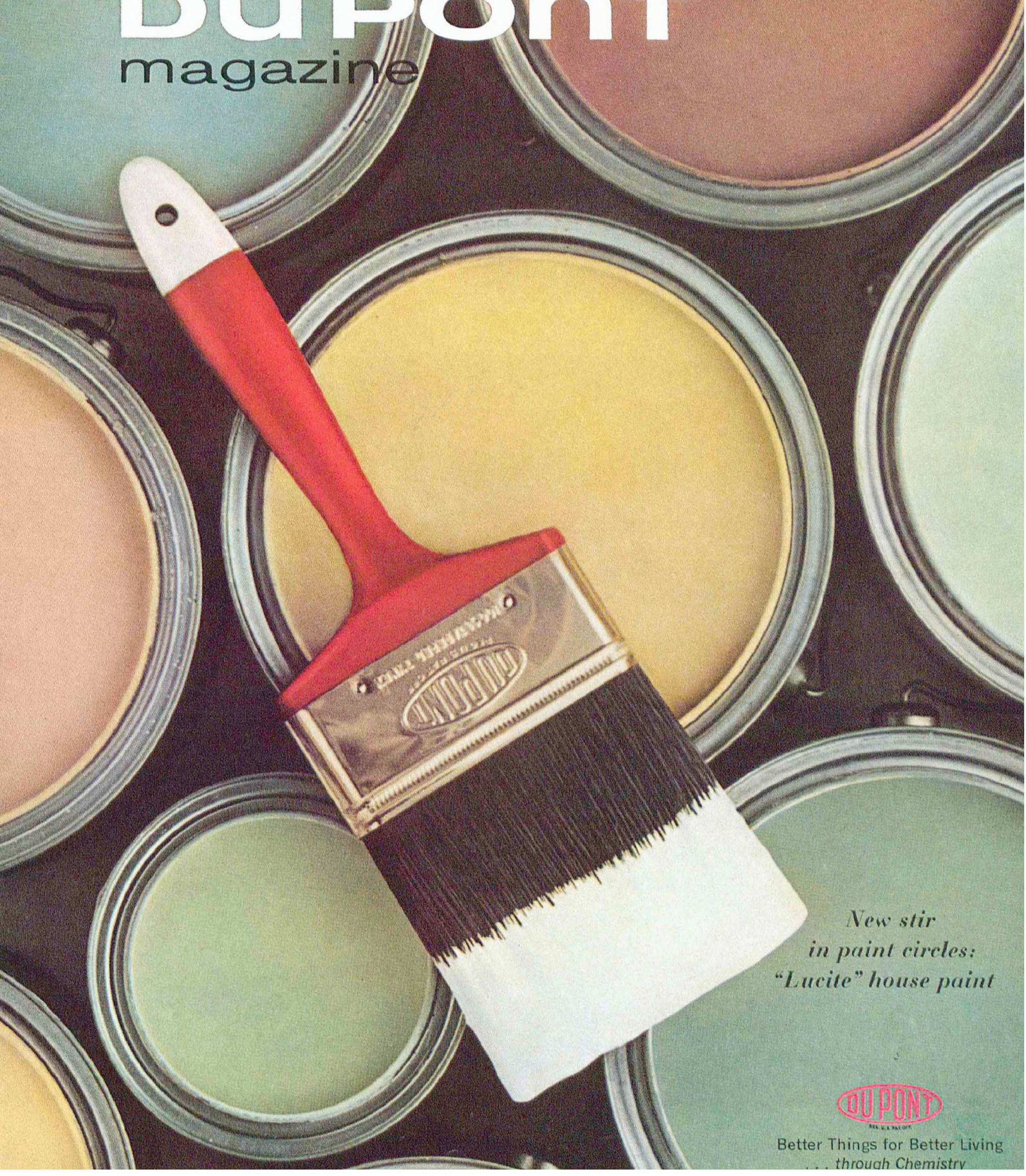
# DuPont magazine




*New stir*
*in paint circles:*
*"Lucite" house paint*

DUPONT

Better Things for Better Living
. . . through Chemistry

*TD Nickel now offers aid to engineers in the form of*

# New High-Temperature Shee

Necessarily moving swiftly, the research technician, below, uses tongs to reach into a furnace hot enough to change commonly used superalloys to shapeless blobs. But the rectangular piece of metal he nimbly extracts is undamaged, and its many mechanical properties are virtually unchanged.

The heat-resisting material is TD Nickel sheet, the first commercially available sheet dispersion strengthened to perform in temperatures from 1800°F. to 2400°F. It is an extension of Du Pont's development a year ago of high-temperature-resistant bar stock (*Du Pont Magazine,* July-August 1962). The addition of TD Nickel sheet to bar stock closes still tighter the metallurgical gap between the superalloys, such as nickel- and cobalt-base products, and the exotic refractory metals.

The sheet is available in gages from .010 inch through .187 inch, widths up to 24 inches and lengths to 36 inches. Foil gages can be produced on special order.

