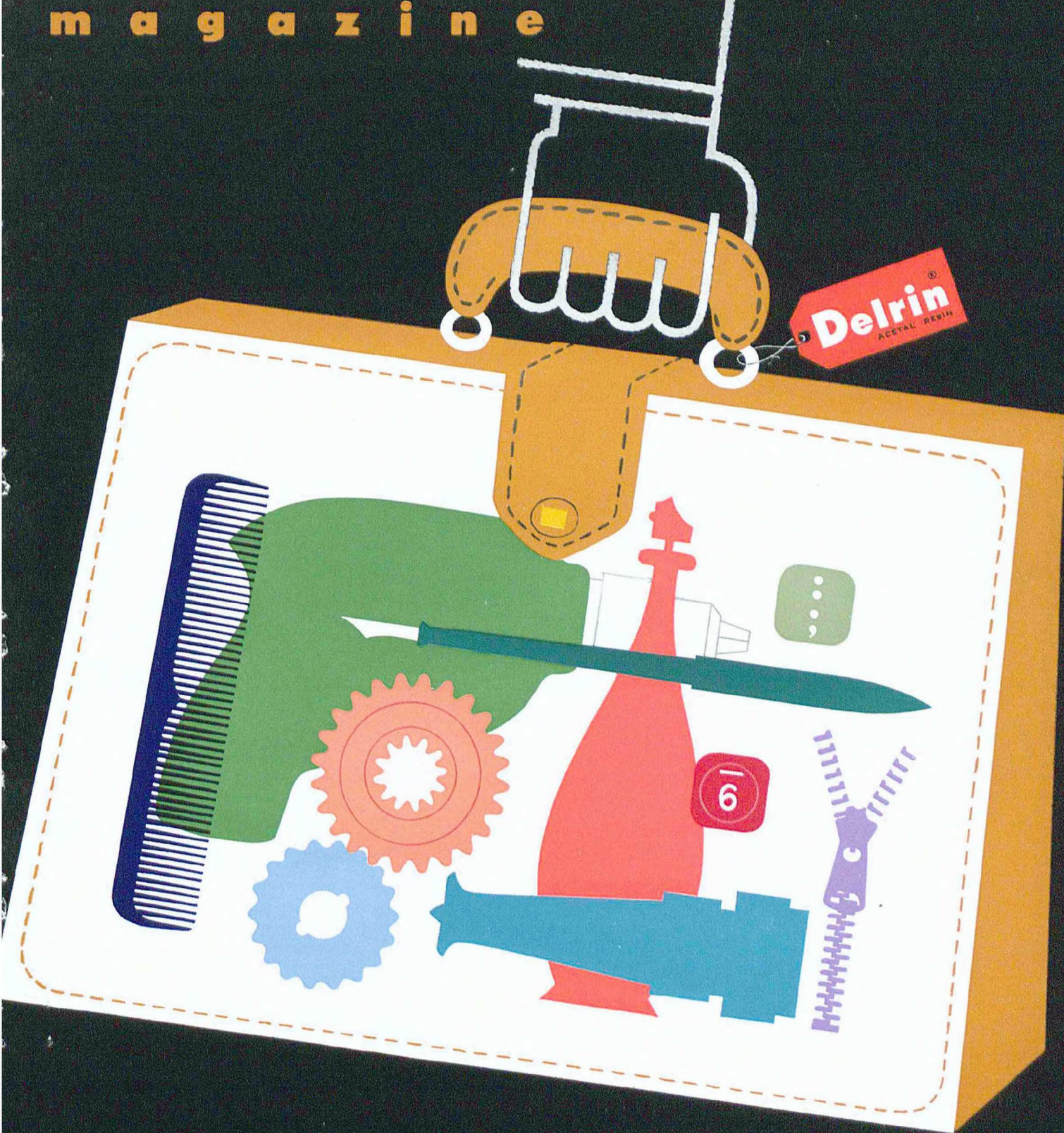


m a g a z i n e



a new plastic hits the road





LATEST IN BATHTUB TOYS?

Hardly. But at three our young lady is more intrigued with the way these nail and hand brushes float than the way they scrub. As their manufacturer, though, we can testify to the quality of their cleaning work. Molded of "Alathon" polyethylene resin and containing "Tynex" nylon filaments, they are chip-proof, flexible and practically unbreakable as well.

From the same materials we also make complexion brushes for Mommy and comb and brush sets for young Susan and her pals. Soap boxes and toothbrush containers in soft, appealing colors are of "Alathon", too.

Look for them under the DuPont label at your department, drug or variety store.

BRUSHES AND COMBS *DUPONT PLASTICS PRODUCTS DIVISION*

Empire State Building • 350 Fifth Ave. • New York City

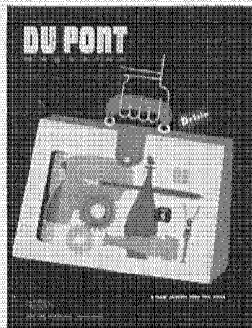


BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



OUR COVER

Cover artist Vince Hoffman gives us an x-ray glimpse into the sample case of a VIP in American business, the missionary for a new product.



In this instance the product is Du Pont "Delrin" acetal resin (see lead article), and the samples include typewriter keys, a zipper, comb, gears, pen barrel and drill handle molded

of the plastic. You can't buy them, because the plant that will make the resin isn't yet in production. But market development and product testing are in full swing, since the questions posed by future users of "Delrin" can best be answered by helping them prove it out.

Note the jaunty swing to the sample case. It symbolizes the optimism we found among the men behind "Delrin".

THE SILENT SELL

Some people have been upset recently by talk about subliminal advertising—a process by which a picture of popcorn, say, is flashed on and off the screen so quickly that you don't know you've seen it but are left with an irresistible urge to buy some.

Nothing to worry about, implies a new report by the Advertising Research Foundation. "The evidence," says ARF, "is insufficient to draw any conclusions about the merits or even the possibility of subliminal advertising."

This takes a load off our minds. We'd been wondering how we could conform. Disappearing ink? Fugitive scents of our better-smelling products sprayed on the page? Now we can stick to the supraliminal without a qualm.

NUMBER ONE FARMER

Here's a salute to Jimmie John Jarnagin, 21, of Jetmore, Kan. This young man with the euphonious name is the Star Farmer of America for 1958, the highest honor bestowed by the Future Farmers of America on one of its members.

Only three years out of the high school where he studied vocational agriculture, Jimmie John already has a \$62,000 equity in a \$111,000 wheat farming and cattle ranching operation. Except for a 160-acre gift from his father, everything he owns he has earned. He now holds title to 1,280 acres and rents 320 more.

We take our hats off to young Jarnagin and his fellow winners in FFA regional competitions. As a supplier of chemical products to the farm, Du Pont is one of 300 corporate donors to the FFA program through the FFA Foundation.

We're happy to congratulate the FFA on still another score. It's heartening to know that these 600,000 American young men can think of something to do with their hands besides beat each other up.

"What we need are more organizations like FFA, not only for young men on farms but for city boys, too," says Clark W. Davis, general manager of Du Pont's Grasselli Chemicals Dept. and a judge in this year's FFA competition.



Jarnagin and ag teacher inspect wheat crop.

ART AND PHOTO CREDITS

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• • • • •

GORDON H. KESTER
Editor

EMILY HEINE
Associate Editor

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COUNTDOWN

As launching time nears for Du Pont

confirming laboratory predictions

More than 250 companies, looking ahead to the first commercial production of "Delrin" acetal resin a few months from now, are evaluating the new engineering material in nearly 500 different test programs.

This intensive activity climaxes four years of end-use testing for the thermoplastic, and right now it's developing an array of parts and products made of "Delrin" that you can expect to see by 1960. Volume production of the resin will begin in mid-1959 at a plant being built at Parkersburg, W. Va. The newcomer will join Du Pont's existing team of engineering plastics—"Alathon" polyethylene resin, "Lucite" acrylic resin, "Teflon" TFE-fluorocarbon resin, "Zytel" nylon resin.

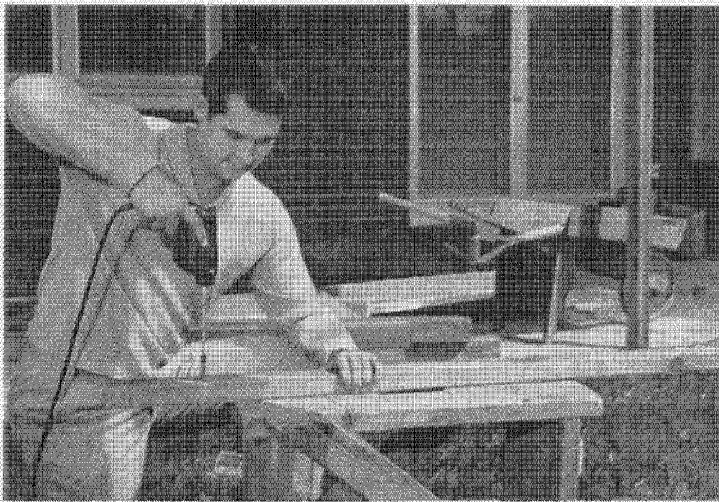
New projected uses for "Delrin" are coming to light almost daily as makers of automobiles, appliances and other consumer products, packagers and machinery manufacturers put the plastic through its paces in their plants and laboratories.

Provided by Du Pont with exhaustive information and suggested applications for the new material, many of them have come up with new ideas—and often finished products—of their own. Current test applications cover all stages from preliminary studies to completed projects and are bearing out performance predictions made by developers of the material.

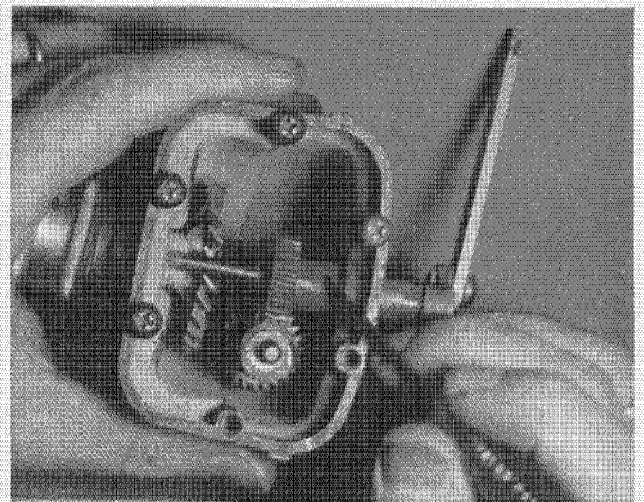
"Reports from the field show that the unusual combinations of properties offered by 'Delrin'—those that are unmatched by



Promising use for "Delrin" is in dashboard instrument housings. Tests indicate they are strong, durable and can be fabricated economically in a full range of colors.



Tests show tough housings of new Du Pont resin reduce chance of electrical shock from power tools when user is "grounded."



These gears, among first made of "Delrin", functioned perfectly through two summers' use in lawn sprinkler.

ON "DELTRIN"

By JAMES H. McCORMICK

new engineering thermoplastic, hundreds of industrial test runs are of a bright future in many applications. Here's a progress report.

other thermoplastics—are impressing potential users most," says product manager Jack Manning.

Automotive engineers have molded the tough plastic into test housings for dashboard instrument clusters, for example. Here, as elsewhere, the design engineer usually chooses a material to do the particular job on the basis of certain property combinations.

No less than nine characteristics of "Delrin" are important for the instrument housings. It forms units that are strong and tough, have the desired stiffness, are dimensionally stable at temperature extremes and under load. They can be made in any color and are easily fabricated and serviced. The plastic automatically becomes an electrical insulating barrier between instruments—raising the possibility that future dashboard wiring might consist of printed circuits applied directly to the housing.

Likely uses for "Delrin" abound in automobiles, in fact. It's being considered for door handles and window cranks, bushings and bearings for suspension systems, gears, housings, casings for speedometer cables and parts for windshield wipers, pumps and carburetors (where its resistance to hydrocarbons pays off).

Mechanically, the testers are finding, "Delrin" thrives on tough operating conditions. In one case, sleeve bearings were made of it for connecting rods in a $\frac{3}{4}$ -horsepower gasoline engine. They remained in good condition for the duration of the test—70 hours of operation at temperatures up to 250°F.

Floor truck casters for industry have demonstrated such low creep—deformation under load—that a weight of 300 pounds on each wheel failed to flatten them, even after prolonged standing. Pipe plugs exhibited this same low creep property by holding a pressure of 500 psi for 150 hours at a temperature of 250°F. The cost-conscious appliance industry also is giving the material a thorough

going-over. After making up a large number of refrigerator handles from it and putting them on test, one company is convinced that "Delrin" offers a 25 per cent cost saving in that application. At the same time, it's good to look at, pleasant to the touch and resistant to kitchen stains and hard wear.

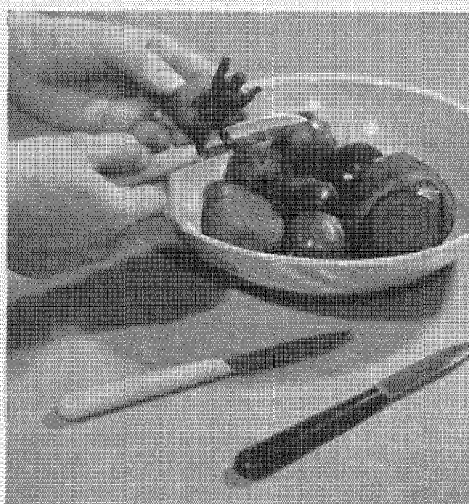
The resin is destined for use in numerous appliances and plumbing fixtures because it is dimensionally stable in cold and hot water and won't corrode. It's a candidate for dishwasher and washing machine parts, showerheads



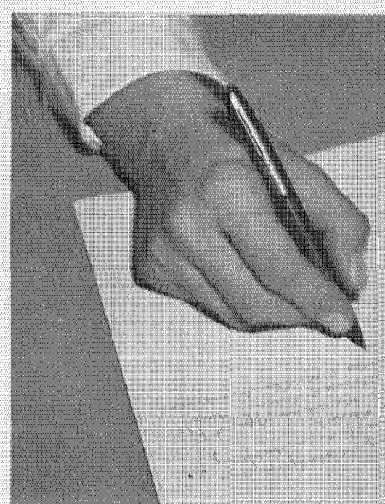
Tumblers, brush backs, combs and other toilet articles of "Delrin" display colorful beauty along with strength, stiffness, toughness.



"Delrin" may appear in dinnerware soon. Material is durable, stain resistant, unaffected by dishwashers.

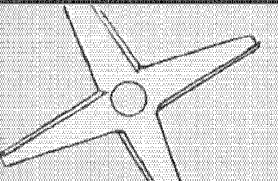
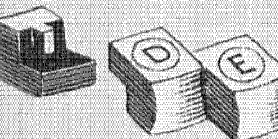
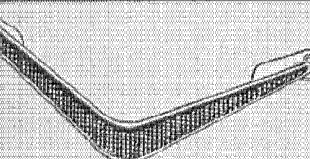
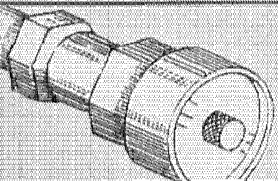
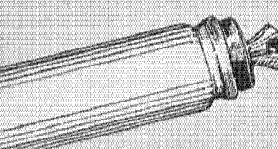
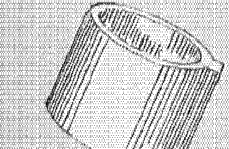
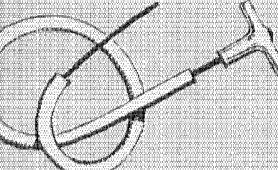
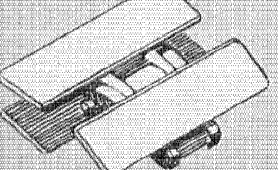
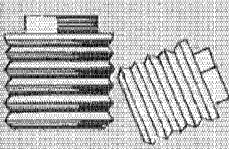
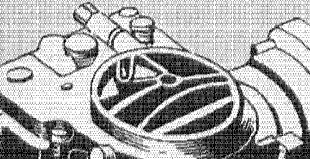


Year of household use didn't loosen or stain paring knife handles of "Delrin".



Pen barrel utilizes both mechanical, aesthetic features of the resin

TO THESE TYPICAL ITEMS... "DELRIN" CONTRIBUTES:

	PUMP IMPELLER	• close-tolerance molding • good abrasion resistance • stiffness at elevated temperatures
	TYPEWRITER KEYS	• permanent color • economical fabrication • excellent stain and solvent resistance
	APPLIANCE HANDLE	• stiffness plus tensile strength • attractive appearance • economical fabrication
	SHOWERHEAD	• dimensional stability • corrosion resistance • range of colors
	PURSE AEROSOL	• solvent resistance and low permeability • attractive finishes • high impact strength
	SLEEVE BEARING	• low friction and creep • toughness and resiliency • good abrasion resistance • solvent resistance
	PUSH-PULL CABLE CASING	• fatigue endurance with toughness and strength • dimensional stability • low coefficient of friction
	CONVEYOR BELT LINKS	• solvent, stain and corrosion resistance • strength and stiffness • low creep and friction
	PLUGS	• toughness and strength • economical fabrication • forms high pressure liquid seal
	CARBURETOR	• solvent resistance • fatigue endurance • tensile strength at elevated temperatures

and components of toilet mechanisms.

