube sockets and other components to the appropriate wafers, put the wafers into complete modules and assemble groups of modules onto plates. The plates are then ready for insertion into devices which are otherwise built up by conventional techniques. Repairs in completed products are taken care of by replacing whole modules (just as tubes are now replaced) rather than by attempting to isolate an individual defective component.

The advantages of the system for producing units in an organized and efficient way are enormous. When combined with other recent electronic developments that favor small size and comparative sim-

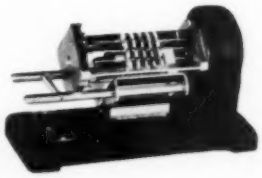


Fixture for holding wafers while notches are painted with silver paint.



Printer for silk-screening conductor patterns, resistors and capacitors onto face of wafer.

Press for assembling tube sockets on wafer (above) and (below) assembly fixture for holding wafers while wires are soldered into notches to complete module.



plicity (such as the substitution of the transistor for the vacuum tube) it will open the ways for electronic equipment to become much less expensive, bulky and complex.

To help the design of circuits and assemblies for "Tinkertoy" production, a complete kit of experimental tools and raw materials has been developed. The kit (which costs over $2000) includes some sixty pieces of specialized equipment, including circuit printers, firing furnace, oven, and a large assortment of standard wafers, risers, and chemicals. The modules made with these tools on a laboratory basis can be reproduced perfectly by the large mastermind machines designed for regular production. The kit is produced by the Communications Measurements Laboratory, Inc., 350 Leland Avenue, Plainfield, N. J.

Inexhaustible battery

A battery capable of supplying an electric current continuously for an estimated 20,000 years has been made possible by the discovery of converting radioactive energy directly into electric energy. This is the first new method of generating current discovered in fifty years, and adds a fifth means of producing electricity to the four already known—the generator, the electrolytic cell, the thermocouple and the Kelvin-Null method of contact-potential measurement.

Preliminary work on the battery was done by the inventor—Philip E. Ohmart, President of the Ohmart Corporation of Cincinnati — at Mound Laboratory, an Atomic Commission facility operated by Monsanto Chemical Company. The original battery used electrodes of lead and gold with an electrolyte of gas which had been forcibly ionized by exposure to nuclear radiation. A series of experiments were

Inventor Philip Ohmart holding an "atomic battery" having an estimated life of 20,000 *years.*

conducted to locate other materials for the electrodes, particularly to replace the gold positive electrode. "Aquadag," a dispersion of colloidal graphite in water made by the Acheson Colloids Company, was found to be suitable and is being used in the batteries in production at present.

The four types of atomic cells now being manufactured by Ohmart were designed for the measurement instruments used in the investigation of radioactive isotopes. Their currents are small in all cases, but it is within the realm of possibility to build an atomic battery which will drive a motor or any other electric device. Should a battery with a 20,000 year life be perfected, its effect in freeing electric devices from plugs, cords and power lines is not difficult to imagine.

Densified wood

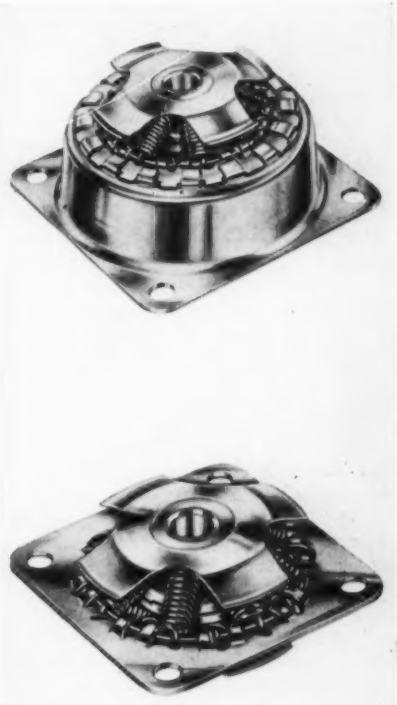
Parkwood Laminates Inc. is producing a densified wood called Hi-Den, for many products requiring the qualities of laminated woods plus the durability of the densified material.