"TD Nickel sheet is made on the same principle as our bar stock, but is an even more significant metallurgical development," says H. F. Peters, Du Pont Metal Products marketing manager. "By successfully making sheet, we confirmed that our process has flexibility and adaptability and is not limited to producing bar or other simple shapes. Moreover, test findings indicate that the sheet, strengthened with a dispersed second phase, may be the key to a new range of high-temperature equipment in jet engines, trans-sonic and supersonic aircraft components and aerospace hardware. It should also solve some high-temperature problems in the refining, chemical, nuclear, metals and electronics industries."

Like bar stock, sheet is produced with a second phase dispersion of ultrafine (.000001 inch in diameter) particles of thoria. An extremely stable oxide, thoria is completely and uniformly spread within a matrix of pure nickel at the ratio of 2 per cent volume thoria to 98 per cent nickel. The process is unique compared to traditional metal smelting because the alloy is achieved chemically and never reaches a molten state.

"Compared to superalloys, TD Nickel sheet has notable advantages in both high-temperature tensile strength and stress ture properties," says Peters. "For exa at its lowest operating range, 1800°F. sheet has a typical ultimate tensile str of 20,000 psi, which is competitive wit balt- and nickel-base superalloys. Its str is superior at higher temperatures, standing 4,000 psi at 2400°F. Unlike viously available materials, TD Nicke be cycled to its top range with little sacrifice in mechanical properties. An though there may be some overlap bet TD Nickel and refractory metals i 2200°F. to 2400°F. range, the new ma has the advantage of being considerabl expensive than the refractories."

Because the sheet is produced wit insoluble dispersion, it has almost the properties as its base metal (nickel) at temperature, according to Peters. Esse ly, it retains pure nickel's electrical thermal conductivity, density and sp heat properties. In addition, the thoria stantially improves the metal's oxidatio corrosion resistance. Corrosive testin proved the material is superior to



nickel when exposed to a wide range of environments, i.e., lead salts, organic acids, fuel ashes and mineral acids.

Particularly important is the fact that TD Nickel can be formed and machined with standard methods at room temperatures. The sheet can be joined by brazing and by diffusion bonding. Fusion welding techniques are being developed.

"Currently, TD Nickel sheet is about twice as expensive as the superalloys, but this is a temporary situation. Its price will become competitive as the volume and scale of demand begin to increase," explains Peters.

He and his colleagues expect the introduction of TD Nickel sheet to produce the same widespread interest as did the earlier form: bar stock. "Bar stock is already involved in about 150 different high-temperature equipment and component field evaluation programs," says Peters. "Chief among them are gas turbine components in which TD Nickel promises to effect a 200°F. to 400°F. increase in gas inlet temperatures. This would represent a major materials breakthrough. Other significant applications range from aerospace hardware to parts in elevated temperature furnaces."

TD Nickel bar stock also is being drawn into wire, for example, that can be woven into conveyor belts that are many times more durable than those made from conventional nickel-base alloys. The belting is being examined for such uses as continuous service in stainless steel sintering furnaces, where it is expected to reduce the problems of stretching, oxidation and embrittlement.

A rapidly growing interest is developing in TD Nickel bar stock for test grips and extension rods in elevated temperature tensile and mechanical property testing machines, says Peters. "With materials constantly improving and operating temperatures steadily increasing, there has been a real problem in finding holders and grips that can outlast the specimens in tests in the 2000°F. to 2400°F. range," he says. "TD Nickel machined into grips and holders appears tailor-made for this job."

Other forms under current evaluation are tubing and a whole range of studs, nuts and bolts made from bar stock, and offering both commercial and aerospace applications.

Like the new TD Nickel sheet, bar stock is produced at the Du Pont Metals Center in Baltimore. It is available in one-quarter-inch, three-quarter-inch, one-inch and 1¼-inch diameters. All bars can be made up to 20 feet long, annealed. A letter to the Editor, *Du Pont Magazine*, will bring complete technical data on both bar and sheet. ■

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# DU PONT magazine

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THE COVER. Opened cans of new "Lucite" house paint form a highly promising mosaic for the householder. Where once he needed an array of paints, primers and solvents to tackle the refinishing and touch-up of his home, the do-it-yourselfer can now do most of the work out of a single can of "Lucite". The paint, first introduced in 1960 for use over new or bare wood only, has now broadened its talents: it can be used over a variety of outside surfaces—masonry, composition siding, shingles, stucco, brick, concrete block and, of course, new or previously painted wood. For more on this development, see page 14.

Editor William C. Halley • Associate Editors Jack D. Hunter • Harry E. Davis

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*Many food processors were ready to depart; then new strains and plant armor plate like "Manzate" maneb fungicide yielded*

# New Jersey's Ripening Tomato Industry

By Harry E. Davis

In about a month, people in southern New Jersey will begin seeing red: all about them will be prolific fields of maturing tomatoes, the Garden State's vegetable king.