This holding of size and shape in water also has helped it win preliminary approval in several multi-link conveyor belt installations, particularly in food and beverage processing plants. Low friction, good wearing qualities and the fact that injection molding of the links is an unusually economical fabricating process also were factors.

In the clothing accessory field, "Delrin" has passed muster in articles ranging from zippers and snap fasteners to buckles and collar stays, largely because of its light weight, corrosion resistance and warm feel. Another feature is being eyed speculatively—it can be dyed as well as pigmented, thus opening up eventual possibilities of dyeing the accessory and fabric at the same time.

Prototype pens and mechanical pencils of "Delrin" show excellent stain and solvent resistance, while toys and sporting goods made from it are tough, durable and colorful.

As a packaging material, the resin has been molded successfully into bottles, caps and closures and aerosol containers. Resistance and low permeability to almost all solvents and many other chemicals make it an excellent prospect for special liquid packaging as well.

A number of companies already have decided to substitute "Delrin" for such metals as zinc, aluminum, brass and steel, or for wood, rubber or other plastics, and the list is growing. They believe the change will improve their products, save them money, or both.

Savings often stem from a reduced need for much of the finishing and machining that metal requires. In addition, because it is easy to fabricate in complex shapes, a single part of "Delrin" frequently can replace several parts normally made of something else. It is easy to injection mold, extrude, blow mold and machine.

"'Delrin' is predictable and dependable," notes Manning. "We believe that, as a member of Du Pont's team of engineering materials, it will pioneer new fields for quality plastics."

That's the course predicted for "Delrin" as launching time nears.



Smooth-running zipper of "Delrin" won't corrode in sea spray. It's one of many clothing-accessory uses expected for material.

Solely for silicon

The world's first plant built solely to produce silicon went into production this year without a hitch. It's Du Pont's new Brevard plant, located on a shaved-off mountaintop in western North Carolina.

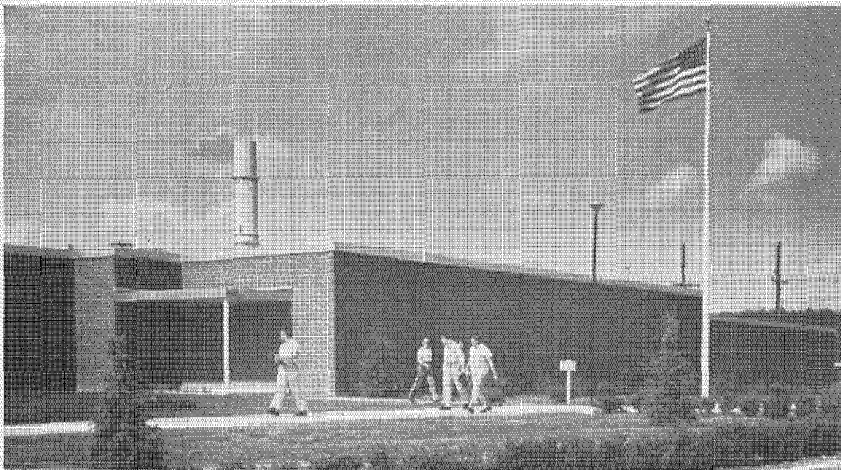
Four grades of hyperpure silicon are being produced here for makers of transistors, rectifiers, diodes and solar cells—semiconductor devices that are vital to the manufacture of more compact and efficient communications equipment.

Everything in and about this sprawling, windowless plant was designed for cleanliness, and it paid off right from the start. Listen to L. S. Grogan, plant manager: "We planned to make a few trial runs and corrections that are nearly always necessary in a new plant, but on the first run the silicon was there—purer than we had ever been able to achieve at our Newport (Del.) facility."

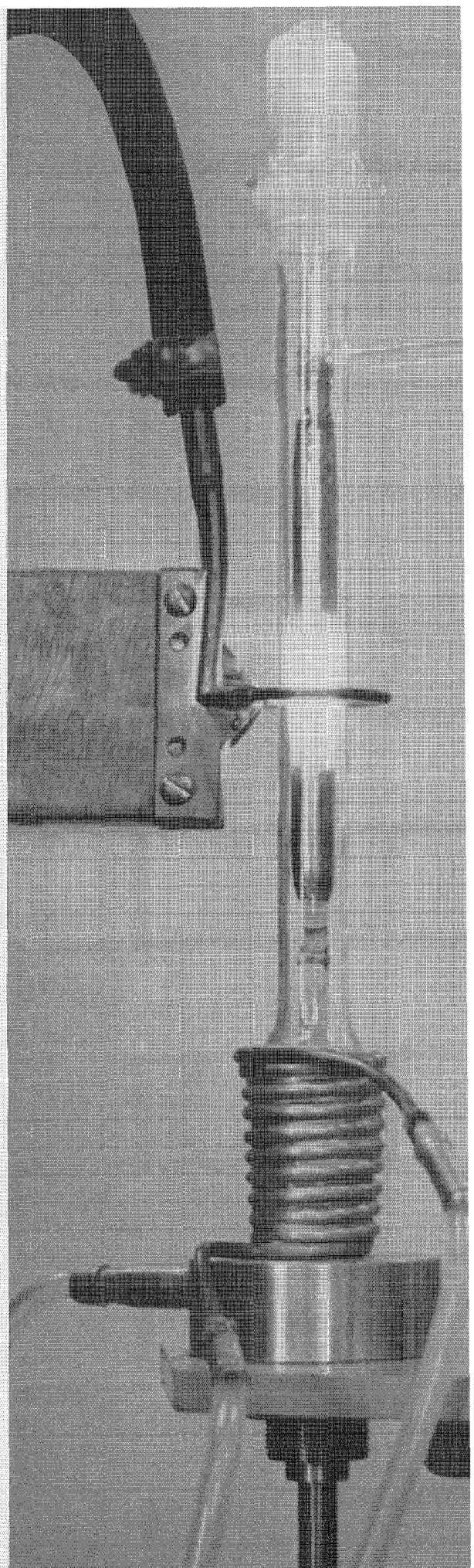
Not so surprising, in light of the planning that went into the project. Site engineers checked more than 100 locations in many states before they chose Brevard for its exceptionally clean air. Even so, all air to the plant is filtered and conditioned as a further safeguard to the critical process. And, most important, everybody in the plant helps to keep it spotless. Grogan himself checks the housekeeping with a white handkerchief.

The plant is aided continuously by the Pigments Department's new technical service laboratory at Chestnut Run, near Wilmington, Del. It double-checks the silicon's characteristics, works on technical problems encountered by customers and does research on techniques. Lately, much effort has been concentrated on the floating zone process, a method of making silicon crystals from rods. The crystals are more uniform than those drawn from melts and contain fewer impurities. A moving molten zone sweeps most of the impurities to one end of the crystal, resulting in a higher yield of usable material. Techniques learned in these experiments are passed on to customers.

You'd think spirits might be dampened by the stiff requirements of silicon refining—the need to hold impurities down to parts per billion. But plant morale is high, and the reason is simple: Silicon's future has never shone brighter.



Air filtering system and absence of windows at new Brevard plant help safeguard silicon process against contaminants. At right, an experiment in floating zone refining is being conducted at Du Pont Pigments laboratory.





First Boeing ship is one of 110 jets American has ordered. All told, airlines anticipate spending three billion on jet equipment over the next few years.

HIGH STYLE

Bright new fabrics!

By LOUISE J. GRUBER

"Good morning, ladies and gentlemen. We are happy to have you all aboard American Airlines' Flight Two, 707 Jet Flagship service nonstop Los Angeles to New York. We will cruise today at 585 miles an hour at an altitude of 35,000 feet. Our estimated flight time to Idlewild: four hours, 30 minutes. Thank you."

With these words from an American Airlines' stewardess next month, the jet age will arrive for coast-to-coast travelers. This is to be the first scheduled passenger run from Los Angeles to New York, and it will take place in early January—six months ahead of schedule.

Everything about American's new jetliner, the Boeing 707, is exciting—its size, its performance, its appearance inside and out.

The swept-wing sky giant offers effortless take-offs and quiet, vibration-free rides at altitudes from 25,000 to 40,000 feet. It has a cruising speed of approximately 600 miles an hour. By contrast, 1933 airliners bumped along at 160 mph and today's top piston-engine plane cruises at about 365 mph.

BIGGER ALL AROUND

The 707's other vital statistics are equally impressive. The fuselage is 36 feet longer and the wingspread 13 feet greater than the largest passenger plane now flying in the U. S. The 707 can lift a pay load of 40,000 pounds—13,980 for the largest piston-engine plane—and can carry as many as 150 passengers.

For the average air traveler, however, the jet's biggest single advantage isn't measured in pounds or in feet, but in time. A passenger now can cross the nation in a mere four and a half hours. Fastest previous time: around eight hours.

Along with this saving of time goes a new atmosphere of luxury in the plane's appointments. The cabin reminds you of a modern living room. The color scheme combines and contrasts shades of blue, turquoise, pumpkin and golden tan; a relaxed mood replaces the often utilitarian



E. Gilbert Mason, AA's director of industrial design, is responsible for interior décor of new jet. Small swatch was inspiration for upholstery fabric. It was duplicated almost exactly by Collins & Aikman, except that nylon was used in final fabric for durability.

FOR THE JETS

make American Airlines' jetliner a veritable living room with wings

flavor of pre-jet planes. This new look is credited to E. Gilbert Mason, American's director of industrial design.

"Designing for jets requires an alertness to innovations in all areas—in fabrics as well as in engineering and styling," said Mason, who's also an architect and industrial engineer. "The new materials, however, must meet the usual stringent requirements for use in aircraft. Fabrics, for example, must be colorfast, lightweight, flame-resistant and easy to maintain."

Nylon fabrics have met these tests in the past, Mason told me, so he turned to them again for the 707. Working with another old hand in this specialized field—Edward A. Smith, sales manager of Collins & Aikman's transportation fabrics division—he selected fabrics of Du Pont nylon for upholstery, curtains, hassocks and carpet.

MAINTENANCE COST A PROBLEM

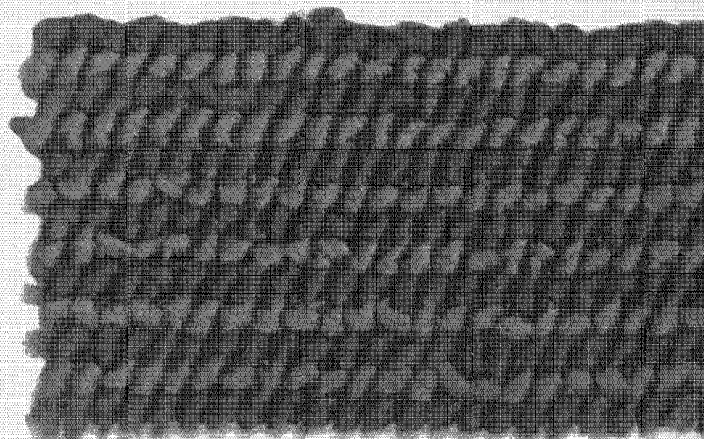
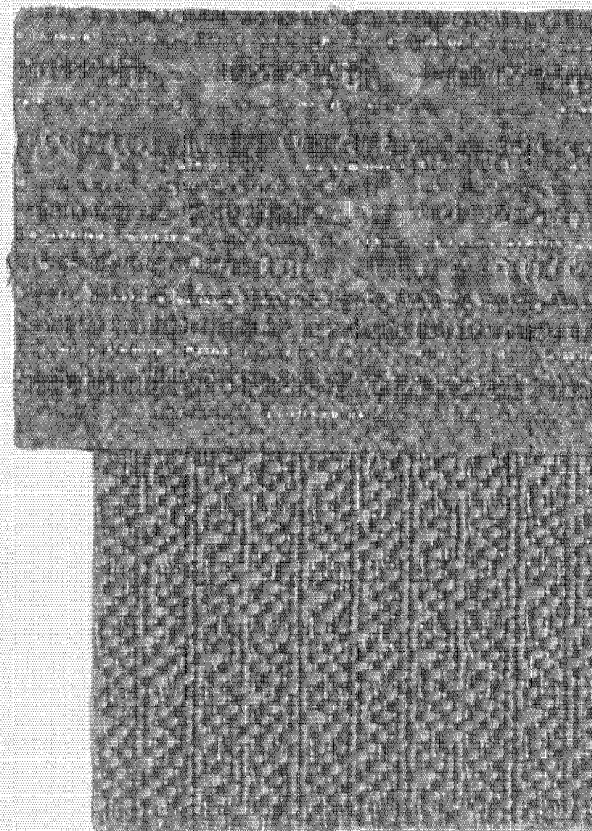
As a specialist in fabrics for the transportation field, Collins & Aikman is well aware of the airline industry's problems. Maintenance costs have been climbing much faster than revenue. Thus a fabric's ability to take abuse and survive cleaning is an important attribute. Collins & Aikman tests all new yarns and fabrics in its plant. When better materials are found, they're recommended to customers. The family of new fabrics for the 707 was developed in this way.

Their backbone is yarn of Du Pont nylon. In the upholstery fabric the yarn is textured to give a soft, bulky surface. Yet the fabrics have high abrasion resistance and tensile strength and can be cleaned easily. In the two-tone carpet, the loop pile of 100 per cent nylon contributes durability and resilience.

Several of these jet-age fabrics gain added glamour from glittering metallic yarns. In all Collins & Aikman fabrics, these yarns are made with Du Pont "Mylar" polyester film. One big reason, says Smith, is that "Mylar" easily withstands the heat of a dye bath. Since it also doesn't pick up dye intended for nylon, the fabrics can be piece-dyed—dyed, that is, after weaving. The film's strength, he goes on, means that metallic yarns made with it resist breaking on the loom.

"We believe Du Pont nylon and yarns made with 'Mylar' are the best available materials for fabrics that have to stand the abuses of transportation use," Smith concludes. "We simply can't make better fabrics today than those we're supplying American for its planes."

Meanwhile, more of the luxurious jetliners are on the way. An estimated 86, operated by eight different airlines, will be in U. S. service by the end of 1959 as the world-shrinking air age enters its latest phase.



Airliner's upholstery fabrics and two-tone carpet are made of Du Pont nylon for maximum wear, ease of cleaning. Thin, strong metallic yarn made with "Mylar" adds beauty.



What do people need? What do they want? Where and how will they get it? When?

At what price? You get the answers by . . . **SOUNDIN**

What unfilled needs do you see—other than a good nickel cigar, perhaps—when you look at the gigantic, complex marketplace that is the United States today?

Your answer has to be based on information that has come your way, whether from statistics or street-corner conversations. Seeking out such facts and drawing conclusions from them are the prime duties of an increasingly important segment of American business—market research.

Du Pont's market researchers see their activity as a sort of radar installation that scans the business horizon, locates significant objects and interprets them for headquarters use. Due to the company's wide field of interest, their objective might be a single "blip" or the entire screen.

A full-scope look turned up these figures recently, for instance: 3.5 million American business establishments have no mechanical air conditioning, nor do more than 90 per cent of the country's 49 million wired homes. Four out of five homes are without freezers, only 5 per cent have dishwashers and 14 per cent clothes dryers.

Those huge potential markets spell unfilled needs, but what are they? That's where groups like Du Pont's Marketing Research Division fill a need themselves.

"How many people actually want the comfort or convenience of those devices?" manager Harold Ladd might ask. "How many of them live where they would be of benefit? What kind, shape and color would suit them best? How much are they willing or able to pay for them?"

The questions could go on endlessly, depending on their purpose. Du Pont makes "Freon" refrigerants, finishes, plastics, wire coatings, insulation and other items used in air conditioners, for instance. Each product would demand its own set of answers before any solid conclusion could be reached as to its future there. Specific answers can be gathered in many ways. The oldest and still most valuable

means used by Du Pont is the trade report from representatives in the field. Its importance was recognized before the turn of the century, and it has been a major responsibility of Du Pont salesmen ever since. In greatly refined form, about a million such reports reach Wilmington every year.

Meanwhile, a new approach to marketing questions was taken in 1935 by a marketing-minded group in what is now the Du Pont Film Dept. The goal: to determine packaging problems of both processors and consumers. The method: a survey. The result: dissatisfaction found with much of the packaging—or lack of it—then in use. The survey and the action that followed it helped set the stage for modern self-service shopping.

ANALYSTS: TO EACH HIS OWN

Similar methods were put to work throughout the company in the years that followed, and now, in addition to the centralized Marketing Research Division, all of the manufacturing departments and some service departments have their own groups. These marketing analysts work closely with trade analysis and sales development sections to find those unfilled needs in the marketplace and point out ways they might be filled profitably.

"One of our jobs is to provide guidance for the departmental units when they plan projects," Ladd notes. "We conduct some industrial and consumer surveys ourselves, too, and keep in contact with information sources inside the company and out. It's up to us to collect basic market research know-how and be able to tell Du Pont customers what services the company offers in this area."