The product is based on techniques of impregnating woods with Bakelite resins introduced as far back as 1943 under the name of Compreg. Hi-Den No. 112, which is a crossbanded veneer construction having uniform strength in all directions, and Parkwood 8000, which is a paper base laminate, have been successfully used in combination to make dies and forming tools, including templates, drill jigs, etc. Hi-Den can be machined with woodworking tools having high-speed cutters and blades and can be sanded to exact dimensions, and a surface polish can be produced by buffing. The maximum thickness offered ready-laminated is 2", but greater thicknesses can be built up by cementing several layers together with resorcinol-type adhesives.

Typical applications (other than molds, dies, and other production tools) include knife and tool handles, door handles, fishing rod parts, and even musical instruments. The tone quality of a Hi-Den clarinet is said to have been comparable to one made of solid wood and, of course, much more durable. Detailed information can be obtained from Parkwood Laminates, Inc., 24 Water Street, Wakefield, Mass.

Clear plastic

Homalite CR-39 is a clear thermosetting plastic sheet material of light weight and exceptional mechanical and optical properties. First of all it has excellent shock resistance (many times that of plate glass), and scratch resistance 30 times that of cast methacrylate. It can be readily cut, drilled and machined and has the special qualities of light-piping and edge-lighting. Homalite CR-39 is considered especially suitable for use in transparent protective guards for power tools, for cab enclosures, instrument windows, and the like. It is made in sheet thicknesses from 1/16" to ½" and in sizes up to 48" x 60". Detailed information is contained in a ten page booklet available from the manufacturer, The Homalite Corporation, 11-13 Brookside Drive, Wilmington, Delaware.



Top and bottom views of Equiflex vibration isolator. Springs are used in place of rubber, resulting in an all metal device.

All-metal vibration isolators

The Ucinite Division of the United Carr Fastener Corporation is producing a vibration isolator of all-metal construction. While similar devices have always used rubber or neoprene as the live element, the substitution of a group of springs in this device solves all problems of permanent drift or set, sensitivity to temperature and to extreme G strains.

The new mounts will sustain shocks up to 15 Gs without damage and will hold down equipment at strains up to 30 Gs. The units, known as Equiflex vibration isolators, are available in three sizes, for light loads (such as instruments), medium loads (such as cabinets of electronic equipment), and heavy loads (such as gasoline-driven compressors, etc.). Each unit is stamped with its load rating in pounds.

The active core of the unit consists of a core held by two opposed cones of coil springs plus an internal compression spring that acts as a damper on the movement of the core. The particular advantage of this unit is that its action remains constant under a given load regardless of the direction of thrust or the position of the mount.

Vacuum coated plastics

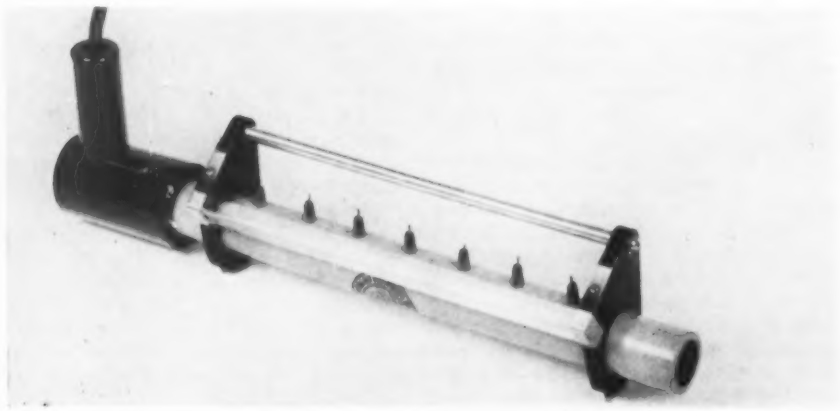
Coating Products of 136 West 21st Street, New York 11, is marketing a wide variety of laminated and coated sheet plastic products whose packaging, display and product uses have certainly not been exhausted. The company has facilities for printing on cellulose acetate (for use in packaging, etc.), for coating cellulose acetate in color, either transparent or opaque, and for vacuum coating either acetate or polystyrene plastics in metal and metallic colors. Products made by the latter process, which are marketed under the trade name "Mirro-Brite," can also be embossed in any desired pattern. Some of these unusual products include plastic partially coated to give either a reflecting or a transparent surface according to the lighting (as in a one-way mirror), and adhesive-backed sheet material that is both printed and metalized.