While growers are reluctant to predict a lucrative season, confidence is high. Yields have been consistently increasing, and last season's harvest shattered all records.

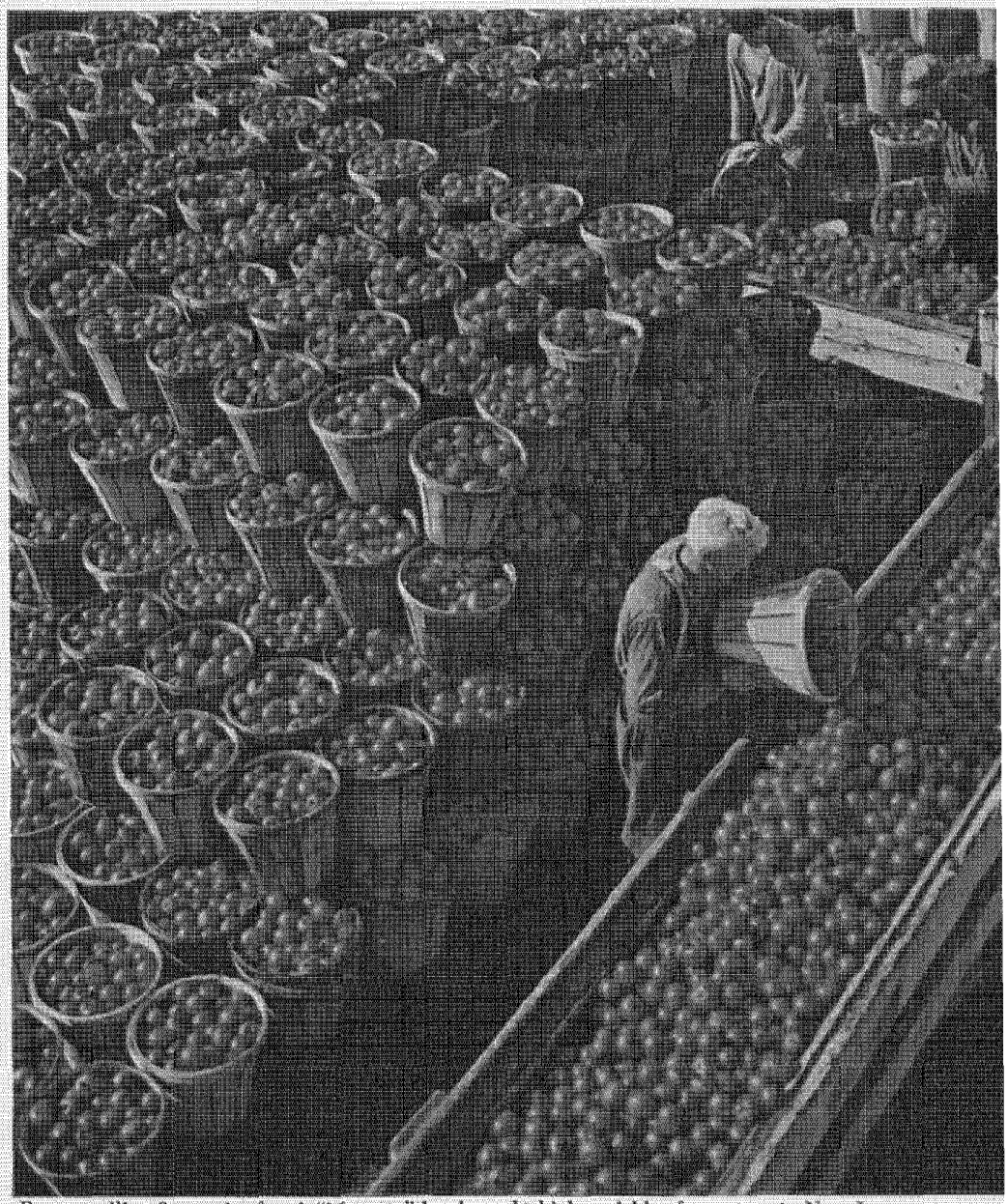
The 1962 yield for processing tomatoes, which account for most of the state's crop, was 375,200 tons. This is about 20 tons per acre, exceeding the national average by over three tons. Some 450 New Jersey growers surpassed the national mean; one farmer set an all-time individual yield of 38.05 tons per acre, and a crop of 30 tons per acre was reached by 22 growers, three times more than in 1961.

Taken at face value, 1962 yields are outstanding. They rate as wondrous, however, when one considers that not too many years ago the New Jersey tomato industry was in a deep state of depression.

"Back in the 1930's and 1940's process yields were running around three to five tons per acre, and six or seven tons were considered lucky," recalls W. Bradford Johnson, associate extension specialist of vegetable crops at New Jersey's College of Agriculture. "Processors could scarcely get enough ingredients for soups, sauces, juices and canned foods. And the tomatoes they did get were so poor that the companies were faced with higher costs for sorting and hand trimming. It seemed almost inevitable that the processing industry would have to abandon the East Coast and concentrate entirely in the Midwest and West."