The survey is the marketing researcher's basic tool, of course. Most Du Pont surveys are conducted by independent outside agencies, but only after careful planning





OUT THE MARKETPLACE By GEORGE REYNOLDS

that often includes pilot surveys to insure scientifically valid samplings and questions.

Best known of the marketing surveys, probably, is the one directed at gauging consumer acceptance of a new product or package or of an old product in a new use. One such study, for Remington Arms Co., aimed at finding out what size ammunition carton shooters preferred.

Most of Du Pont's products require some amount of processing before reaching the consumer, however, and here the survey takes on new aspects. It can be directed to the processor to learn his needs or those of his customer; it can go to the man on the street to ask his desires and attitudes as a service to processors.

The Petroleum Chemicals Division, for instance, has underwritten a series of surveys on the service station and the motorist. Oil companies, most of whom use Petchem's tetraethyl lead, dyes and additives, have found the data valuable in their own marketing programs.

An occasional survey shows that a proposed new product either isn't needed badly enough or costs too much to make or convert. This was true of a number of superior military compositions developed during World War II for the Government and which later appeared on the surface to be good products for civilian use, as well.

On another occasion, Du Pont scientists found a less expensive way to make a chemical already in use, but the saving depended on volume production. A survey showed that, although the market would expand greatly at the lower cost, the increase wouldn't be great enough.

A survey subject can be very narrow or very broad. Some years ago, Marketing Research learned that a Du Pont chemist had hit upon a material that formed a tough plastic when exposed to ultraviolet light. He had even made a hardened image of his name from a sheet of this photo-

polymer, indicating its possibilities as a printing device.

When several departments, including Photo Products, expressed interest and posed some ideas of their own, Marketing Research took on the big job of surveying the entire graphic arts industry. A year later it turned over what probably was the most complete economic and statistical summary of the industry ever made.

NEEDS DISCOVERED

Among other things, it isolated several specific needs cited by graphic arts craftsmen which, it seemed, could be filled by chemical improvements.

One of them was a lightweight letterpress printing plate; the new photopolymer offered that and much more if it could be perfected (for a late report, see page 29).

Lithographers, on the other hand, said they particularly needed a dimensionally stable film base for color separation, masking and halftone work to replace glass plates and the flexible films then available. Two years ago Du Pont introduced "Cronar" polyester photographic film base, which not only met the requirements for dimensional stability but added many other improvements as well.

The report still is used and its effects, while not completely traceable, are known to be far-reaching. Not so far-reaching, though, as a pioneer market study that Ladd sometimes cites.

When Eleuthère Irénée du Pont noticed more than 150 years ago that American-made gunpowder was inferior, Ladd relates, he began thinking of making a better grade. But first he canvassed a number of friends about it, including President Thomas Jefferson. Assured that there was an unfilled need for good gunpowder, E. I. du Pont built his first powder mills and founded the company that still bears his name.





Shopper inspects Silver-Chamberlin brush made with colored "Tynex". This is at Lit Brothers, Philadelphia.

Beautiful brushes

Du Pont now offers "Tynex" nylon filament in six becoming shades as color catches on in the brush business

The touch of glamour that color brings to the most mundane objects is being visited now on the brushes that wash your dishes, scrub the bathtub and do a dozen other jobs around the house. The latest evidence: introduction of colored "Tynex" nylon filament to help brush manufacturers give added style to their utilitarian products.

The project got under way earlier this year through Du Pont's Polychemicals Dept., manufacturers of the "Tynex" used in tufting quality household brushes. Polychem set up a Color Coordination Counselling Service, with color expert Faber Birren as consultant, to serve its brush manufacturing customers. Birren, drawing on his knowledge of what women currently prefer in kitchen and bathroom colors, recommended pink, aqua, beige, yellow, red and blue for the nylon. He also suggested complementary

colors to be used in brightening up the brush handles.

Du Pont introduced colored "Tynex"—and the company's new color consulting service for brush manufacturers—in July. At the Housewares Show the same month, sample brushes made with the colored filament were displayed by Silver-Chamberlin Brush Co., Clayton, N.J.

"I held up two brushes, one with plain and the other with colored bristles, and asked buyers' wives which they preferred," said Sam Silver, sales manager. "They were almost unanimously in favor of color for the kitchen and were about evenly divided on color for the bathroom."

Recently Silver-Chamberlin began a test marketing program aimed at enlisting the opinions of more women. Two department stores—Lit Brothers of Philadelphia and the Maison Blanche in New Orleans—installed special

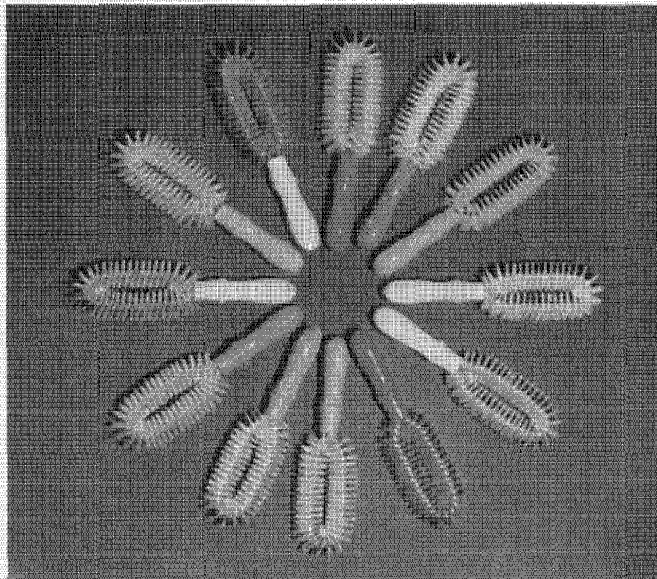
display racks featuring the colorful brushes. Sam Silver, a quiet, dark-haired man whose father founded Silver-Chamberlin in 1907, is keeping close watch on the types and colors sold.

Referring to notes on the back of an envelope the other day, he told us what he had found out so far:

"The bright red is good for the kitchen, but it doesn't seem as popular for bathroom brushes. Also, the traditional black seems to be preferred for clothes brushes. We're learning a lot. The women in Philadelphia and New Orleans are helping us decide exactly which colors we'll offer in which brushes."

Meanwhile, we talked to a few of the Lit Brothers shoppers ourselves. Invariably, we found, the woman who had bought a brush made with colored "Tynex" was keenly aware of the color. One needed a blue bath brush to match her tile, another wanted a beige vegetable brush for the kitchen, a third had bought a pink bowl brush. "This is one brush I won't be ashamed of. I'll leave it out where people can see it," she confided.

Who says a brush is just a brush?



In addition to choosing six colors for "Tynex" filament, Faber Birren picked out these complementary shades for brush handles.

...beautiful locks, too

"It defies logic," says Adolph Jacoby of Meyer Jacoby & Son, Inc., New York wig manufacturer, "but we're loving every minute of it."

The object of Jacoby's mingled incredulity and affection is a development that harks back to the candle-lighted 18th century—women's wearing of wigs as a mark of fashion. The current revival features not only sober black, brown and blonde wigs, either, but shocking pink, blue and green ones to suit a mood or match a costume.

"I pooh-poohed the idea at first," says the wig maker, "but this past summer, in a period when we ordinarily die, we made 5,000 of these things."

Jacoby's colorful new wigs are made of "Tynex" nylon filament blended with other synthetics. He says "Tynex" is the vital ingredient because it gives the wig the body and resilience needed to hold a curl well. Once styled, the fancy headpieces can be brushed or combed

with the same technique women use on their own hair.

Clothing models have been giving the gay wigs a workout ever since the Paris showings last spring. A bathing suit manufacturer provided a fillip for his fall showing in New York a few weeks ago by topping the girls in a rainbow of startling hues (see cut). But less conspicuous women are evidently trying them, too. Leaving their own hair untouched, they're using the wigs to test daring hair colors and styles on a safely temporary basis. The synthetic wigs also have a price advantage. They sell at \$35 and up, compared with \$175 or more for the natural hair variety.

Reflecting the gentlemen's continuing preference for blondes, the new nylon wigs are available in five blonde shades, four other natural colors, six pastels, and streaked or tipped combinations. They're sold through millinery departments and beauty salons of leading department stores.



Models at recent showing of Rose Marie Reid bathing suits wear wigs of colored "Tynex" made by Meyer Jacoby & Son, New York. Women like your wife and mine are buying the colorful headpieces, too, reports the pleased wig maker. They sell for about \$35 each.

"Umpire chemists" of the Mesabi

Lerch Brothers' analyses set the price for a whole trainload of iron ore

Samples of perhaps a quarter of all the iron ore mined in the U. S. pass through the laboratories of a Minnesota company whose members call themselves "The Iron Ore Chemists."

In one year Lerch Brothers, Inc., runs more than a million analyses on the iron, phosphorus, manganese, silica, alumina and moisture present in ore. Appropriately, the company's headquarters are at Hibbing, "Iron Ore Capital of the World," but its laboratories are strung across northern Minnesota and up into Canada.

As soon as the gondola-type ore cars are loaded at the mine, a Lerch representative comes along and takes 22 quarter-pound samples of ore from each. Within the seven hours that it takes the train to reach the loading docks in Superior, Wis., or Duluth, Minn., the laboratory must analyze these samples and submit its report.

Much depends on the accuracy of Lerch Brothers' analyses. Steel companies commonly specify that ore shipments be of certain grades, as rated by the per cent of iron and other materials present. In 1957, for example, 117 grades of ore were shipped from Minnesota ranges.

Analysis is complicated by the fact that much ore is low grade and has to be "beneficiated" by removing unwanted silica or other elements before shipment. Usually this is done by washing, and very often ore still contains

an undue amount of water when it's loaded into railroad cars. Since this drains off during shipment, the lab must duplicate this drain-off in order to determine the natural moisture content. Lerch Brothers has earned the nickname "umpire chemists" because its analyses are accepted by both seller and buyer as a basis for loading ore boats and setting the value of shipments.

Grasselli Chemicals Dept. supplies a variety of reagents—nitric, sulfuric, hydrochloric and acetic acids and ammonium hydroxide—for making the determinations. This simple statement, incidentally, has the weight of 65 years behind it. George and Fred Lerch, the two Pennsylvania brothers who formed the original partnership back in the 1890s, bought Grasselli reagents. "We've used them ever since because we can rely on their purity," the current president, Fred Lerch's son Glen, says succinctly.

The firm is justifiably proud, too, of its long association with various mines. In 1895, Lerch Brothers analyzed the first ore shipped from Mahoning, now part of the world's largest open pit mine, and it has checked the contents of every car since.

"Service is the key," says Glen Lerch. "We've seen the Mesabi through the peaks and depressions and the extra push of wartime. We expect to keep right on doing so as long as there's ore in the ground."



Holding an iron ore sample, Glen Lerch stands beside train whose cargo is valued according to his firm's chemical measurement.



Quick, easy application is cited as a major advantage of push-button colognes.

The success of sweet smell

Women (and men in turn, of course) must always have been attracted to delicate scents. But it's taking the modern aerosol revolution to show how strong a yen it is.

As of this year, whatever their individual choice in scents, women have made it obvious that they prefer cologne in aerosol dispensers. In 1958, for the first time, well over half the retail dollars spent for colognes are going for those in aerosols.

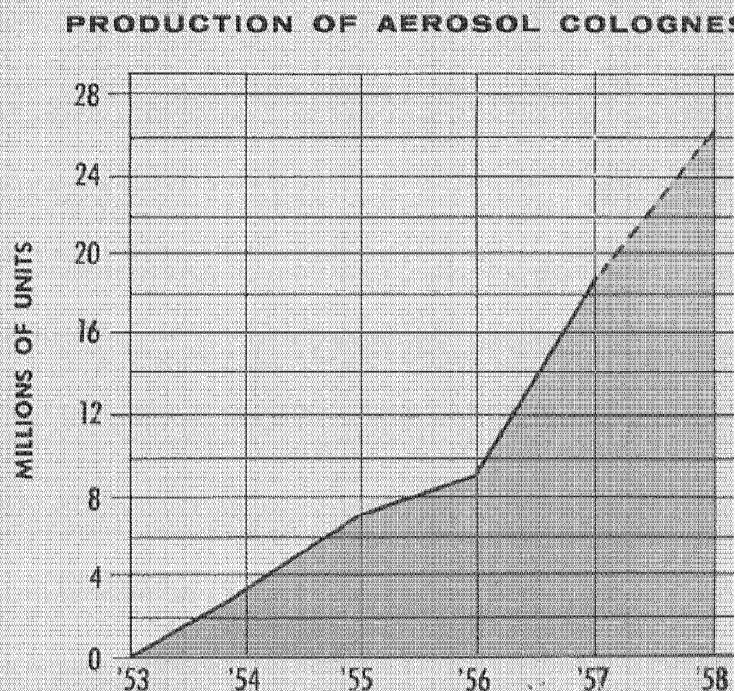
Thus push-button fragrance, although a mere youngster of five, has come of age. First marketed nationally in 1953, sales of aerosol colognes reached 18.6 million units in 1957, more than twice the volume of 1956. The industry estimates that this year's sales will top 26 million units, putting aerosol colognes firmly in the number six spot on the list of best-selling aerosols.

Behind the rapid growth, says a prominent cologne marketer, is this: "Women have found that a fragrance doesn't evaporate or change scent when it's packaged in an aerosol. And it's easier and quicker to apply."

Du Pont "Freon" propellant—key to the World War II "bug bomb" that launched the aerosol industry—has been used to power aerosol colognes from the start. While the business was still in its infancy, Du Pont chemists made a major contribution to its future. Their research turned up improved aerosol systems of "Freon", alcohol and water for use by the packagers. Made available to the entire industry, the data gave new impetus to the growth of push-button fragrance.

The aerosol has sped the growth of the entire cologne industry, in fact. During the five-year period before the pressurized package made its debut, cologne sales rose by \$9 million, but the increase during the five years since has been a whopping \$15 million.

These are some of the reasons why aerosol cologne marketers and retailers are bracing right now for their busiest Christmas season, ready to make the holidays more pleasant for millions of women—not to mention the men.



Graph shows striking growth (1958 production is estimated)

NOW THEY'RE HEATING WITH PAPER

An ordinary-looking piece of paper with copper foil strips along opposite edges is the heart of a new kind of heating element that promises to be warmly received by designers.

The wireless heater is as efficient as it is simple. When the two foil "busses" are energized with electricity, the paper gives off heat over its entire area. Since there is very little heat inertia compared to conventional elements, it heats up and cools off quickly.

This intriguing product is the brainchild of a young Canadian-American, Robert Smith-Johannsen, who calls it "Cellotherm" heater. Often it's laminated between thin layers of electrical insulation, such as phenolic paper, and this material is referred to as "Lamitherm" heater. Smith-Johannsen's company, Chemelex, Inc., of Niskayuna, N.Y., markets both.

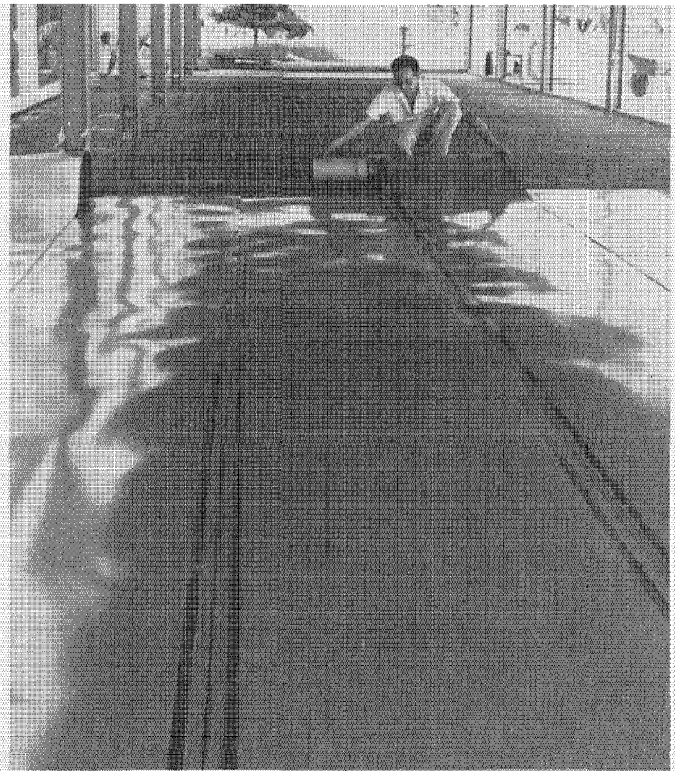
"Cellotherm" can be applied to ceilings, walls and floors as a wallpaper or building paper. It also can be buried in driveways, airport runways and other outside areas to combat ice and snow accumulation. "Lamitherm" can be used to make food serving equipment, bakery tables, industrial piping and screen-type room heaters.

A chemist and a skier, Smith-Johannsen occupied himself a couple of years ago with making a new kind of ski wax. Among the ingredients was "Ludox" colloidal silica, a Grasselli material notable for the uniformity and submicroscopic size of its particles. It's more commonly used as an antislip agent for floor waxes and paper and as an antisoil treatment for home furnishings.