Designers have already recognized these coated plastic products as an economical means of achieving some of the effects of metal. Embossed metalized plastic, for example, when mounted behind a sheet material, produces a glittering texture that is becoming increasingly popular in the design of toys, novelty boxes, juke boxes and even in details of radios and refrigerators. Possibilities for the mis-use of this material, indeed, seem to have been better explored than its many interesting and logical applications. There has been little attempt to make use of the one-way mirror type of coating, for example.

Full information and a collection of glittering samples are available from the manufacturer.

Static neutralizer

For the processing of paper, plastics, textiles and other sheet materials whose static charges present production problems, an electrical device known as the Herbert Oxy Cold Bar will neutralize static charges from high voltage electricity.



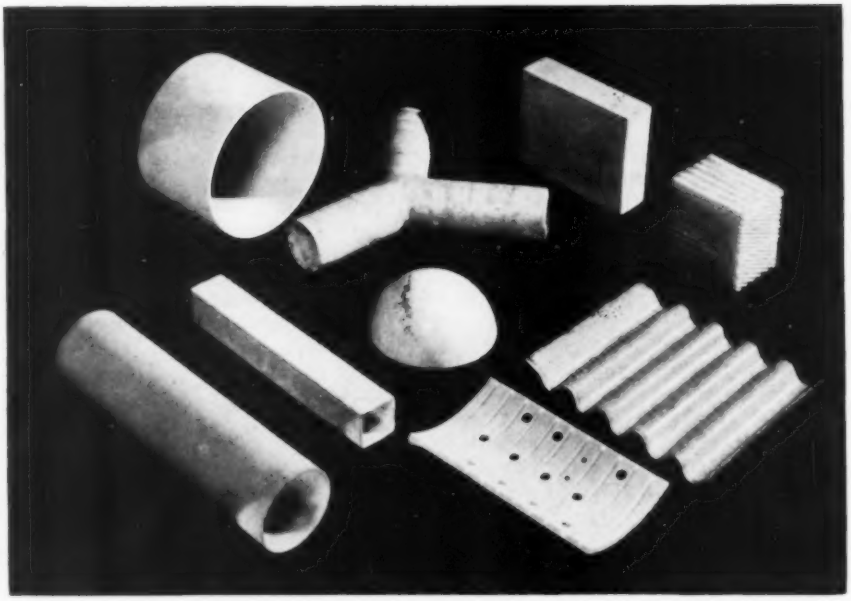
Oxy Cold Bar static eliminator. Static charges on sheet materials passing under the bar are neutralized.

The unit consists of a transformer which supplies high voltage current to a number of flexible emitter points distributed along a plastic tube of any desired length. By causing ionization of the air between the emitter points and the material surface, static charges are drained off through the metal parts of the machinery or through an aluminum ground rod provided as part of the unit.

The design of the unit is such that no shock or sparking can occur. Units are available in any length from 6" to 100". The unit is built from laminated plastics made by the Synthane Corp., Oaks, Pa., and is manufactured by Herbert Products Inc., Woodhaven, N. Y.

Bonding resin

A new bondng resin, Dow Corning 2106, with some interesting possibilities for use in low pressure silicone-glass laminates has been introduced by the Dow-Corning Corporation.



A variety of Silicone-glass laminate products made with Dow Corning 2106 bonding resin.

Typical ⅛" samples display strengths up to 50,000 psi at room temperature even before curing. High temperature strength is obtained with comparatively short cures. A strength of 10,000 psi at 500° F. is obtained after only 6 hours, which indicates that in many applications these laminates may be cured in service. Laminates using 2106 resin are highly water repellent and resistant to many common inorganic chemicals. Their heat resistance and dielectric properties contribute to their insulating value. Up the present time most samples have to be laminated at 30 psi or less, but there are indications that high pressure laminates would also be satisfactory. The properties of the new resin suggest that it will be particularly useful in lightweight parts that must show high strength at high temperatures. Full information is available from the Dow Corning Corp., Midland, Mich.