New Jersey growers didn't have only one serious problem, but a half dozen. There were five major maladies of tomatoes—early and late blights, anthracnose and Septoria and gray leaf spots—plus the state's particularly rainy months of August and Septem-

*continued*



By controlling five major fungi, "Manzate" has brought higher yields of tomatoes to New Jersey.

# New Jersey's Ripening Tomato Industry

*continued*

ber. The warm, wet growing season, ideal for vigorous tomato plants, also provided a perfect environment for plant diseases to flourish. In addition, moisture caused cracking in tomato skins, reducing quality and increasing the vegetables' vulnerability to disease and fruit flies.

With tomato processing literally dying on the vine, all parties moved to counterattack. Armed with the potent weapon of research, they brought about two significant developments: new and heartier tomato strains and improved disease protection with plant armor such as "Manzate" maneb fungicide.

Prior to the 1940's most tomato research focused on the kinds and amounts of fertilizers that might deliver maximum yield. About the only fungicide in wide use was a group of "insoluble" coppers. These fungicides gave satisfactory protection against foliage diseases, but were ineffective against fruit fungi such as anthracnose, the small, round water-soaked spots that appear on ripe or nearly ripe tomatoes. As disease incidence increased, derivatives of dithiocarbamic acid such as the dimethyldithiocarbamate fungicides were developed, giving growers safeguards against anthracnose as well as foliage-attacking fungi.

Using the newly available fungicides to good advantage, growers in New Jersey and across the Delaware River in eastern Pennsylvania enjoyed yield increases of as much as 65 per cent.

But high spirits were short-lived. The signal of impending disaster sounded in 1946 when pathologists diagnosed the arrival of late blight, the same greenish-black rot that had caused the Potato Famine a hundred years earlier in Ireland. Without adequate control, severe outbreaks of the disease ravaged about 70 per cent of the East Coast tomato crop, and once firmly entrenched, reappeared in succeeding years. Again, the New Jersey tomato industry was plunged into depression.

For several years, the growers' only line of defense against late blight and other diseases was a complex and uncertain spray program. Growers had to guess which plant and fruit fungi were about to attack, and then alternately apply the numerous available fungicides in hopes of heading off the diseases. Each wrong guess, however, resulted in substantial crop losses. Meanwhile research scientists from universities, processing companies and Du Pont were expanding the tomato and fungicide families.

Help first came for New Jersey when Du Pont scientists made the manganese salt of the ethylenebisdithiocarbamate chain—a basic series in earlier nabam and zineb fungicides. The result of the new combination was maneb fungicide, dubbed "Manzate".

"Manzate" is a wettable powder, reac either to mix with water or to be used as dust. It adheres well to plants, protecti both foliage and fruits. Although develope for tomatoes, "Manzate" subsequent proved to offer excellent control of bo early and late blights on potatoes, and al became an effective fungicide for carro celery, cucumbers, lima beans, onions ar spinach.

## All-Purpose Agent

"The development of maneb fungici capped 20 years of tomato research, becau it provides across the board protecti against all five major fungus diseases," sa Dr. Joseph Evans of the Du Pont Industri and Biochemicals Dept. "In 39 field tria with other fungicides, 'Manzate' ranked fir in 22 tests and second in 12 more. Yiel with 'Manzate' averaged more than fo tons above check plots.

"In 1952 and 1953, its first years in wi use, 'Manzate' controlled an outbreak early blight along the East Coast, and su cessfully headed off an attack of late bligh Anthracnose did not appear in tomato fiel until harvesting was all but over. New Jers growers reported superior quality and in proved yields with no significant losses fro late blight or anthracnose."

Maneb fungicide really proved its mett

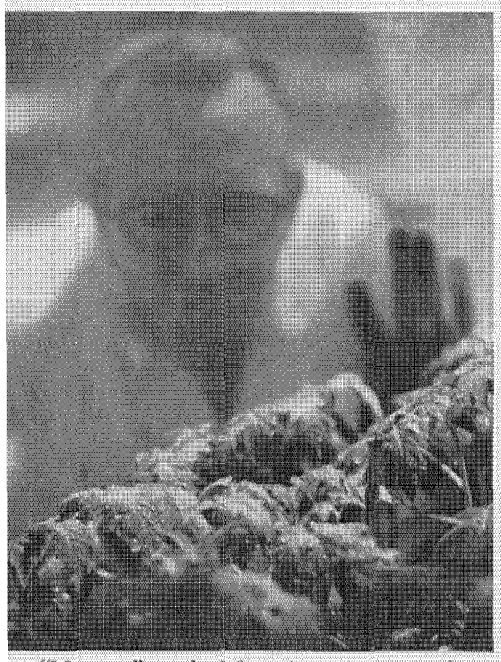


Spraying fields with "Manzate" begins early in the season, is repeated every seven to 10 days, depending upon weath conditions. Many tomato growers also add "NuGreen" urea fertilizer to sprays to provide plants with vital nitroge

as an adversary of late blight in Florida in 1957, recalls Dr. Evans. Beset by one of the worst epiphytotics in history, disease investigators tested 16 fungicides. "Manzate" held the blight in check even though the fungus had reached epidemic proportions; the other 15 tested were unsuccessful.