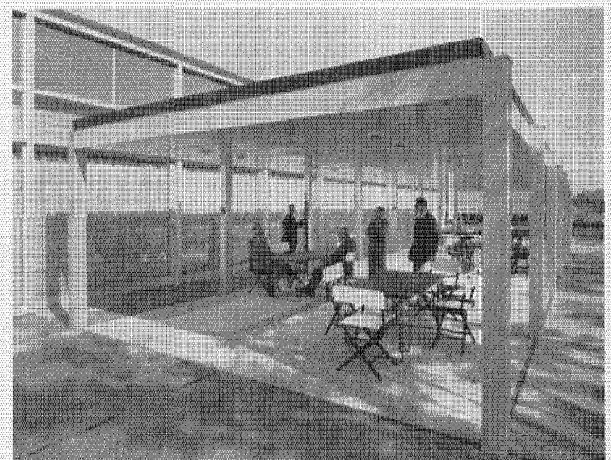
Anyhow, Smith-Johannsen hit one combination of materials, including "Ludox", that seemed to make the bottoms of his skis conductive. On impulse he painted some of it on paper and hooked up the sheet electrically. Sure enough, current flashed through it and radiant heat was given off.

Smith-Johannsen shelved his ski waxes and concentrated on radiant heating paper. His first experiments at applying the coatings left something to be desired from the viewpoint of both uniformity and cost. At the crucial moment, however, he found a way to add the electrically conductive material at the papermaker's beater so it combined with the cellulose before paper was formed. Collaboration with Decora Corp., Fort Edward, N.Y., then led to a method for continuous production of the element. Chemelex, Inc., was in business.

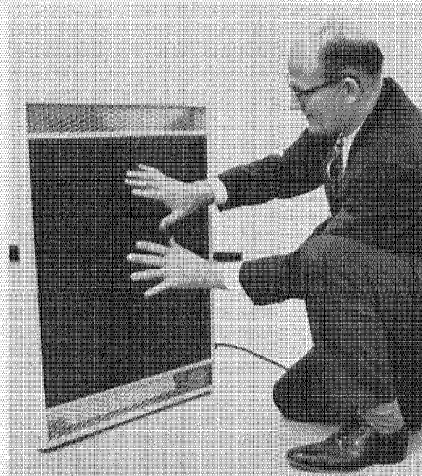
Chemelex also has come up with a high-temperature "Asbotherm" heater, using asbestos in place of cellulose, that can be heated to 600°F. Finally, a way of coating the conductive materials on paper appears to be within reach. Both Decora Corp. and the technical specialties laboratory of the Oxford Paper Co., Rumford, Maine, have made headway toward this original goal of Smith-Johannsen.



Radiant heating of outdoor dining pavilion in Spokane, Wash., is accomplished with the conductive paper, here being installed.



Pavilion, part of Washington Water Power Co.'s new building, also has heating panels on underside of roof.



Robert Smith-Johannsen, head of hot business in heating papers, tries a "Sunglo" heater made by Rototiller, Inc., using the conductive material. Screen warms up quickly.

POST INFLATION:

NEW TECHNIQUE FOR NYLON TIRES

A new tire-making technique solves for many truckers the old problem of untimely tire death caused by tread cracking, cuts and ply separation.

The method—called post inflation—is disarmingly simple. A hot nylon cord tire, fresh from the mold, is inflated with air. It then cures under pressure at close to the dimensions it would achieve in service. This prevents the cord from shrinking as it cools, which would contract the tread grooves. The result is that when the tire goes into service on the highway the cord isn't forced to "grow" back to service dimensions. This growth puts a strain on rubber that can cause cracks in the tread channels, make small cuts bigger and hasten ply separation.

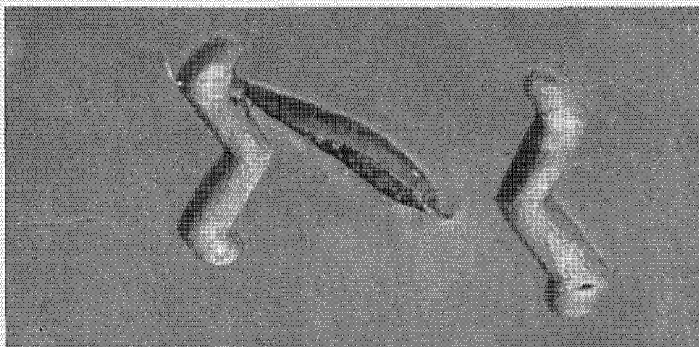
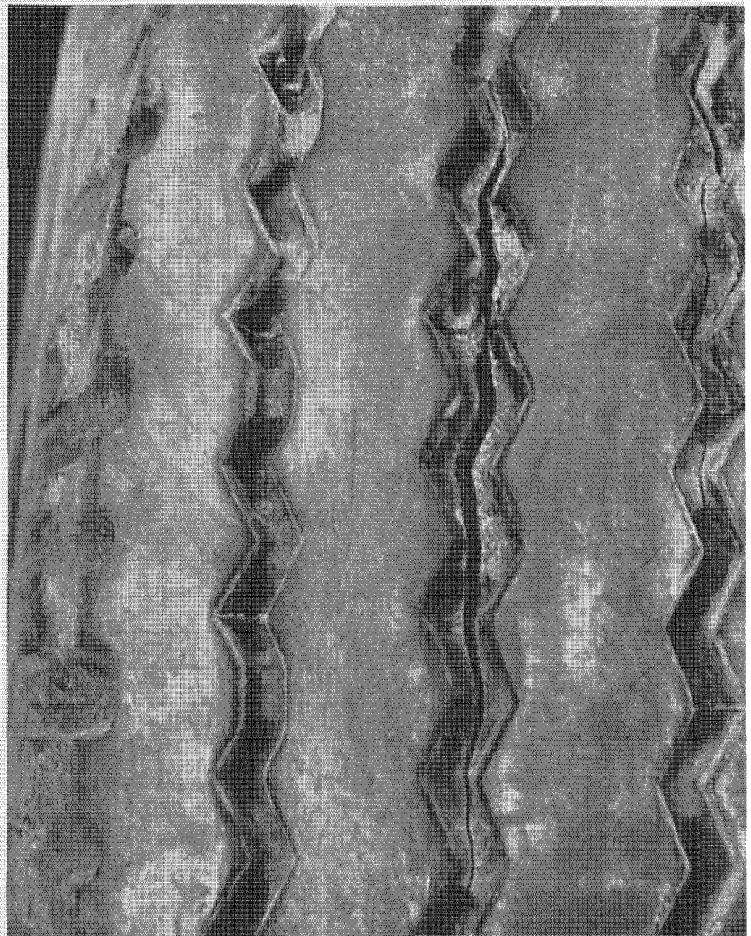
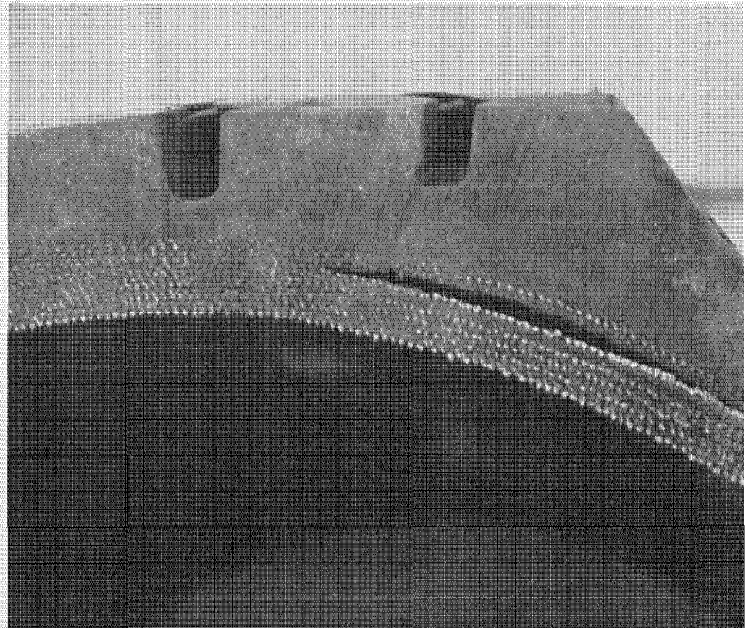
Until the new technique was worked out, tire makers minimized the growth problem by using more fabric plies. This wasn't too satisfactory because it made tires stronger than load and road factors warranted. It also led to a hotter running tire and the danger of heat damage.

By using the new technique to minimize growth, tire makers now can take fuller advantage of nylon's strength and reduce the number of plies. Already being built by several tire companies is a cooler running 10-ply nylon truck tire. The next step is 8-ply, then 6 and maybe even 4, the experts claim.

Du Pont's Textile Fibers Dept. has worked with tire company engineers over a period of several years to bring about these improvements. Development of post inflation for passenger tires preceded the knottier problem of bringing its benefits to truckers—knottier because of the greater number of plies involved and the variety of load and side forces on such tires.

In a recent test by a large truck fleet based in the mid-South, post-inflated nylon tires were compared with standard production tires. Twisting mountain highways, uneven city streets and high-speed turnpikes offered a broad sampling of surfaces and speeds. Results? The post-inflated tires showed a drastic reduction in growth. Tread cracking was practically eliminated, permitting the trucker to run off all of the tread for greater mileage.

More tests are under way, but the engineers already have learned enough to summarize the value of post inflation thus: Lots more tire miles for your tire dollar.



Common types of tire damage checked by post inflation: cut, left; ply separation, top right; and tread cracking.



NEW ARTERIES FOR OLD

Nylon was one of the first man-made fibers to replace injured and diseased blood vessels. Now artificial arteries woven of DuPont "Dacron" polyester fiber and "Teflon" TFE-fluorocarbon fiber offer improved parts for this vital surgical repair work.

By WILLIAM MANN

When Charles Marshall of New Shrewsbury, N. J., a very active hosiery manufacturer of 53, became alarmed at the constant numbness in his left leg and a painful swelling behind the knee, he went to see his doctor. The doctor diagnosed the trouble as an aneurysm—a large, permanent dilation of the artery.

"There's a very large blood clot in it," the physician added sympathetically. "It presses against the nerve and it hurts, I know. There's always the danger of rupture, and a new artery may be required. You'd better go see a specialist at the Medical Center in New York."

Not much different was the experience of Mrs. Pauline Babel, a bright-eyed Bronx lady of 72. For seven years she had suffered from an ulcerated ankle associated with a blocked artery. Several operations and a number of extended hospital stays had brought no lasting relief. Now she moved only on crutches and with excruciating pain.

Then one day Mrs. Babel tuned her TV to an audience participation program and heard a policeman report his recent recovery from a severe bullet wound in the leg. By inserting a synthetic artery, his doctor had probably saved him from an amputation, he said.

As Mrs. Babel listened, she felt an irresistible compulsion to get in touch with the policeman's doctor. This was arranged through the TV show, and the California physician advised her to see a vascular surgeon at the Columbia Presbyterian Medical Center in New York.

Thus it happened that both Charles Marshall and Pauline Babel came under the care of Dr. Ralph A. Deterling, Jr. He accepted them as patients eligible for synthetic artery grafts and operated on them. Today they are both well and active. Marshall, free from leg pain and numbness, carries his 25-pound sample case everywhere. He also carries a new synthetic artery, made of "Dacron" polyester fiber, across the back of his knee. Mrs. Babel has abandoned her crutches and walks without pain or effort. An artery of "Dacron" runs the length of her thigh.

"God bless Dr. Deterling," Mrs. Babel told me recently. Marshall echoes the benediction.

200 PATIENTS HAVE BENEFITED

Dr. Deterling, associate professor of clinical surgery at Columbia's College of Physicians and Surgeons, is a tall, sturdy man of serious mien. Despite his youthful 41 years, he is already an acknowledged authority on thoracic surgery and blood vessel replacement. During the past seven years he and his associates have restored about 200 patients to new health with synthetic arterial grafts, most of them with complete success.

All told, thousands of arterial graft operations have been successfully carried out by many other doctors all over the world. Most replacements have been of such large arteries as the aorta and its main branches. Life without these vessels isn't possible, hence surgeons have given priority to perfecting graft techniques for them. Lately, surgeons also have



Free to walk again without pain, hosiery maker Charles Marshall carries artery graft of "Dacron" behind knee.

worked out techniques for grafting smaller and less critical arteries of the type required by Marshall and Mrs. Babel. The small vessels, though, still pose extremely difficult mechanical problems.

Even so, the successful substitution of synthetic materials for segments of diseased or injured arteries represents a major triumph of modern surgery. It is the realization of an ancient dream of surgeons, a dream that had to wait until the proper materials could be developed to make it possible.

Among the pioneers who fully understood this materials problem was Dr. Alexis Carrel of the Rockefeller Foundation for Medical Research. This great American surgeon and biologist, who received the Nobel prize in 1912 for his contributions to the joining of blood vessels, transfusions and the transplantation of entire organs, was one of the first to consider the use of artificial materials for artery replacements.

He experimented with glass and paraffined metal tubes on animals, although his work was directed toward human needs. His efforts to find a workable material weren't successful, but Dr. Carrel predicted that some day the use of artificial arteries in man would be achieved. He died in 1944 before the next great step forward could be taken.

The advent of synthetic fibers revitalized the whole idea of blood vessel replacement. In 1951 Dr. Arthur B.

Voorhees, Jr., working with Dr. Arthur H. Blakemore at Columbia Presbyterian Medical Center, demonstrated the feasibility of a synthetic fabric for blood vessel replacement. Progressive surgeons dared to look forward to a plentiful supply of soft and pliable fibrous tubes, easy to sterilize and preserve, available at relatively low cost.

The ideal tube, the doctors decided, would have low porosity, high tensile strength and a very high degree of chemical resistance. It also would keep the deposited fibrin layer to a minimum; a heavy deposit increases the danger of blood clots and delays healing. This meant that a good synthetic artery would have to be compatible with body tissues to promote rapid and permanent healing. With these requirements in mind, surgeons all over the world began to study the properties of the new fibers and to use them in many weaves, knits and forms.

Nylon was among the first synthetic materials to be properly fabricated and successfully implanted. Many patients of Dr. W. Sterling Edwards of the University of Alabama have benefited from the pioneer Edwards-Tapp crimped nylon artery. In a newly published study, however, Dr. Edwards reports: "The woven, crimped tube made of 'Teflon' TFE-fluorocarbon fiber now is the graft of choice in this clinic."

"Considering the complex combination of properties that must be taken into account," Dr. Deterling told me, "I consider both 'Dacron' and 'Teflon' superior materials at the moment."

HIS CHOICE IS "DACRON"

Other surgeons have made important contributions to the new science. Dr. Michael E. De Bakey of Baylor University has done much successful work with grafts of "Dacron". In the past six years he and his associates have made more than 1,800 vascular replacements.

"In our earlier experience we used homografts—natural arteries—predominantly," wrote Dr. De Bakey recently. "But on the basis of experimental and clinical investigations we gradually shifted to the use of synthetics. In the past year and a half we have used flexible knitted tubes of 'Dacron' almost exclusively."

Dr. J. Harold Harrison of Emory University, who also has studied many kinds of materials, now prefers "Teflon". "At the present time," he reports, "I feel there is little question regarding the graft of choice for replacing large blood vessels. Experimental evidence shows that grafts of 'Teflon' are accepted by the body and remain workable over a long period of time. This makes them definitely preferable to a homograft. For the replacement of smaller vessels, again the synthetic material of choice is 'Teflon'. Here we know which is the best material, but I am afraid the mechanical problems are not all solved."

There is reason to believe that these problems—primarily involving tube construction—will be hurdled eventually. Many able vascular surgeons, fiber manufacturers and prostheses fabricators have teamed up for this important job. The United States Catheter and Instrument Corp. of Glens Falls, N. Y., George P. Pilling & Son Co. of Philadelphia, Dormeyer Corp. (Meadox Weaving Division) of Haledon, N.J., and John Sidebotham, Inc., Philadelphia, already have made valuable contributions.

This pooling of medical, industrial and technical talent has resulted so far in the saving of thousands of limbs—and lives. Sufferers and ex-sufferers alike will continue to bless these efforts.

CLEAN FACE FOR PRINTED CIRCUITS

The girl and her scrub brush looked out of place beside an assembly line turning out printed-circuit boards, but her old-fashioned solution to a modern problem had to do until a better one came along.

The brush was the only way one electronics equipment maker had found to rid his bright new boards of excess soldering flux. Like others in the fast-paced industry, he had tried numerous solvents, but none did the job just right.

Some solvents attacked the plastic board itself; others softened the adhesive holding the thin copper circuitry in place, damaged printing and color codes or simply didn't dissolve the rosin flux. The best one he'd found left behind a white residue which the girl had to scour off with her brush.

Then, recently, a Du Pont salesman paid him a visit. Chemists in the "Freon" Products Division, he said, had come up with a new solution that would dissolve the flux, wash it off completely and dry away in minutes. "Show me," said the plant man; the salesman did.