Textured siding

Plywood for exterior and interior siding is now produced in grooved panels which give the general effect of tongue-and-groove siding at considerably lower cost. The product, "Texture One-Eleven," is made with waterproof glues of Douglas Fir Plywood in ⅜" panels which are 16" and 32" wide, 8' and 10' long. (Shorter lengths will also be available.) Its surface, which has a rough natural texture with some small knots, has been scored at 2" and 4" intervals. These grooves contribute a strong regular texture which tends

to conceal both surface defects and the joints between panels (since the joints become simply more grooves).

On a recent remodeling job, it was estimated that the cost of Texture One-Eleven siding ran about 4 cents a square foot, compared to as much as 20 cents a square foot for regular tongue-and-groove siding. The somewhat rough texture of the surface will take stains, particularly in darker colors, very well.

The application of product of this kind poses some valid esthetic questions. Is this material intended to be used simply to imitate tongue-and-groove siding? If so, many designers may class it with metal printed to look like wood or straw, paper painted to look like marble, and other rather unconvincing imitations which have no satisfying character of their own. Possibly there are better ways to use it which will make the most of the texture's positive qualities—for here is a perfectly legitimate way of overcoming some of the problems of using ordinary plywood siding. The imperfect natural texture of fir is dominated by the stronger groove texture (a technique that was successfully used in Weldtex), and the panel joints, alway a visual problem in plywood siding, are minimized. If designers and architects concentrate on finding ways to use it with discretion and logic, they may have a material with a usefulness far beyond that of being a curtain wall for ranch houses.

Rusty metal primer

Corroded surfaces which cannot be completely freed of rust can now be repainted, with the help of a resin-based protective coating developed by the Surface Engineering Company. In cases where sandblasting might be dangerous because of spark hazards or where the danger of contamination of nearby equipment might arise, the new prime coat may be applied immediately after removal of loose rust and scale. Two coats of anti-corrosion paint are applied over the primer. The manufacturer reports that after 18 months of service, no visible breakdown of the paint skin is observed. (The rusty metal primer is not recommended for use on new or bright metals.) Details about the process, known as Perma-Skin Anti-Corrosion Coating with Rusty Metal Primer, may be obtained from the Surface Engineering Company, Inc., 1335 Barwise Ave., Wichita 1, Kansas.

New glue

Presto-Set the first new adhesive offered by U. S. Plywood since the introduction of Weldwood glue in 1941, is a polyvinyl (white) liquid adhesive which comes mixed and ready for use. It can be used to join any combination of porous materials including wood, cloth, leather, paper, etc., sets ready for machining in about 30 minutes, and develops full strength in 24 hours. Presto-Set can also be used for repairing porcelain or, when diluted with water, as a protective coating for paper (maps, pictures, etc.). It is colorless when dry and practically odorless. It will be packaged in small tubes, jars and drums. Prices begin at 25 cents for a 1½ oz. tube.

Latex adhesive

Placco 1000 is a new, super-strong adhesive for homeowners and builders to use in numerous jobs customarily calling for nails, screws or clamps. A quick-setting rubbery material, it is particularly handy for joining materials to non-porous surfaces such as kitchen and bathroom tile, as well as to metal, wood, wallboards and various flooring materials.

Its strength is suggested by the claim that surfaces, such as wood and masonry, will tear away before the Placco bond will fail. Laboratory measurements show that a two-inch square (four square inch) bond of Placco 1000 will withstand 300 lbs. pull at temperatures up to 300° F. It is waterproof, flexible, non-inflammable and non-toxic. Full information about the product can be obtained from the manufacturer, Pioneer Latex and Chemical Company, Middlesex, New Jersey.