One of the earliest to recognize the advantage of "Manzate" was Campbell Soup Co., Camden, N.J. Ever since extensive tests in 1951, Campbell has recommended that its many contract growers spray regularly with maneb. Campbell suggests using maneb in ratios of three pounds per 150 gallons of water if acreage is boom sprayed, or three pounds per 40 gallons of water if mist sprayers are used. Applications begin about 30 days after the first fruit set; they continue every seven to ten days, depending on local and seasonal weather conditions.

"Tomatoes are the most important single vegetable ingredient in our long list of convenience foods, so we need both quantity and uniformly high quality," says Dr. Stuart G. Younkin, vice president of Campbell agricultural research. "For years we have urged our growers to spray early and often to control diseases and insects, thus insuring an adequate supply of processable tomatoes. The return for the grower has been a consistently profitable harvest, with far fewer downgraded tomatoes and culls."



"Manzate" resulted from intensive research on tomato's growing habits and fungicide effects.

With its business irrevocably linked to the tomato's vitality, Campbell had also thrown its aggressive research organization into high gear when late blight appeared. Result was the second significant industry-saving development: new and more vigorous plant strains, inherently resistant to cracking and thus less susceptible to fungus.

"The new varieties, named Campbell's 135 and 146, grew out of thousands of laboratory crossbreedings," explains Dr. Younkin. "Number 135 resulted from a combination of Burgess Crackproof, Wisconsin 55 and Improved Garden State strains. Its skin is aloof to moisture and it has better color. Number 146, a cross between Burgess, Wisconsin 55 and Brookston varieties, also resists cracking, and for the first time offers a tomato that resists Fusarium wilt, which can't be controlled either by crop rotation or fungicidal spraying.

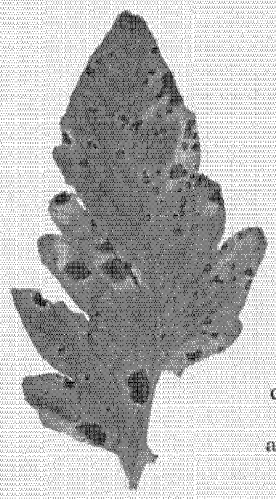
"The dual developments of maneb fungicide and new varieties now permit New Jersey growers to get yields comparable to California growers, who have an almost Utopian tomato climate. The two developments have been the most important factors in stopping the shift of processing acreage from east to west."

A comparison of harvesting records in New Jersey speaks for itself. Between 1950 and 1956, average yields ran between eight and 10 tons per acre. In 1956 tons per acre jumped to 14.5; in 1958 to 15.2; in 1960 to 18.2 and last year it was slightly above 20 tons per acre.

Another progress indicator is the history of the process growers' yield club. Established in the 1930's as the 10-Ton Club to spur greater effort, the organization became the 15-Ton Club a few years ago when more than 200 growers achieved 20 tons per acre or more. A few months ago, plans were laid to rechristen the organization the 25-Ton Club, because of the increasing number of New Jersey growers reaching that plateau.

The upswing in quantity and quality has had a corresponding effect on grower income, a critical item in view of steadily increasing labor costs and real estate taxes. Price per ton for Campbell contract growers was $15.86 in 1936; it was $33 last year. Gross return per acre in 1936 was $93, and last year it soared to $631.

The result is that the tomato is once again the sovereign of New Jersey's $52 million vegetable garden. "It climbed back to the top," says Dr. Younkin, "through hard work, persistence and, most definitely, science." ■



**MAJOR TOMATO MALADIES**

Early foliage blight shows as concentric brown rings. Smaller areas are Septoria Leaf Spot.



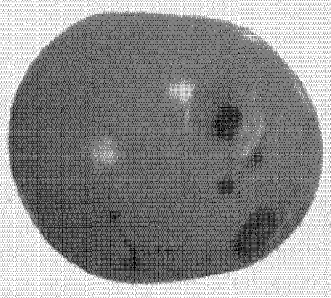
Late blight on foliage appears as dark brown, water-soaked areas on leaves and stems.



Late blight fungi attack both green and ripe fruit with greenish-black, firm rot.



Early blight on fruit is dark, leathery, sunken spots often accompanied by brown mold.



Anthracnose is small, round, slightly watery spots on both ripe and nearly ripe tomatoes.

# waukee

***The glowing faces of the Titan of all timepieces are made of tough, laminated safety glass***

*Milwaukee, Wis.*

For four months, all eyes in downtown Milwaukee trained upward as people pondered secretive doings on a shrouded tower some 280 feet overhead. When the veil finally lifted, the town first famous for its brewing industry boasted its latest notable achievement: the world's largest four-sided clock.