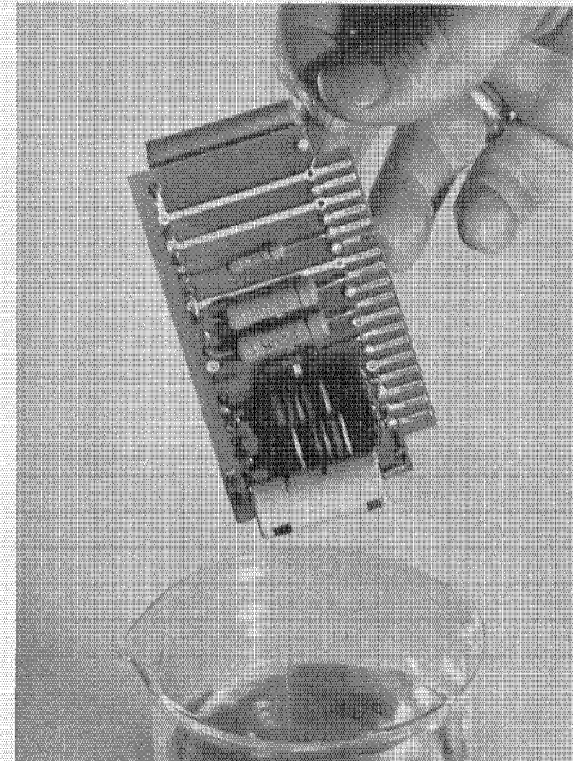
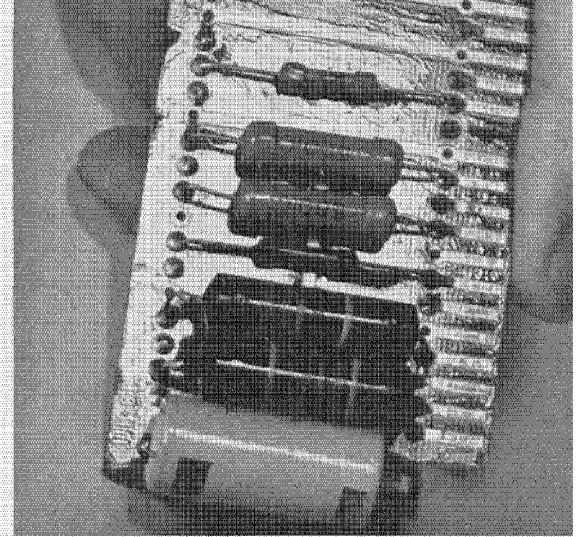
The new solution is a mixture of Du Pont "Freon"-TF solvent and specially denatured anhydrous ethanol. While it cleans the circuit boards thoroughly, it doesn't affect the construction materials, color codes, printing or identification labels. In addition, the solution is nonflammable and nontoxic.

A residue of rosin flux on the boards after the resistors, capacitors, transistors and other such components have been soldered in place has several drawbacks. By nature, the flux is corrosive. It also contains amine salts that absorb moisture in time, allowing voltage leaks and shorts across the narrow spaces between conductors. And, particularly in the case of computers and other such expensive equipment, clean circuit boards help reflect good workmanship.

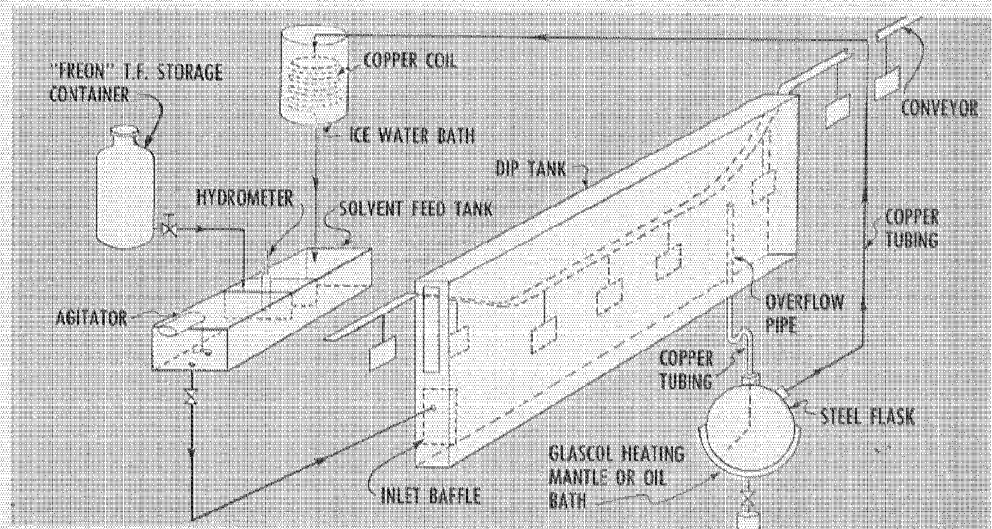
The new solvent can be purified, recovered and re-used successfully. Du Pont technicians achieved a recovery efficiency of 92 per cent, and they have coupled the purification and recovery units with a continuous cleaning system designed to make the whole process automatic.

A sketch of their suggested apparatus appears below; they'll provide detailed information to makers of printed circuits who write to the "Freon" Products Division, Nemours 2420-DM, Wilmington 98, Del.

Shiny coating of soldering flux on printed circuit, top, washes off easily when dipped in new, quick-drying solvent blend.



Main components of automatic cleaning system for printed circuits using new solvent solution are shown in sketch. "Freon" Products Division technical men designed the equipment for continuous operation with recovery of the solvent for re-use.





Peterson and Tucker check on progress at their Rosetta No. 3 drill rig 30 miles north of Anchorage.

ALASKA'S "POOR BOY" OILMEN

*Two erstwhile coal operators from Anchorage
have helped focus interest on what may be
one of the richest oil areas in the 49th state.*

*Their shoestring search for petroleum
has blazed a trail that the major oil
companies now are following. Here's their
story, told by a writer who knows them both.*

By THOMAS C. McCLARY

ANCHORAGE, ALASKA

Thirty miles north of here an incredible pair of wildcatters named Tucker and Peterson are drilling for oil. In their opinion they are sitting on top of a structure even richer than the one that produced Richfield Oil Corporation's 900-barrel-a-day well last year on the neighboring Kenai Peninsula.

Whether they strike it rich or not, the pair will go down in local history as the ones who "smelled" oil

in an area where prospecting had been at a virtual standstill since 1939.

"The Anchorage oil boom was started here on Susitna Flats seven years ago," George Tucker told me the other day. "It was started by Alaskans with very little except a prayer, vision and faith. But I'm glad that the big companies finally came in. Development of the industry needs that kind of capital and Stateside publicity."

Tucker and Ralph Peterson had no intention of transforming themselves from coal operators to oilmen until they hit a pocket of natural gas one day in 1951 while poking into a coal seam. Analysis of the gas disclosed its petroleum origin. Their first thought even then was to unite a group of local leaseholders into a company and sell the leases to some oil firm.

Ordinary citizens of Anchorage—138 of them—responded. Among the group filing for leases were an insurance man, an engineer, a lawyer, a restaurant owner, a fireman, a city councilman—the sort who had come to Alaska to stay and to build.

That was in 1952. For two years George Tucker traveled the States at his own expense, shopping for someone willing to take over and develop the group's leases.

All he found was skepticism about the land of ice and igloos. He carried movies and slides to disprove it—Anchorage actually has a relatively moderate climate—but the skepticism remained. Finally, with the leases in danger of running out for lack of development, Tucker came back home.

"Hell," said he, "we'll go after the oil ourselves."

The result of that decision was the Anchorage Gas and Oil Development Co. Then the pair began "poor-boying" in earnest. Their first drill was a little jackknife rig, and their first tower was erected from the diagram in a book. George Tucker even acted as his own drill pusher for four years, learning the craft from a 30-day trip to the States, a few talks and some careful study. Yet when geologists took readings on the AGO wells, they found them plumb to depths of more than 5,700 feet.

Even more astonishing to the oil fraternity, the two amateurs had dropped two wells and several test holes totaling more than 10,000 feet, acquired rigs and equipment and paid the rent on 86,000 acres—all for less than \$750,000. And this in a country where a single well can cost as much as \$7 million! On top of this, Tucker and Peterson had gathered geophysical data that stimulated further exploration of the Cook Inlet area.

A MATTER OF NECESSITY

Tucker and Peterson have kept costs down by squeezing nickels. This is admittedly difficult in a land where wages are high, transportation costs unbelievable and where both summer thaws and winter freezes raise expensive problems. But the "poor boys" have either had to scrimp or call it quits.

"In the case of ditching for drainage and water supply, for instance, we save 28 cents a cubic foot and a lot of time by using Du Pont ditching dynamite," Tucker told me. "We once used shovels and bulldozers and laid log mats. The ditching powder is more efficient and costs us only ten cents for every dollar we used to spend on the old method."

Another Du Pont explosive, "Nitramon" S blasting agent, has come in handy on seismographic work, Tucker said. This is because so much of the geophysical mapping here must be carried on in muskeg swamps, and "Nitramon"

S was created especially to stand the rigors of wet-hole shooting. The subterranean echoes of the blast are then converted to electrical impulses and traced photographically on Du Pont Seismo-Writ recording paper.

"The clarity and sharp contrast of the seismographic records have been commented on very favorably," said Tucker. "Irene Ryan, our geologist—incidentally, she's one of the few women oil geologists in the world—gives much of the credit to these products."

Geophysical exploration, like everything else in Alaska, is expensive. It costs as much as \$25,000 to keep a single air-ground seismic crew in operation a week. This, coupled with the millions of acres to be surveyed, explains why normally secretive oilmen are being abnormally fraternal here. There has been a wide exchange of geophysical data among the companies, a practice that is accelerating the mapping of the new state for its oil-bearing potential.

How big is the potential? Standard Oil geologist Wallace Pratt evaluated Alaska as one of the four really great oil-bearing areas of the world, along with the Middle East, Southeast Asia and the Gulf of Mexico. And the chief geologist of another major company thinks that the Cook Inlet provinces alone may prove richer than Saudi Arabia. But exploration will cost \$100 million, the Anchorage Chamber of Commerce figures, plus another \$200 million for facilities when and if the search is successful.

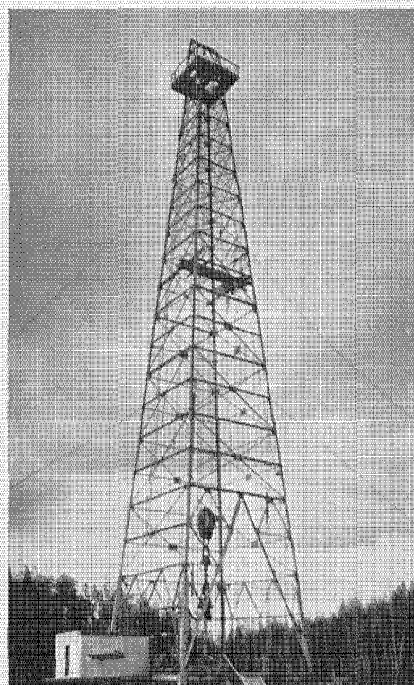
Tucker's own Rosetta wells on the Susitna Flats have shown cores of solidified petroleum, plus shows of liquid oil and gas. But that's no guarantee of success. Even experienced oilmen are finding the tumbled structures here the most difficult to define they have ever encountered.

"Oil could be 100 feet under your drill and you might never get an indication of it," Tucker said.

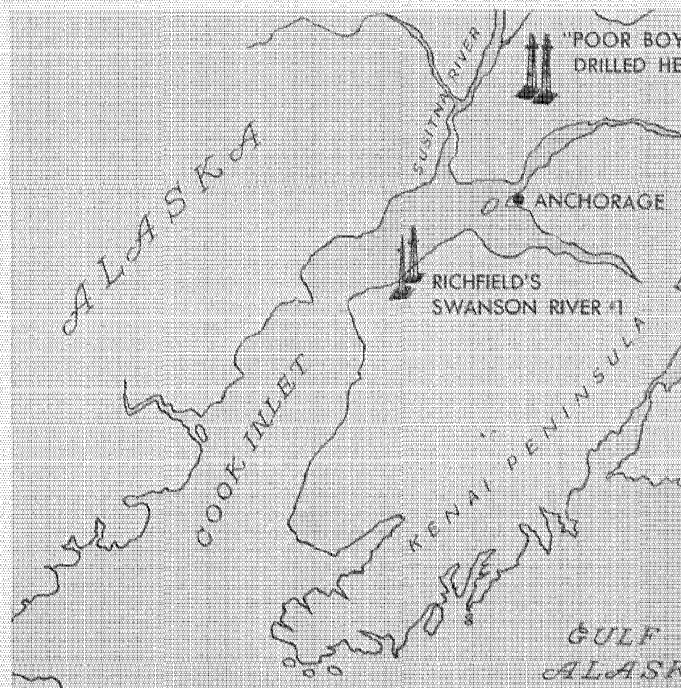
The drilling? Well, veteran drill pushers recently worked clear around the clock to drop a hole 20 feet a day. And in two hours' time the drilling rate at AGO's Rosetta No. 3 dropped from four and a half to less than two feet an hour.

Troubles there are aplenty. But Tucker and Peterson and scores of more experienced oilmen aren't letting the troubles stop them. The promised rewards are too great. Rooting from the sidelines, of course, are 213,000 citizens of Alaska whose state treasury would share in oil royalties.

Despite difficulties of seismic prospecting in Alaska, left, search for black gold goes on. More and more rigs like Rosetta No. 3, right, will be dotting wilderness.



Exploration of potential oil lands in Cook Inlet area will cost \$100 million, Chamber of Commerce estimates.





In the early 1900s, the roll-top desk was the typical executive office. Here, with a filing system known only to himself, the man of business kept essential papers at hand.

AT HOME IN THE

Executive suites take on a "lived-in" look that's pleasing

"Mr. B works a full day and moves around a lot in the office," notes the secretary of a textile company president who recently moved his firm into new quarters. "In the morning he and his visitors often use the big chairs and sofa. He finds the coffee table too low to work at, though, so pretty soon I see them drift over to the big table. When more than four people are involved, it becomes a meeting and they usually go next door to the conference room."

With its thick carpet, blue walls and geometrically printed draperies in harmonizing colors, the office she was showing resembled a severe but expensive living room. The executive desk was of moderate size with light, graceful lines. It was apart from two other areas—one a conversational grouping of upholstered arm chairs and sofa around a coffee table, the other a conference center with large table and several straight wooden chairs.

Mr. B's office is representative of a growing number of executive suites. "The office has changed much more than the living room in the past 40 years," a furniture designer remarked recently. "At home a man may sit in either an old-fashioned rocker or a modern Eames chair. When he steps into the office, though, he generally rejects any furniture that belongs to an earlier day."

At the end of World War I, the businessman was still under the influence of the roll-top desk. In an earlier day this had been his office. Tucked away in an odd corner of the plant, it offered dust protection for a few necessary papers. As the ways of doing business changed, a shift occurred in offices. Fleeing the noise of typewriters, telephones and the hurrying steps of their subordinates, the bosses retreated to private rooms and, as barriers between themselves and outsiders, threw up desks that sometimes assumed monumental proportions.

Once again, the businessman's concept of his office is changing. Now, according to one close student of executive psychology, many men see their desk as something to work *through* rather than *at*. "A big desk may intimidate visitors," this man relates, "so the executive orders a smaller size. He's frequently in conference, so he likes the table idea. Or he asks for an overhang on the desk, so that visitors who pull in close won't bump their knees."

Improvements in executive office furniture have been spurred by the advent of the dealer specializing in this sort of equipment, says Robert Fleming, sales manager of

the Leopold Co., Burlington, Iowa. Fleming, whose company has made office furniture since 1876, recounts early marketing difficulties when the only outlets were household furniture or stationery stores.

Office furniture manufacturers also have hired designers who respond to advances in architecture, art and interior decorating. Just after World War II, the Herman Miller Furniture Co., Zeeland, Mich., engaged a young designer to modernize severely conservative executive furniture. George Nelson responded with an L-shaped desk consisting of a wooden slab for paperwork and a separate storage unit.

"When you break up the monument desk, you knock down the wall between an executive and his associates," Nelson said the other day. "The desk-as-a-table trend may well go still further, keeping pace with the conference method of doing business."

Nelson, whose company designs entire offices as well as furniture, approaches assignments with enthusiasm and a lively sense of humor. "When I'm called to design an executive office, I begin by asking some rather impudent questions," he says. "'What do you keep in your desk drawers?' and 'What is it you *really* do?'" The answers I get aren't always true ones, of course.

"A man may tell me he needs a large desk because he has many papers. Actually, he wants one that's bigger than someone else's. If he has no insecurity, then the designer gets someplace. But at first a man is often afraid to be aesthetic, and we get a lot of rough diamond talk about work being the only thing that matters." To overcome this, Nelson may suggest a lavender desk with, say, a green top. "In a minute the man is tearing that idea to pieces and I'm getting his ideas," he says.