Opalescent paint

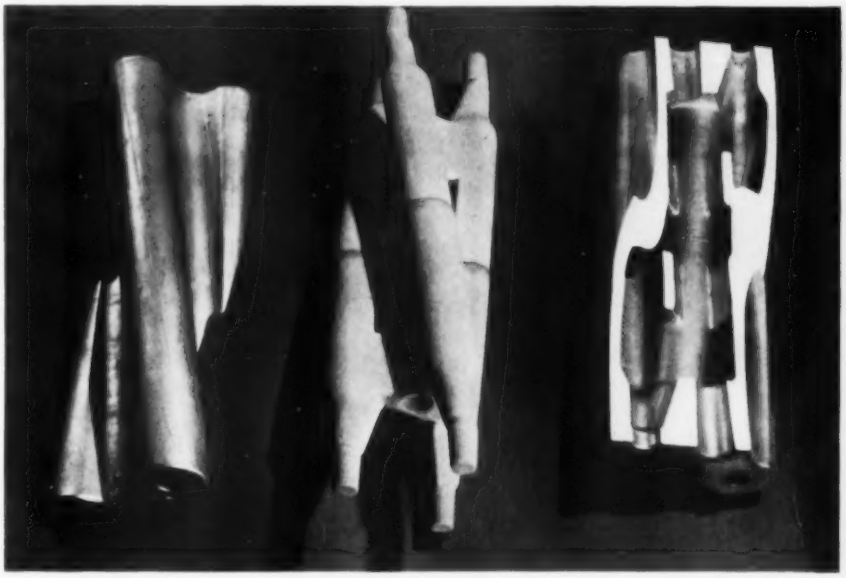
Opal-Glo paint, recently introduced by the Sherwin-Williams Company, incorporates many of the advantages of aluminum paint in a wall finish which comes in a variety of colors. In each of the seven soft colors which are available, aluminum particles give a metallic effect. There is high light reflectivity even in deeper colors, and unusual durability, cleaning properties and coverage are also expected. The paint base is of an enamel type requiring mineral spirits, not turpentine, as a thinner. Coverage is up to 1000 sq. ft. per gallon, which is more than twice that of standard paint, and 24 hour drying time is recommended before recoating. Variation in the textural appearance of the paint can be produced by using rollers, crushed paper, special brushes and similar techniques.

Opal-Glo was developed in cooperation with the Aluminum Company of America, with the idea of incorporating the characteristic of regular aluminum paint in finishes of more decorative appearance. A brochure including color chips of the new paint is available from The Sherwin-Williams Co., Cleveland 1, Ohio.

Precision molding cores

The Maco Corporation of Huntington, Indiana, has come up with a technique for making sand cores for aluminum casting that both cuts production costs and reduces time for machining. The cores are made with Bakelite phenolic resins which give the necessary permanence of form to the cores to prevent distortion when removed from the core box and assembled. The cores are baked in the core box in a very few minutes, thus eliminating the large number of accurate core dryers that would otherwise be needed, and are able to withstand the 1425° F. heat of the molten aluminum long enough to produce castings of excellent accuracy.

(Center) Sand core for aluminum casting made with Bakelite resin. (Left and right) The finished casting is shown cut open to reveal cleanness of casting interior.



Ardil protein textile fiber

Ardil, a new stable fiber produced from groundnut proteins is being produced in Scotland for textiles. The groundnut is imported to the United Kingdom for oil, a raw material in margarine production. The meal left after extraction of the oil is used to produce a fiber that has many of the properties of silk and wool combined with such advantages as moderate cost and resistance to fire, shrinkage, and moths. The fiber may be color pigmented, is processed by conventional textile techniques, and is recommended for use in blended fabrics. Blending with cotton or wool will lower the cost of the fabric without impairing its quality, and blending with synthetic fibers will not only lower cost but will also impart some of the qualities, such as softness, warmth and water absorbency, that synthetics tend to lack. As high a proportion as 80% Ardil to 20% nylon will produce excellent results.

Detailed technical information is available from the Imperial Chemical Industries, Ltd., Nobel Division, "Ardil" Fibre Department, Dumfries, Scotland.

Fiber glass molding

Experiments sponsored by the Quartermaster Department of the Army have led to the development of a method for making molded shells on a preform of glass fibers combined with cellulose fiber. The resulting material, called "Aqua-glas," is being used in the manufacture of trunk lockers which are less expensive than, and superior to, the conventional lockers of plywood construction.

A preform is made from a slurry of glass fibers and cellulose. A proportion of glass as low as 10% results in a large gain in strength and produces a preform that is self-supporting. The preform is then placed in a press and impregnated with a Laminac resin. No finishing operations are required and it is possible to obtain radii as small as ¼" and excellent dimensional tolerances. By dyeing the fibers of the preform it is practically possible to eliminate the fibrous pattern from the finished molding. The Aqua-glas process is being used at present to produce about 275 lockers per day with one set of screens and dies. The process appears to be suitable for the manufacture of large moldings for use in furniture and appliances and may, in the future, be adaptable to the manufacture of automobile body components.