Looking out from the high tower are really four complete clocks, each weighing 24,973 pounds, including face, mechanism, lights and supports. Total for all four clocks is 50 tons. Sweeping the broad, 40-foot faces are 490-pound hour hands 16 feet long, and 530-pound minute hands 20 feet long. The seemingly small hour markings are actually four feet in length.

The colossal chronometer crowns the new block-square office and laboratory building of its owner, designer and builder, the Allen-Bradley Co. The octagonal outline of each clockface is the basic shape of the trademark found on the firm's electric motor control apparatus, hot-mold composition resistors and other electronic components.

"We wanted something unusual and appropriate for a big, modern building, and we had the personnel to carry out an idea like this ourselves," says Jerry Lohf, assistant plant engineer. "The designers and mechanics who turn out the special equipment for our manufacturing processes are used to handling jobs even larger."

Surprisingly, though, one of the first problems the company's designers faced involved ornithology rather than electronics. They learned that the tower, only a stone's throw from Lake Michigan, juts into a heavily traveled duck and geese flyway. Thus the clocks would have to be strong enough to withstand the impact of winging birds who might mistake an illuminated clockface for the moon in an evening sky.

## Invisible Protector

Consequently, the four clockfaces are made of laminated safety glass, a familiar product for which architects and designers are finding new uses. Laminated glass is made by bonding two pieces of glass with sheets of "Butacite" polyvinyl butyral resin, which imparts a shatter resistant glazing.

"Because of its safety feature, laminated glass was adopted early for windshields, and for years most people thought of the product as primarily an automotive one," says Bruce M. Donaldson, Du Pont sales manager for "Butacite". "But the Allen-Bradley clocks are a good example of the new kinds of applications in which laminated glass offers both functionality and beauty.

"For example, laminators can apply colors, textures and designs with silk-screen printing, brushing, spraying and even inserts. Some of the results are colorful and extremely strong table tops, soundproofing panels, interior and exterior walls, low-cost church windows that look like stained glass.

"An even more recent development is 'Reflectovue', a heat-excluding window glass by Laminated Glass Corp., Detroit. Containing vacuum metalized gold or silver pigments, 'Reflectovue' solves the architect's problem of heat transfer through glass by reducing transmission, radiation and convection by two to three times over conventional glass. It thus substantially reduces air conditioning costs and also lends esthetic appeal because the metallic mediums give a mirrorlike effect reflecting the outdoors."

## A Sandwich Sandwich

To obtain proper light transmission for the Allen-Bradley clocks (desirably 50 per cent) the typical laminated glass sandwich required additional ingredients: white translucent pigment between two half-mil-thick sheets of "Mylar" polyester film. Producer was Riegel Paper Corp., Charlotte, N.C.

" 'Mylar' is used because it's heat stable; it doesn't shrink at temperatures needed to bake on the pigment," explains Earl Huston, Jr., manager of Riegel's Industrial Film Dept. "To insure color uniformity, the pigment was made part of the sandwich's adhesive and was thus encapsulated between the layers of 'Mylar'."

The job of combining the pigment sandwich, clear glass and "Butacite" was assigned to Laminated Glass Corp. A pioneer in promoting safety glass for architectural uses, the company has developed an exclusive line of decorative laminates, including the one for the Allen-Bradley clock.

"Normally, the glass involves only a single sheet of 'Butacite', but in this case, a sheet was needed on each side of the pigmented layer to get a secure bond," explains Dick Miller, vice president of the Detroit firm.

"For each clockface, we produced 76 individual pieces of laminated glass, most of which were four feet square. Total weight of each glass face was approximately 3,900 pounds." The glass's aluminum mountings add another 1,650 pounds.

Fluorescent tubes behind each clock light the faces. Lighting and power to drive each timepiece require 34.6 kilowatts, enough electricity for 346 100-watt bulbs.

"The light from the clocks outlines our entire building and can be seen some 25 miles away," says Lohf of Allen-Bradley. "And as the ancient mariners used the moon and stars for navigation at night, boaters on Lake Michigan use our clocks to guide themselves safely into the city's harbor." ■



*Offices, public buildings, hospitals . . . all should welcome "Vistelle Corlon".*
*Resisting dents, burns and stains alike, it's*

# A TILE STYLED FOR

*Lancaster, Pa.*

The mars, scars and stains usually deposited by scurrying feet like those above will be shrugged off in an extraordinary manner by the resilient tile in this photograph.

The unsightly dents hammered into the floor by clacking stiletto heels will gradually disappear; the tile will spring back and recover a smooth surface. Dirt, traffic soil, lipstick or grease will wash away without trace of smudge or discoloring. Most important, the floor won't char or scar as prior materials do when absent-minded smokers drop or grind lighted cigarettes underfoot.

Called "Vistelle Corlon" tile, the newly announced research development of Armstrong Cork Co. is designed specifically for modern commercial and institutional interiors, where floor punishment is incessant and severe. The product is based on "Hypalon" synthetic rubber, a resilient Du Pont elastomer whose other rough-duty applications include long-wearing shoe soles and heels, colorful roofing systems, crack-resistant tire whitewalls and heat-stable insulation on automotive primary wire.