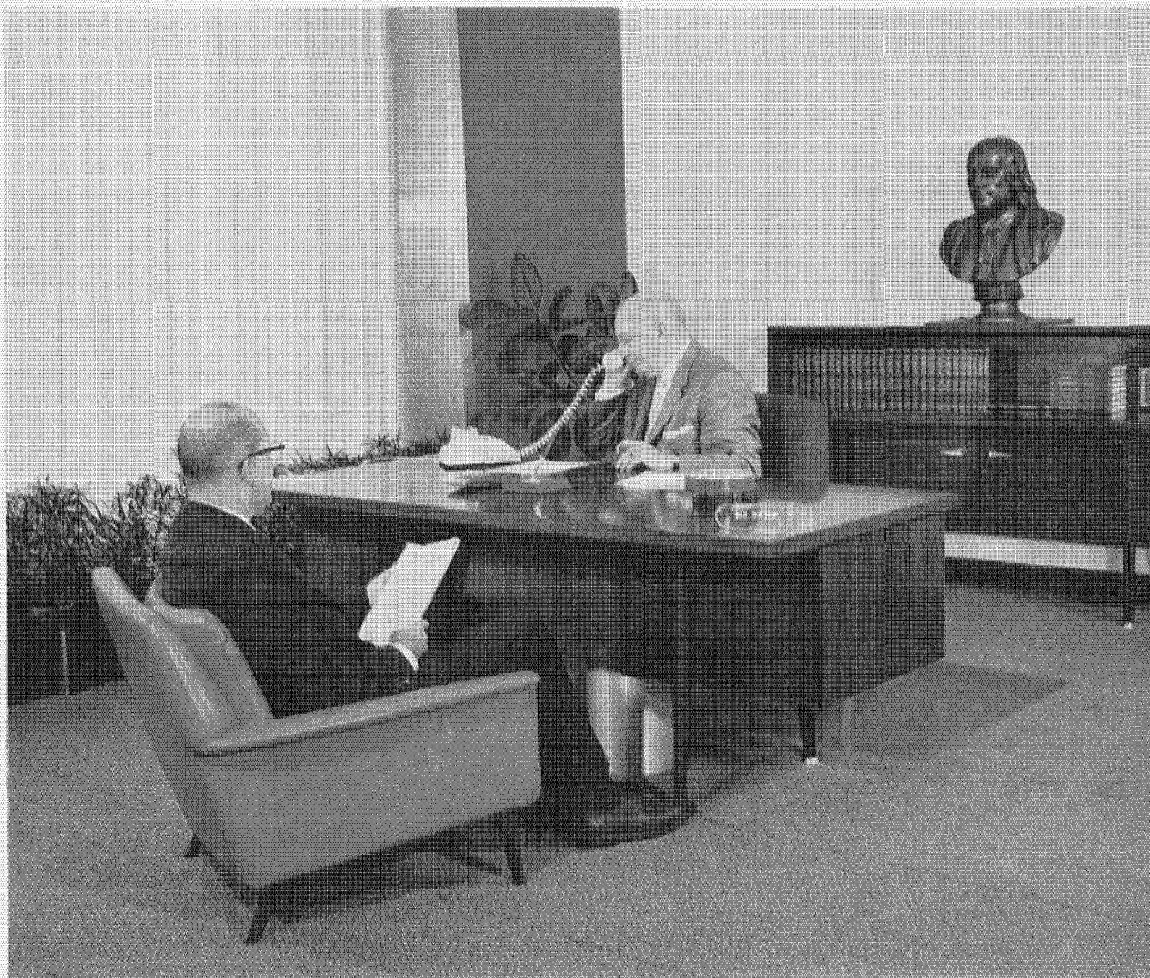
Though styles in executive office furniture change, both Herman Miller and Leopold continue to use Du Pont "Dulux" finishes as they have for years. "Dulux" gives a soft glow that adds to the beauty of walnut and other fine furniture woods, and also offers lasting protection. The modern desk doesn't suffer from spilled coffee, for instance, as the roll-top would have.

Leopold feels strongly about the necessity of a superior finish for its furniture. Says Robert Fleming, "It must be flexible and, at the same time, durable and uniform. It also must have progress possibilities—that is, it must

OFFICE

for visitors and residents alike

By EMILY HEINE



Like cars, modern desks are lower than their ancestors. President William Dwyer's at Franklin Society Federal, New York City, above, is by the Leopold Co. L-shaped desk designed by George Nelson for Herman Miller is choice of Kelly-Smith Co. for its new offices, below. Du Pont "Dulux" finishes are used on both.

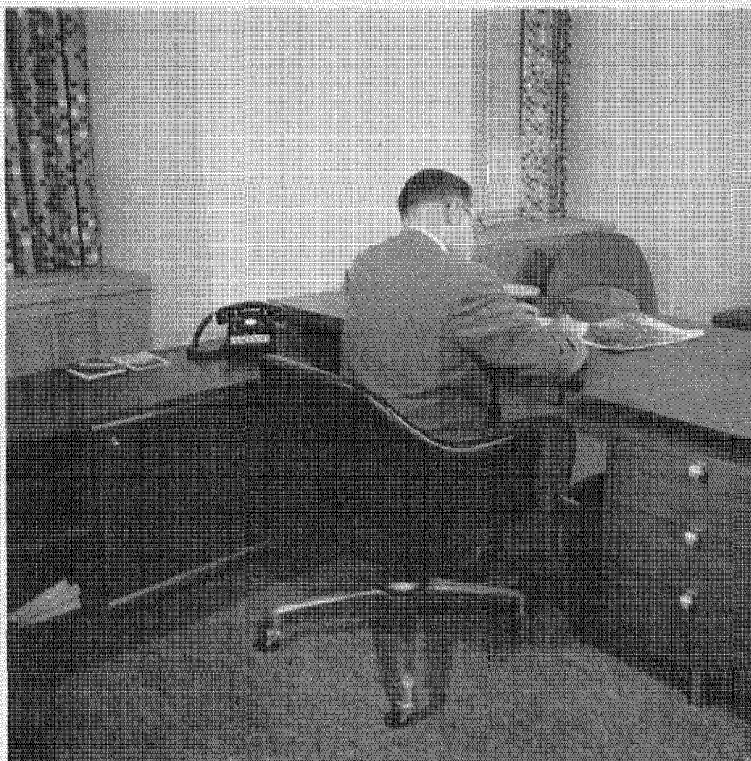
undergo research and development that will invite future improvements. This is one of the benefits we gain from our choice of Du Pont as a finishes supplier."

One recent Leopold installation in New York City, for instance, called for a delicate matching job by the finisher so that the Franklin Society Federal Savings & Loan Association's new desks would blend perfectly with some older walnut paneling used around the tellers' cages.

The desks are part of Leopold's new Document Group, designed by Charles U. Deaton, which also includes bookcases, chairs and tables. Desk designs are off-the-floor for a lighter look and are somewhat lower than older styles.

Banks and savings institutions were among the first to realize the public relations value of well-appointed executive offices. At Franklin Society and elsewhere a vice president is as accessible as a teller—perhaps more so, since he's not in a cage and there's a comfortable chair for the caller to sit in.

No matter what direction executive furniture styles take next, one thing is certain: More office equipment is bound to be needed in the future. While employment climbed 18 per cent during the past decade, reports the Wood Office Furniture Institute, there are 30 per cent more of us sitting at desks. With understandable pleasure, the Institute predicts a continuing upward climb.



THE BAKER AND

DuPont's K-cellophane solves a baker's distribution problem on the plains of the Texas Panhandle

Even for Texas, the Baldrige Bakery of Lubbock has done things in a big way. Established in the rear room of a grocery store back in the '20s, the firm now occupies a modern plant of 74,000 square feet and is just winding up a \$250,000 expansion program. Up to 70,000 loaves of bread—plus countless other varieties of Baldrige baked foods—are shipped daily by truck to retailers in 35 counties of West Texas.

When you cover a territory about equal in size to South Carolina from a single plant, general manager Raymond Burford told us, packaging assumes major importance. Stale bread costs a baker money, and so do wilted packages that customers shy away from buying. The answer for Baldrige has been a polymer-coated film which Du Pont calls "K-cellophane." The big advantage of the coating is that it resists the deteriorating effect of fats in baked foods. K-cellophane has increased the shelf life of his products, Burford says, and has boosted sales because the transparent film stays clear and unwrinkled. As a matter of fact, he now uses it on almost all of the bakery's products.

At Baldrige, 450-gauge K-cellophane is the rule for fruit cakes and for bread that is shipped to the farthest points and gets the most handling. Thinner 300-gauge film goes on less-traveled white bread and on cakes,

rolls and buns. Because fruit cakes are generally on the shelf longer, the heavier K-cellophane is "the best thing yet for protection," we were told by Cecil Ray, Baldrige's wrapping foreman.

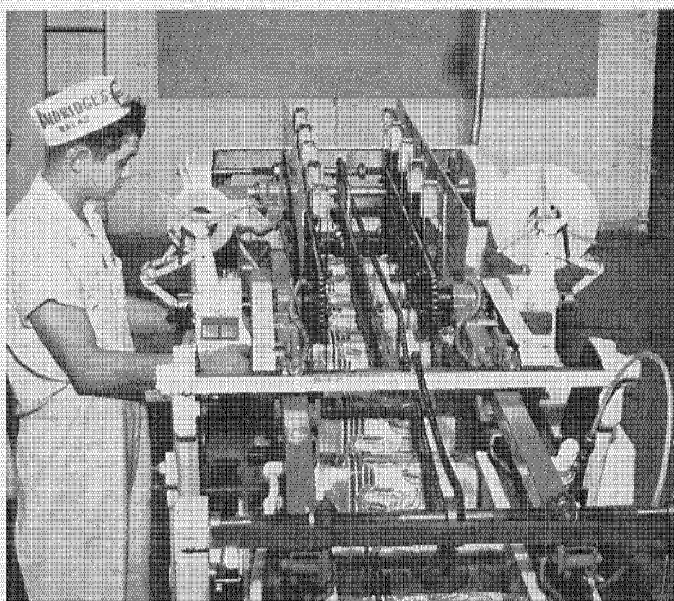
Burford was the one who led Baldrige to this newest kind of cellophane. "It was at the Baking Industry Exposition in Atlantic City in 1955," he recalled. "There were thousands of loaves in the Du Pont display, but this one-pound whole wheat loaf caught my eye. It looked as though it had just been wrapped—most impressive. A Du Pont salesman told me it was K-film. We began experimenting with it back home and started using it regularly soon afterward."

The Burford eye, incidentally, has been sharpened by 35 years with the Baldrige firm. A nephew of founder Joe Baldrige, he began work at the store as a boy crating eggs. He got into the bakery business full-time as a route salesman in 1928 and has been general manager since 1941. Baldrige's widow and sons Joe E. and J. Don also are active officers in the firm. Joe E., for example, boxed his first bread at the age of eight and later was helper on a route. Now 36 and vice president of the company, he directed the recent expansion and modernization program.

"Bread is life," says the framed slogan that greets you as you walk into the Baldrige plant. Bread has indeed meant a good life for the Baldrige family and for the more than 200 employees who share in the success of their Texas bakery.



K-cellophane, because it looks better on the shelf, has boosted Baldrige sales, general manager Raymond Burford tells writer.



Baldrige wraps up to 70,000 loaves of bread daily. Business started in back room of the family grocery store 35 years ago.

THE CANDYMAKER

The same transparent film helps a New York confectioner go after supermarket business

Biting into the sweet new candy business offered by supermarkets is the goal of a major merchandising switch on the part of W. F. Schrafft & Sons Corp., Boston, and Wallace & Co., a Brooklyn candymaker since 1870. Before World War II, food stores sold Americans only a small fraction of their candy; now food outlets account for 35 per cent of a total sale of sweets that exceeds a billion dollars annually.

"We feel there's a definite place for quality candy in take-home as well as gift packages," explains Herbert Bebar, Wallace's energetic young president. "We began producing a line of ten-cent bagged candy a little over a year ago and this fall added a 29-cent line." The bagged candy, now available only in the East, eventually is scheduled for national distribution. Meanwhile, Wallace is continuing to package candy in boxes for Schrafft stores along the East Coast.

Adding a make-and-fill line that would run slick and fast called for some fancy machine adaption on the part of E. A. Terry, Wallace's vice president in charge of production. To get the necessary speed, he hooked up five electronic scales to one wrapping machine. It can turn out 60 finished bags a minute and about 26,000 a day.

A key to the smooth running lies in Du Pont's polymer-coated K-cellophane. Wallace uses 450-gauge K

for the ten-cent bags and two layers of thinner 300-gauge film for the 29-cent size. The 300-gauge film is a high yield material—19,500 square inches to the pound—and in double-wall bags it offers superior durability as well as the excellent flavor retention and moisture protection characteristic of K-cellophane. Candymakers got their first look at the 300-gauge film only last spring.

"We're sold on visible packaging," says Herbert Bebar. "We think our candy itself has more appetite appeal than any printed picture, no matter how good."

He and Terry experimented with a number of visible packaging materials, however, before settling on K-cellophane. Describing this quest the other day, he passed around samples of bagged candy. "Notice how crinkly and brittle this one is," he said. "In contrast, bags made of K-cellophane have a luxurious feel—like stroking a mink coat or a Persian cat."

Wallace expects its supermarket customers to do more than stroke the packages. "Candy really gets shoved around in a supermarket," Bebar says. "We need the durability that double-wall K-cellophane gives us."

Bebar and Terry feel that the exceptional clarity of K film gives their candy an extra sparkle. "We put a special crystal sugar finish on many of our jellies and gums, and the different planes of the sugar crystals refract light—like diamonds, you know. The K film shows off this brilliance, protects the candy and insures a long shelf life. What more could we ask?"



"K-cellophane helped get our supermarket candy sales off to the best possible start," says Wallace's president Herbert Bebar.



Using cellophane from two rolls—one plain film and the other printed—this machine makes and fills candy bags automatically.



American Velcro officials Ralph Hood and Larry Girard, outside busy plant, sport symbolic cocklebur corsages.

Cockleburs by the yard

MANCHESTER, N. H.

Ralph Hood and Larry Girard are as entangled with cockleburs as a spaniel's ears, and they love it. They're president and plant manager, respectively, of American Velcro, Inc., maker of the "zipperless zipper" that's caught the fancy of America almost overnight.

It's already closing coats, jackets, shoes, skirts, trousers, belts, hats and handbags. It's moving so fast that nobody, including Hood and Girard, can tell you all the applications it has found.

The "Velcro" closure is, literally, a man-made cocklebur with an ideal catching-place to match. Its Swiss inventor noticed the tenacious grip some cockleburs got on his clothing during a hike and ingeniously put the principle to work. Luckily, the materials that finally made it possible for the cocklebur to become a friend of man were available—synthetic, thermoplastic fibers. All of American Velcro's closures are made of Du Pont nylon fiber and nylon filament.

Here's how they work: One nylon fabric strip bristles with close-packed filaments—500 to 600 per square inch—tipped with tiny, permanent hooks. The matching strip is covered with soft loops of nylon multifilament yarn. Press them together and they cling tightly, hooks grasping loops. Peel them apart and they separate easily as the springy hooks progressively lose their grip. Press the strips together again—or as many as 25,000 times, according to the maker—and they clasp each other just as securely as before.

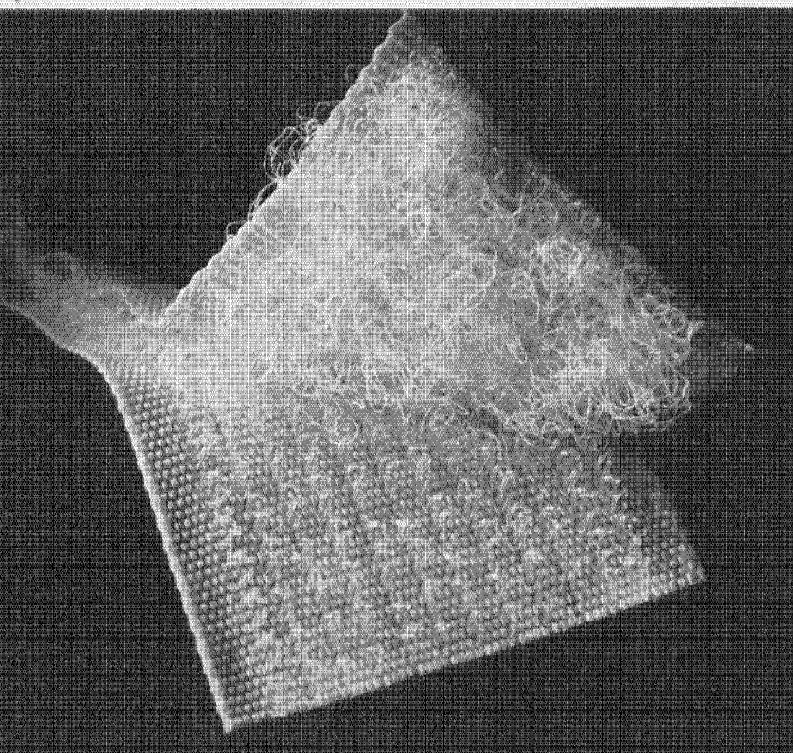
The closure is washable, dry cleanable, jam-proof and won't corrode. Everyone who's heard of the "Velcro" since production started here last summer seems to want to buy it, sell it, invest in it or experiment with it, says Hood, who also is president of Velok, Ltd., the Canadian parent company. Thousands of letters have flooded the new sales office in New York, piling up by the bushel despite the efforts of five girls to acknowledge them.

Hood and Girard can't keep samples on hand at the plant they've opened here beside the Merrimack River—they go right to the end of the production line to get them. The visitor walks away with his sample, invariably thinking of new ways to use it. People want to put the closures on brief cases, diaper bags, spectacle cases, slip covers, beer cases and dozens of other items.