Hot extrusion of steel

A plant just completed by the Allegheny Ludlum Steel corporation includes facilities for the hot extrusion of stainless steel and other special alloys. Allegheny Ludlum is a licensee of the French-patented process. Hot billets of stainless steel are extruded under a pressure of 1778 tons. The main use of the process is in making stainless steel seamless tubing, but it is also suitable for the production of small quantity orders of special alloys.

Spring action casters

A new catalog from the Faultless Caster Corporation lists a group of heavy-duty truck casters which incorporate a spring action serving the same purpose as the springing of an automobile's wheels. The weight of the truck rests on all four wheels as the wheels travel over uneven surfaces. Bouncing and the accompanying shock and noise are reduced. The group includes heavy and medium duty types in fixed and swivel versions. Wheel diameters range from six to twelve inches.

A new truck lock is also illustrated. This is an extending foot that can be mounted on the bottom of any rolling unit. When a pedal is released the foot is forced down against the floor to act as a positive brake.

Information on these and other caster products is available from the Faultless Caster Corp., Evansville 7, Indiana.

DISPLAY In launching this volume, INTERIORS has bound into one book some of the most ingenious and remarkable displays that have set new patterns in interior design thinking and techniques . . . in museums here and abroad . . . in shops from Minneapolis to Milan . . . in the Merchandise Mart in Chicago, the Triennale at Milan, the Festival of Britain . . . wherever creative designers have put prophetic ideas into three-dimensional designs planned to "show something." Edited by George Nelson, DISPLAY is a book that fairly crackles with fresh ideas. Its three main sections show the new systems, the outstanding displays and exhibitions created by more than 125 designers and architects of international note. It is a fertile source of new thinking . . . a basic book for every library of interior design—including yours.

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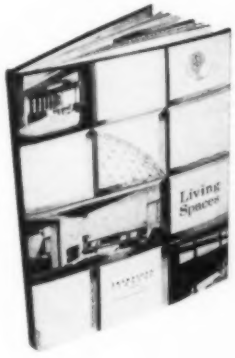

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Manufacturers' Literature

Alcoa Aluminum Corrugated Industrial Roofing and Siding. Aluminum Company of America, 804 Alcoa Bldg., Pittsburgh 19, Pa. 15 pp., ill. Aluminum industrial roofing and siding described in new booklet.

1954 Guide to Improved Packaging with Bakelite Plastics and Resins. Bakelite Co., Division of Union Carbide & Carbon Corp., 30 East 42nd St., New York 17, N. Y. 8 pp., ill. Detailed information on latest applications of molded and blown plastics, coatings, adhesives, film and rigid sheet metals for both packaging and display.

Balsa Wood. International Balsa Corp., 96-100 Boyd Ave., Jersey City, N. J. 19 pp. Factual report on growth, production, processing and uses of balsa wood.

CDF. Continental-Diamond Fibre Co., Newark, Delaware. 12 pp., ill. Technical data on Diamond vulcanized fibre and vulcoid, celoron molded industrial products, CDF spiral tubing, micabond, teflon & insulating tapes.

Firestone Exon Vinyl Resins. Chemical Sales Div., Firestone Plastics Co., Div. of the Firestone Tire & Rubber Co., Pottstown, Pa. 20 pp. Brochure outlining technical data on various resins.

Masonite Presdwood. Home Service Bureau, Masonite Corp., 111 West Washington St., Chicago, Ill. 31 pp., ill. This book is a guide for the selection, application & finishing of Masonite Presdwood Products.

Reynocell Panels. Reynolds Metals Company, Louisville, Kentucky. 18 pp., ill. Brochure covering sizes, properties, and other technical data.

Reynolds Metals Technical Advisor, No. 21 & 24. Reynolds Metals Co., Louisville, Ky. 4 pp., ill. No. 21 describes structural design with aluminum in mind; No. 24 describes aluminum tanks and pressure vessels.

Rigid-tex Metals. Rigidized Metals Corp., 658 Ohio St., Buffalo 3, N. Y. 15 pp., ill. Describes advantages and applications of Rigid-tex metal.