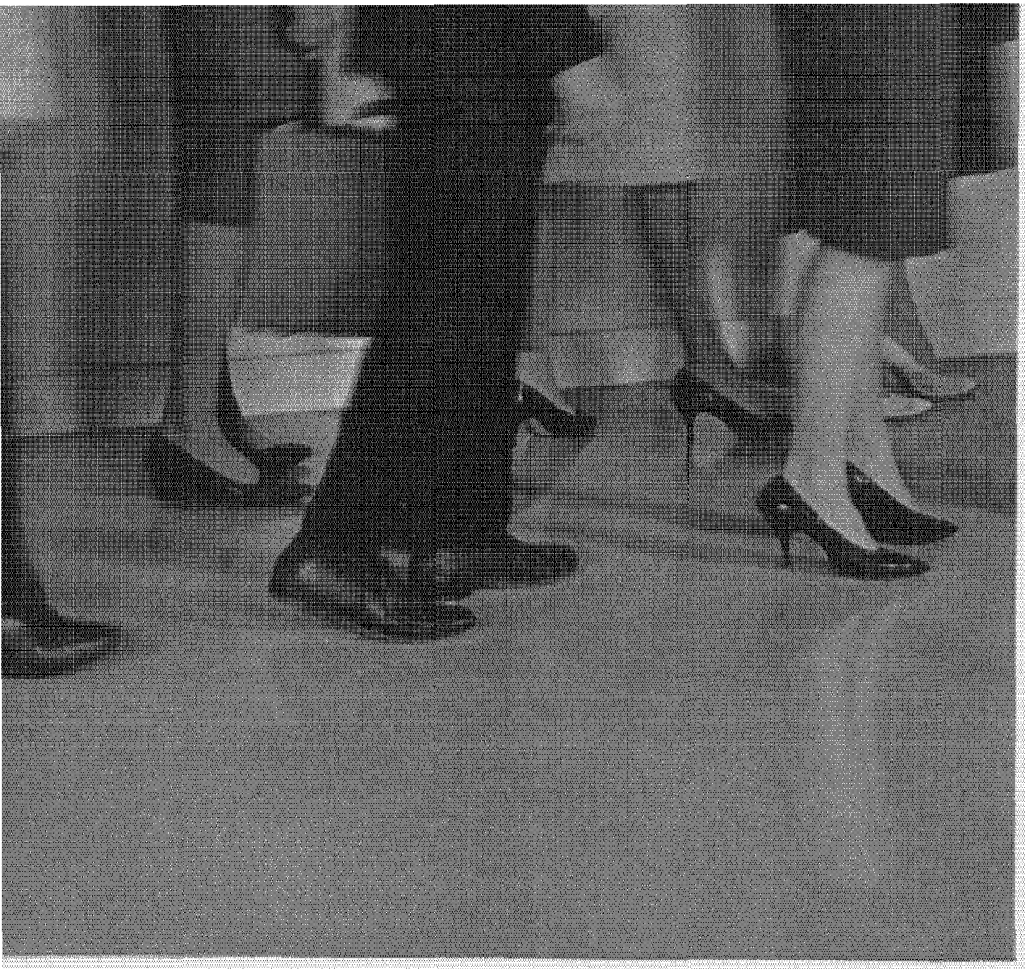
Adapting "Hypalon" to flooring has been a long research effort; the yellowed lab notebook of one Armstrong chemist records first experiments with the elastomer in 1952. But steady pursuit of the new is a familiar Armstrong story: half the company's $322 million annual sales stem from products its research has introduced in the past decade.

What's perking up the ears of architects, builders and other specifying agents in this case is Armstrong's conclusion that "Vistelle" is "the most significant new flooring material since the development of vinyl."

Armstrong is wary of superlatives; its promotion adjectives are tempered both b
experience and a 500-man Research an
Development Center. "But," says Richar
A. Angle, marketing manager, Floor Div
sion, "five years of field tests indicate tha
'Vistelle' offers the best combination of phy
sical properties and functional advantage
ever blended into one flooring material."

Since World War II, Angle explains, th
varied needs of modern building have le
to a proliferation of flooring material
These vary greatly in ability to withstan
harsh treatment, abrasive matter or soilin
Proper choice of a floor demands study c
countless factors, including type of slab c
subflooring, air conditioning, radiant hea
ing, presence of sunlight, traffic loads, sty
ing, comfort, maintenance costs and dolla
budgeted for floors.

"What's so unique about 'Vistelle' is tha





Resistance to burns, above, plus recovery from indentation like that from stiletto heels, below, equip "Vistelle Corlon" tile for heavy traffic.



# TRAFFIC

By William Halley

it blends so many superior characteristics in a single material — and particularly that blend of properties most needed in heavy-traffic installations."

High among these is the resistance of "Vistelle" to permanent indentation—coupled with the fact that it's comfortable to walk upon.