Despite 24 specially made looms working three shifts and 28 more ready to be installed, American Velcro can't begin to keep up with orders. Although weekly output amounts to several miles of "Velcro", stock shelves are cleared by each day's end. Training new workers and smoothing out the process have kept the management team on the go up to 16 hours a day, but there haven't been any complaints.

"We just wish we could furnish everybody with all the nylon cockleburs they want," said Hood, reaching to answer the phone.

Wonder how one of these would work on a bulletin board . . . ?



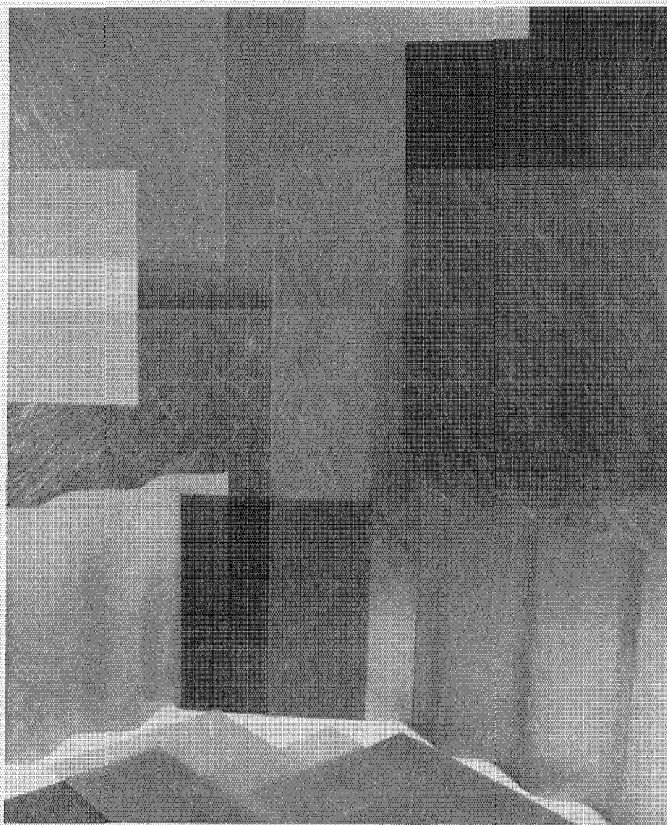
Shown here more than three times actual size, closure works when tiny hooks, below, clasp loops of nylon.



"Zipperless zipper" is being used on variety of garments, is seen as boon for both adults and children.

IT'S NEW

• **"STREN"** monofilament spinning line, available in early 1959, is 20 per cent stronger and has one-third less stretch than standard monofilament. The new Du Pont line, for fresh or salt water fishing, will be furnished on regular 100-yard spools and in a special package for closed-face spinning reels in sizes from 4- to 30-pound test. Line's gunmetal color makes for low visibility.

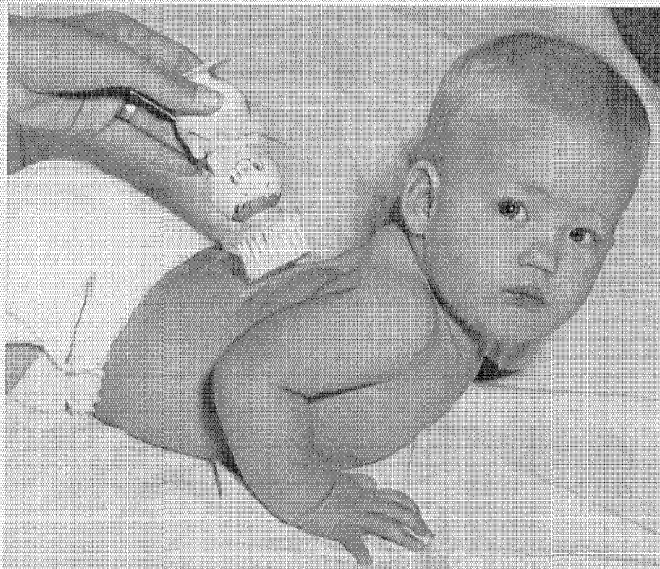


• **"LUCITE" ACRYLIC SIRUP**, new liquid form of Du Pont's well-known plastic resin, is being molded into glass-reinforced panels that resist weather, impact and abrasion for such uses as patio roofs, truck-trailer skylights, awnings, industrial glazing, billboard trim and lighting fixtures. Panels are offered in a variety of colors and decorative patterns by U. S. Rubber Co., 1230 Avenue of the Americas, New York City.

• **AIRCRAFT REFUELING HOSE** with reinforcement of "Dacron" polyester fiber covered with Du Pont neoprene is stronger and weighs less than previous types, reports the Quaker Rubber Division of H. K. Porter Co., Inc., Philadelphia. Hose also has excellent resistance to oil, rot, mildew and weather, Quaker says.



• **TRIM CUSHIONS** of urethane foam upholster new Danish Casual furniture being introduced by the Heywood-Wakefield Co., 206 Central St., Gardner, Mass. The resilient foam, known for its seating comfort, shape retention and light weight, now is offered in all the company's upholstered furniture lines. Du Pont "Hylene" organic isocyanates are key ingredient of urethane foam.

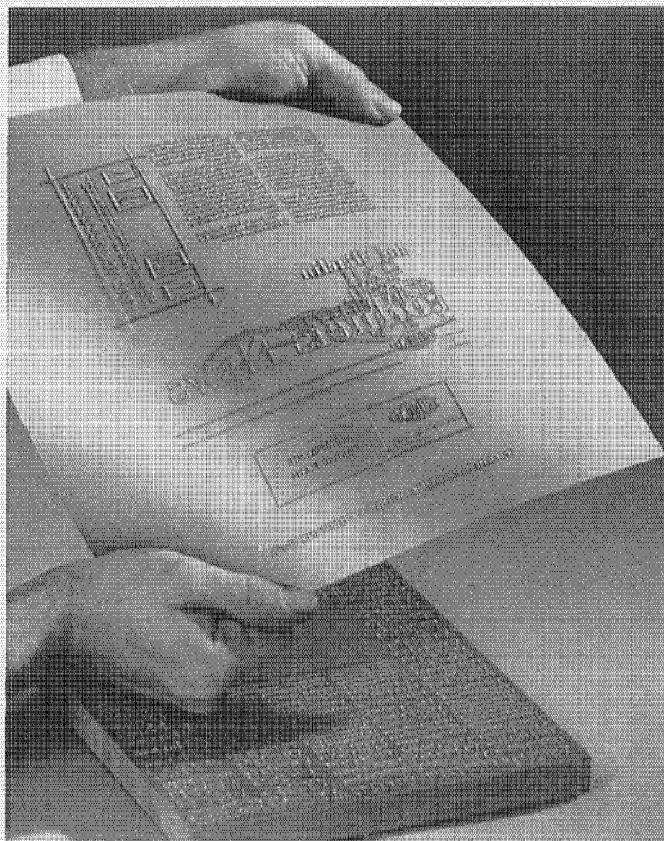


• **"SWEET AND CLEAN"** baby powder brush dispenses talcum through soft "Tynex" nylon filaments. Brush can be removed for easy washing, and hand-decorated body is refillable. Marketer is Richard G. Krueger, Inc., 112 West 34th St., New York 1, N. Y.

- **NEW THERMAL INSULATOR**, fibrous potassium titanate, is twice as effective as any known insulating material at temperatures from 1,300° to 2,100°F., reports Du Pont's Pigments Dept. It's composed of tiny crystalline fibers that scatter infrared rays.

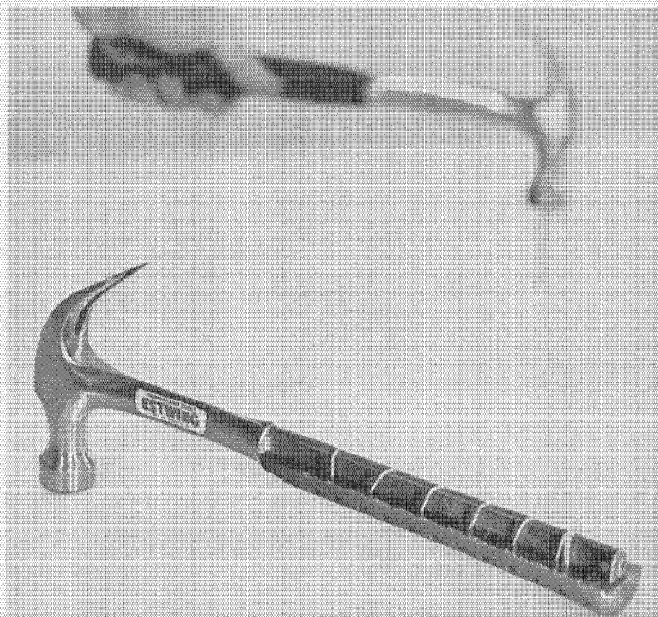
- **LIQUID SUSPENSION** of thiram, a potent fungicide, is available in Du Pont's new "Arasan" 42-S seed disinfectant and protectant. Liquid form offers major advantages for seed treaters. Product also can be sprayed on plants and young trees to repel animals and birds.

- **LEAKING SEAMS** in metal trailer tops are sealed by applying a neoprene-coated nylon tape over a cushioning strip of urethane foam. Materials, including adhesive, are marketed in a Nylo-Flex kit by Haartz-Mason, Inc., 270 Pleasant St., Watertown, Mass. The combination's elastic properties resist cracking or tearing of the tape due to trailer's motion.



- **PHOTOSENSITIVE PLASTIC PRINTING PLATE** has performed successfully in field tests at six types of letterpress printing plants, Du Pont's Photo Products Dept. reports. More than 2,000 printers at first public demonstration saw the photopolymer plate exposed to ultraviolet light through a high-contrast photographic negative, then "washed out," mounted and run on a press in less than 20 minutes. The department says no date has been set for the plate's commercial debut.

- **SWATCH ALBUM** of "Fabrilit" vinyl coated fabric can be obtained by interior decorators at cost price, \$8.25, by writing Du Pont Fabrics Division, N-2537-DM, Wilmington 98, Del. Ring-bound album allows easy removal of swatches. Samples of new patterns will be mailed free to album owners.



- **CUSHIONED GRIP** of new hammer (cutaway above) uses Du Pont nylon cord as internal reinforcement for soft vinyl plastic molded around steel handle. Estwing Mfg. Co., Rockford, Ill., developed product after study of nylon cord performance in tires. Estwing's tests indicate grip will outlast the hammer head.



- **NEW SWIVEL SEATS** in 1959 cars of Chrysler Corp. use parts of Du Pont "Zytel" nylon resin for quiet, maintenance-free operation. Seats turn easily through 40-degree arc on flat pivot bearings and twin rollers of "Zytel" that require no lubrication. Tough discs of the plastic at sides protect trim. Seats have new contour design and are said to be as strong as conventional ones.

If they don't have what you want at DuPont's Fairfield

plant, just ask for it. Chances are you can get a fabric . . .

COATED AS YOU LIKE IT

By KARL WERLINE

FAIRFIELD, CONN.

The customer wanted a special synthetic rubber coating. Could he have it on a silk fabric base?

"If you need it to meet your specs," answered the coated fabrics expert. "We're prepared to coat any material you say."

"How about cobwebs?" asked the customer slyly.

"Sure," was the confident rejoinder, "if you furnish us with the fabric."

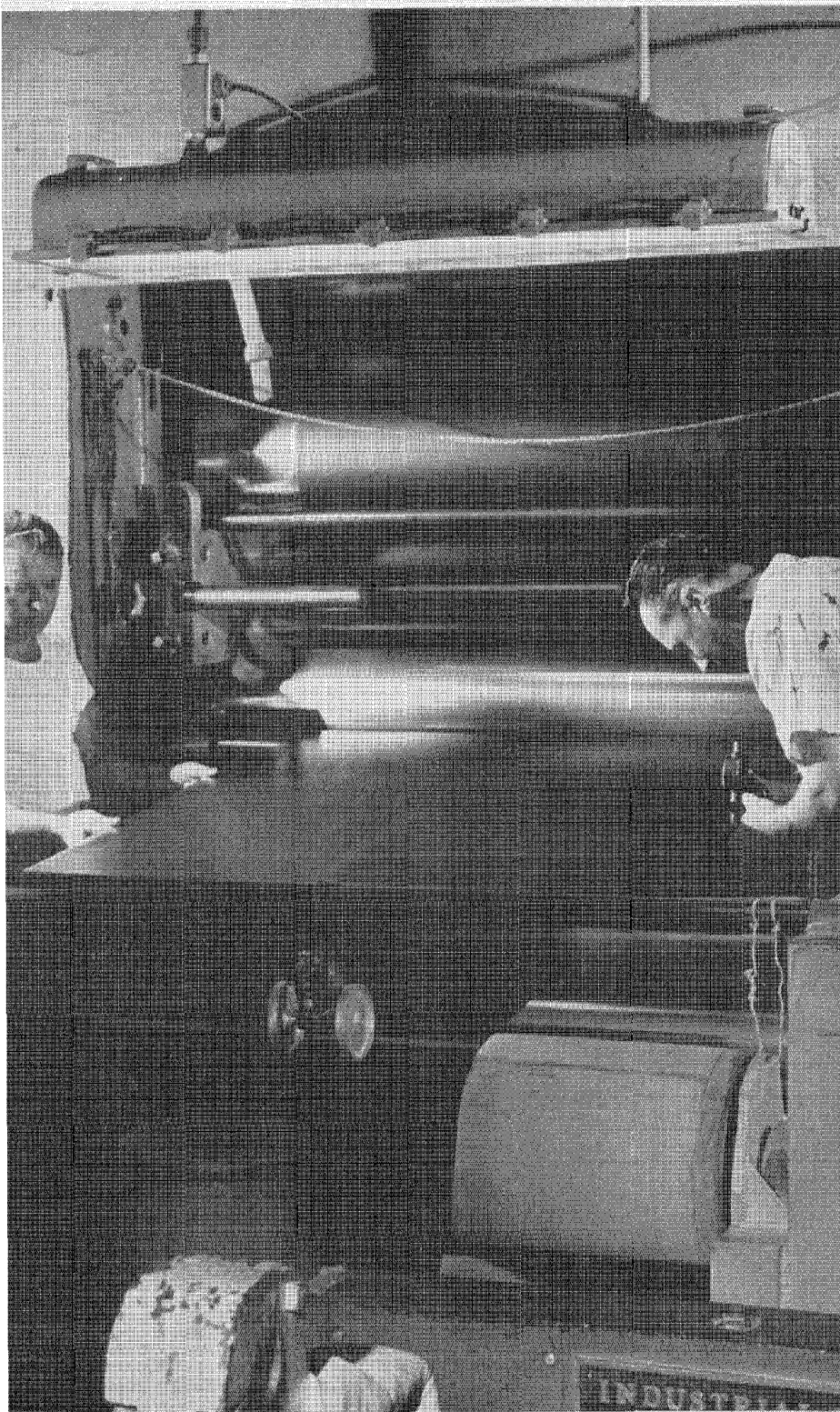
Cobwebs, as a matter of fact, are not far beyond some of the demands made on development men at Du Pont's Fairfield plant. A hundred special formulations of synthetic rubber coatings have been developed here for as many different fabrics and weaves. And because industry's requirements are becoming stricter and more diverse, new combinations are invented yearly for uses ranging from air-supported shelters and tarpaulins to protective clothing and pump diaphragms. Today, industry is finding, a coated fabric often means the difference between trouble and smooth sailing.

Take the case of the manufacturer who successfully modified one of his jet engines to improve its power. Trouble was, it would run smoothly for only a short time. The gremlin: a few square inches of coated fabric in the fuel metering system. This fuel-air diaphragm had never broken down before, but the newer, more powerful electrical components of the engine generated large amounts of ozone which ruined it in minutes. Called on for help, Fairfield soon came up with a "Fairprene" synthetic rubber coated fabric not only resistant to ozone but to all the fuels such an engine might burn.

A few years ago, the engine manufacturer wouldn't have found a solution so readily; there were only about five kinds of rubber to work with. Each had special characteristics, but none had the combination of outstanding properties needed to resist several degrading influences at once. Now the chemist has more than a dozen elastomers in his bag of tricks.

The newest arrival at Fairfield is Du Pont "Viton" synthetic rubber. Compared with one of the earlier elastomers, the price per pound for "Viton" is startling—but so are the additional tasks it can do.

To get desired thickness, coatings are applied to base fabric either as a sheet or in heavy liquid form. Here machine calenders a sheet onto fabric.



A helicopter manufacturer, for example, uses fabric coated with "Viton" in molding bags. They must withstand corrosive hydraulic fluid at 425°F. and 90 pounds pressure. No other coated fabric will resist the oil, let alone the heat and pressure.

Other fabrics coated with "Viton" are going into protective clothing, fuel pump diaphragms, seals, and hoods for acid fumes. To get the most out of the rubber's resistance to high temperature, abrasion and chemicals, chemically tough fabrics of "Teflon" TFE-fluorocarbon fiber often are used as the base. This hikes the price, but the worker who wears a garment of the fabric to fuel a missile with red fuming nitric acid is getting the best protection yet devised.