Sherwin-Williams Opal-Glo. Aluminum Company of America, 721 Alcoa Bldg., Pittsburgh, Pa., 4 pp., ill. Describes opalescent finish paint developed for professional use.

Stemco Type A Bimetal Disc Thermostats. Stevens Mfg., Inc., Mansfield, Ohio, ill. Bulletin suggests applications and describes operating principle. Also gives performance data, dimensions, construction details, ratings, etc.

Tin. The Malayan Tin Bureau, 1028 Connecticut Ave., NW, Washington 6, D. C. 10 pp. Provides information about tin production and marketing developments.

The Weldwood Catalog. United States Plywood Corporation, Executive Offices: Weldwood Bldg., 55 West 44th St., New York 36, N. Y. 48 pp., ill. Gives descriptions, sizes and approximate retail prices for every Weldwood product and suggests applications for the many products listed.

Window Glazing With Plexiglas. Rohm & Haas Co., Washington Sq., Philadelphia 5, Pa. 15 pp., ill. Booklet on how Plexiglas solves many window glazing problems.

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Calendar (*Continued from Page* 14)

Fourth I.D.I. professional awards, closing date for entries April 15. Open to all U. S. designers except I.D.I. officers. Any mass-produced product distributed 1953-54 is eligible. The award may go only to a specific designer or team of designers. Submit unmounted 8x10 photos with written description of problems and background of product (no patentable data), enclose name, address, telephone number of designer and manufacturer, and send to Paul R. MacAllister, 1226 North Dearborn Parkway, Chicago, Illinois. Awards will be presented June 24 at the Ambassador East, Chicago.

Midwest Designer Craftsmen Exhibition, Art Institute of Chicago, to April 26.

Design in Scandinavia Exhibition, Brooklyn Museum, April 19-May 16.

American Society of Tool Engineers 1954 Industrial Exposition, Philadelphia, April 26-30. Ninth biennial exposition at Convention Center will show all kinds of machine tools for processing both standard and newer materials, some for first time. Thirty-five conferences and panel discussions will cover technical advances and production problems.

American Welding Society Spring Meeting and Second Welding Show, Buffalo, May 4-7. The large show, at the Memorial Auditorium, will present an elaborate display of welding equipment and accessories; at the Hotel Statler, some thirty-nine papers will be read on virtually every aspect of welding; visitors may tour plants in the area. Advance registration and hotel information from the American Welding Society, 33 W. 30th St., New York 17.

Sales Aids Show, New York, May 10-12. At the Hotel Biltmore. Visual aids, displays, packaging, etc. Requests for guest tickets, information on exhibition space, may be made to Thomas B. Noble, Chairman, Advertising Trades Institute, Inc., Suite A511, 270 Park Avenue, New York 17.

Basic Materials Exposition and Conference, Chicago, May 17-20. Both exposition and conference will stress new developments and uses for basic materials. Among the topics: peacetime industrial uses for new materials developed for rockets and guided missiles; use of new metal forming processes; use of non-metallic materials. Advance registration cards from Clapp & Poliak, Inc., 341 Madison Avenue, New York 17.

National Plastics Exposition, sponsored by Society of the Plastics Industry, Inc., Cleveland, Ohio, June 7-10. Exposition in the Public Auditorium will represent all phases of plastics manufacture; a technical conference will include reports by plastics users in four major industries. Conference sessions will be at the Hotels Statler and Cleveland.

Columbia University, Science and Engineering Departments, Fifth Annual Conference on Industrial Research, Arden House, June 7-11. Some sixty executives and specialists will discuss the question, "Is research prepared to meet the challenge of economic change?"

College of Engineering, State University of Iowa, 15th Management Course, June 24-26. Intensive course in production planning, plant layout, quality control, labor relations, etc. For information, write J. Wayne Deegan, 118 Engineering Building, State University of Iowa, Iowa City.

National Association of Schools of Design, meeting, Chicago, June 25. At the Palmer House.

Survey Research Center, University of Michigan, Summer Institute in Survey Research Techniques, July 19-August 13. Introductory session June 21-July 16. For information write to the Survey Research Center, University of Michigan, Ann Arbor.

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