During the past couple of years Fairfield has worked out several coating compounds using "Hypalon" synthetic rubber. This elastomer is noted especially for its topnotch weather, ozone and abrasion resistance. Fabrics coated with it were used first in tarpaulins for trucks and ships. Last year Fairfield developed a similar fabric for inflatable buildings that will weather two to five times longer than those using other coatings. One company, banking on the abrasion resistance of "Hypalon", made a five-story-high pneumatic bag that was used to raise an aluminum dome in Kansas. Since the coating of "Hypalon" can be supplied in a variety of lightfast colors, many outdoor uses suggest themselves for exploration.

OLDSTERS STILL ACTIVE

These examples don't mean that the older elastomers are passé. On the contrary, new developments give them a firmer place than ever in the coated fabrics field.

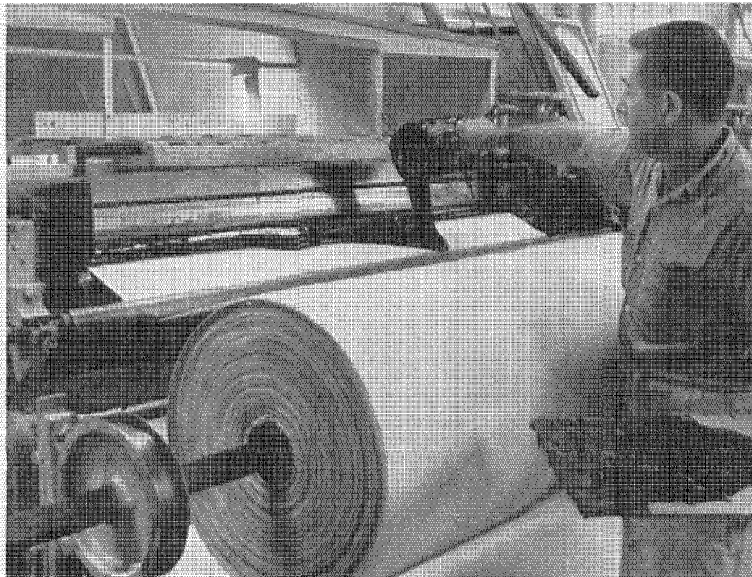
For example, the Fairfield chemist can take neoprene, the first synthetic rubber used for coatings, and adjust its properties to fit precise specifications. With carbon black, he can vary its abrasion resistance, strength and stiffness. Certain plasticizers reduce hardness and improve low-temperature properties. Antioxidants combat the aging caused by weather and heat, and curing agents change the elastomer's workability. This chemistry isn't limited to neoprene; other rubbers can be compounded to order, too.

Choice of fabrics gives the chemist additional latitude. He still uses cotton for the easier jobs, but when the going gets rough he turns to nylon, "Teflon", "Dacron" polyester fiber or glass fiber. Thus the combination—coating and fabric—can be tailored to fit specific needs.

The surge of new materials in the last ten years has made the fabrics business bewilderingly complex. If it moves forward as rapidly in the next ten, chemists here may get the chance to prove what they know about coating woven cobwebs after all.

Meanwhile, if you have a job that calls for a coated fabric and can't find exactly what you're looking for, get in touch with Robert J. Burger, Industrial Product Sales at Fairfield. He'll have his men look for a combination of textile and elastomer to do your job.

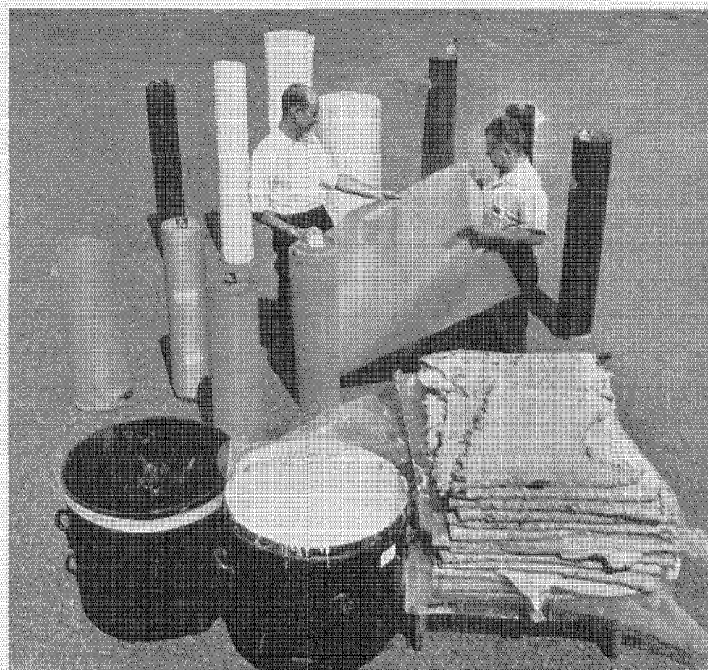
A coated fabric is developed to fit specific needs by tailoring a coating from one of a dozen elastomers, foreground, then selecting the right fabric.



Here's how a coating only thousandths of an inch thick is applied to fabric. It may be built up in as many as eight passes through machine.



Coatings with special properties are made by milling such materials as carbon black and plasticizers into elastomers.





TO: CHEMISTS, R & D

This new feature is written especially for research and development personnel among our industrial readers.

New route to rigid vinyl

The making of rigid, unplasticized polyvinyl chloride products by calendering, pressure molding or extrusion is familiar to almost everyone in the plastics industry. Now, thanks to formulations based on pyromellitic dianhydride (PMDA) and an epoxidized plasticizer, it's possible to start with easily pourable fluid plastisols, fuse them under the usual conditions for PVC, and end up with rigid products. PVC plastisols containing PMDA can be cast, sprayed or applied by dip coating. The final products can be given a broad range of physical properties simply by varying the ratio of ingredients.

The coatings have good adhesion to metals, glass and some plastics, even without a primer, and the castings retain their strength at elevated temperatures better than rigid, unplasticized PVC. Another promising application for PMDA: in glass-reinforced laminates that retain considerable strength even at 300°F.

PMDA is also a potential epoxy curing agent for high-temperature castings and laminates. Heat distortion temperatures as high as 500°F., for example, are easily obtainable. Its poly-functionality and heat stability also suit it for the synthesis of new pigments, plasticizers, high-temperature esterlubes and resins. If you're interested in chemical building blocks, here's one that should fit into any number of construction schemes.

DMF a catalyst, too

In its brief eight years of commercial use, dimethyl formamide has won general recognition as about the closest thing there is to an all-purpose solvent. Recently it has won notice as a chemical reaction medium, too, thanks not only to this unusual solvent power but also to its catalytic effect on many chemical reactions.

DMF is highly polar. Consequently it can influence bond-breaking and bond-forming processes and convert molecules into reactive forms by solvation and its high dielectric effect. In many cases it may be used to shift the equilibrium in the direction of better yields, better conversions, a purer product. It may also increase reaction velocity, although this catalytic effect is often obscured because, as the reaction medium, DMF is present in more than catalytic amounts.

Favorably influenced by DMF are substitution, addition, elimination, and coupling reactions involving organic and inorganic halides. A simple new synthesis of primary and secondary nitroparaffins, for instance, is based on the reaction of alkyl halides and sodium nitrite in DMF.

Cyclization, polymerization and reactions involving cellulose are among those carried out in shorter times, with better yields and often under milder conditions, using Du Pont's DMF as the medium.

Call it ferrocene

Searching for a reducing agent with unusual thermal stability? A compound that resists pyrolysis at 470°C.? A source of covalently bound iron? You'll find all of them in Du Pont's organo-metallic compound, dicyclopentadienyliron. Call it ferrocene, if you like, and we'll know what you mean. Its aromatic character, unusual stability and high iron content, along with a marked solubility and volatility, suggest it for these and other applications.

In acid media, ferrocene readily reduces copper^{II} to copper^I, nitro groups to amino groups, and anthraquinone to anthrone. In the process it is itself oxidized to a blue, water-soluble cation containing trivalent iron.

This susceptibility to oxidation is the biggest single difference between ferrocene and a classic aromatic system. In all other respects it is aromatic in character, readily undergoing Friedel-Crafts reactions, sulfonation, condensation with aldehydes and, in the oxidized form, arylation with diazotized aromatic amines. Preparation of the mono-substituted amino and vinyl derivatives (the latter is readily polymerized) are other examples of how this unique organo-metallic compound may be adapted to classical methods of organic chemistry with only slight modification.

For further information on above products, availability of samples, etc., write the Editor, Du Pont Magazine, Wilmington 98, Del., giving as much detail as possible about the application you have in mind.

CUSTOM-TAILORED AIR CONDITIONING

... that's what the Dallas Home
Furnishings Mart gives its tenants with
a flexible system of 222 package
units charged with Du Pont "Freon"

Air conditioning is almost as much at home in Texas as tall hats and long talk. But how do you air condition a building efficiently when its 434,000 square-foot sales and display area is split among tenants with quite different cooling requirements?

The Dallas Home Furnishings Mart faced this problem, further complicated by the fact that much of the building is seldom open—twice a year for a week at a stretch when manufacturers show new lines, plus two days a month when buyers shop and place orders. Only a few offices are open the rest of the time.

With maximum flexibility called for, a system of package air conditioning units—222 of them—was proposed and installed. The resulting 1,200-ton system is said to be the world's largest single installation of horizontal package units for cooling and heating.

Each unit was charged with Du Pont "Freon-22" refrigerant for maximum safety and efficiency. Result: Temperatures stay where they ought to and there hasn't been a single leak or mechanical failure.

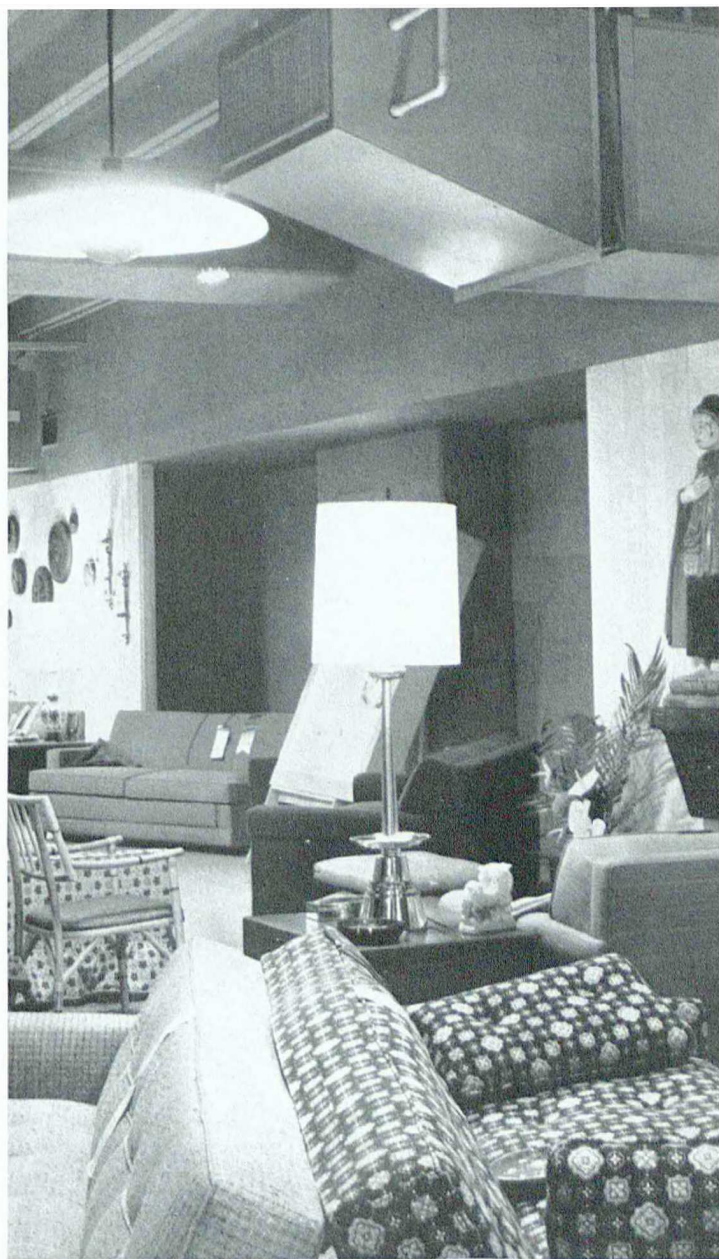
You, too, can ask suppliers of air conditioning equipment to fit a flexible system to your company's precise needs. And to help assure the same trouble-free performance, be sure to specify Du Pont "Freon" refrigerants on every order.



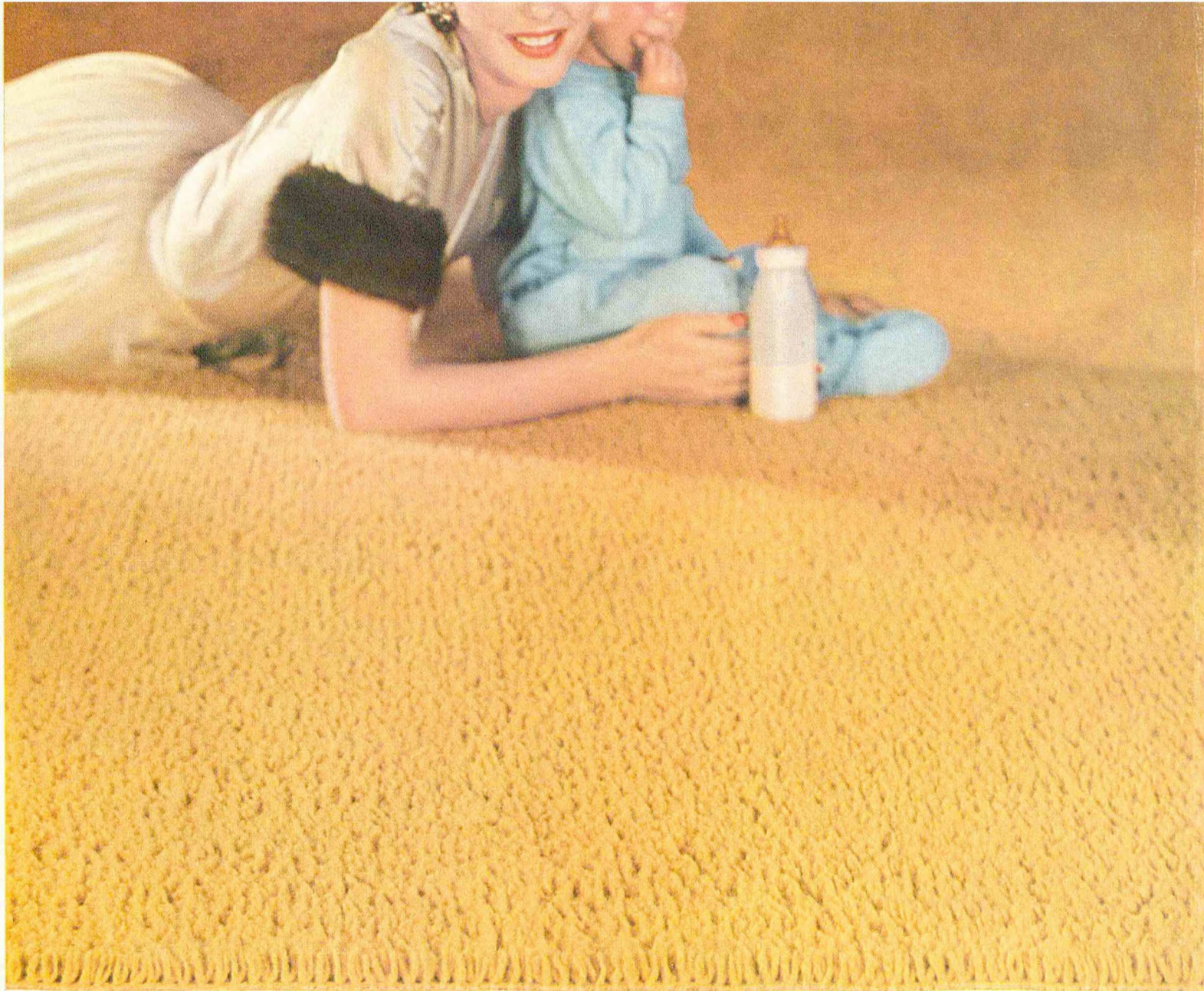
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

FREON® REFRIGERANTS

"Freon" and combinations of "Freon-" or "F-" followed by numerals are Du Pont's registered trademarks for its fluorinated hydrocarbon refrigerants.



Each exhibit area in windowless Dallas Home Furnishings Mart has at least one individually controlled air conditioning unit. For heating, hot water is piped to each. Ceiling mounts save valuable floor space.



Du Pont makes fibers, not the fabrics or carpet shown here.

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Discover for yourself the beauty, richness and economy of Du Pont Carpet Nylon— in luxury carpeting that takes so little care . . . gives longer wear. Feel the deep-down lasting texture . . . see the glowing decorator colors . . . picture its enduring elegance in your home! Write for free booklet:

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BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



Next Du Pont Show of the Month—"The Hasty Heart"

9:30-11 p.m. EST, Thursday, December 18 on CBS-TV