While it's obvious that walking wears floors, most people don't realize how high typical impact pressures actually are. "For example, the spike heels of a 105-pound girl exert some 2,000 psi when they strike the floor; if the heel is worn, the woman's weight, acting dynamically on three nailhead contacts .01 to .02 inch in diameter, produces pressures ranging from 12,000 to 60,000 psi."

While the weight of a 225-pound man, spread over a 3x3 heel, exerts only 12 psi, metal cleats, taps or hard leather heel edges complicate the denting problem. The result is floors that chip, disintegrate or indent permanently, creating an irregular surface that's unsightly and hard to keep clean.

Some materials, such as conventional terrazzo, marble and the better unfilled vinyl tiles, resist indentation simply because they're so hard. But they offer this benefit at the expense of underfoot comfort.

This, Angle points out, can be quite a sacrifice. In retail stores, hospital corridors, restaurants and commercial buildings, prolonged walking and standing on a nonresilient floor create undue fatigue.

"Vistelle", however, provides a relatively soft surface. It gives on impact, but recovers when pressure is released. It's easy on the feet and legs, yet remains free of marks.

The resilience of "Hypalon", which

*continued*



Beauty and utility blend in "Vistelle Corlon" tile of new Carson Pirie Scott & Co. store, Chicago.

doesn't decrease with age, also cuts the noise of footsteps, wheels or dropped objects.

Second major source of dismay in public buildings, offices, restaurants, bars or beauty shops is cigarette burns. Heat of a coal dropped by a preoccupied smoker is estimated to range from 700° to 1200°F. Many a gorgeous vinyl floor is thus defaced: the heat melts the vinyl, making first a bubble, then a rupture on the surface. The result is an unsightly dirt catcher.

To compare "Vistelle" with other materials, Armstrong research men simply lighted cigarettes, laid them on tiles and left them to burn out. The tiles were then cleaned with fine steel wool and a commercial floor cleaner, and the remaining stain given a severity rating from 0 to 5.

"The surface of 'Vistelle' tile was unbroken," Angle reports. "Staining was so slight that it was undetectable at arm's length. The vinyl tiles were irreparably scarred, and the rubber tile severely stained."

Greases and alkalies are other bugaboos of institutional flooring. These originate not only from spills or alkaline moisture migrating through slabs, but from prolonged cor tact with strong floor cleaners, cooking res due or kitchen vapors. Beset by such force flooring materials often swell, soften, di color or change physical properties.

"Vistelle", however, shows unusual re sistance. In tests with 100 solvents, acid and chemicals — plus an equal number c common household staining agents like lip stick, grape juice, crayon and ink—the proc uct earned an average rating of one or be low. This indicated very slight or no stai

The durability and dimensional stabilit displayed by "Hypalon" in other applica tions carry over to "Vistelle". In one ex cruciating California field test, the Arm strong tile spent two years on an outdoc ramp over which four million people passe —6,000 a day. Although constantly abrade by sand and gravel from adjacent areas, th tiles lost only 20 per cent of their thickne in the two-year stint.

## Rich, Durable Colors

Initially, "Vistelle" is being offered in te colors in the contemporary designs mo practical for commercial use. Here, th colorability of "Hypalon" is utilized. "Th whites are whiter, blacks deeper, colo richer," says Armstrong's Angle. "Desig are sharper, too, because colors don't blee —i.e., overlap one another. They're als highly resistant to yellowing or fading cause by sunlight."

Although it's relatively expensive ($1.5 to $2.00 per square foot, job size considere installed over concrete), "Vistelle Corlon is attracting architects because its balance properties promise the ultimate in long-ter utility and beauty. The effect of this unio is evident in the elegant Louis XVI settin left. Carson Pirie Scott & Co. wanted rich, luxurious effect in the beauty salon its newly dedicated 240,000-square-fo store in Chicago's Evergreen Plaza shoppin center. But the 109-year-old firm, which ha 26 stores in three states, also needed a floo ing material that would stand up under beauty salon's prime hazards: the indent tions of spike heels and the burns of cig rettes. To blend esthetics with durabilit the architect chose "Vistelle Corlon".

Opening day crowds at the new store we reliably estimated at "tens of thousands, with proportionate numbers of visitors t the beauty salon. All parties were please including Armstrong's Dick Angle. "'Vi telle'," he says, "is styled for traffic."

*To help teen-age girls put their best foot forward, a noted fashion designer and Du Pont fibers men suggest*

# The Well-Mannered Look

"Beauty of style, harmony and grace depend upon simplicity," Plato told the Athenians in the fourth century B.C.

To fashion-conscious teen-agers, award-winning New York designer John Weitz today is giving similar advice, capsuling his views with the word "classic."

"By 'classic'," explains the father of a 15-year-old daughter, "I mean presenting oneself with the air of dignity, simplicity, good taste and restraint that makes such people as Jacqueline Kennedy and Princess Grace adult fashion leaders."

Heartily seconding Weitz's sentiments is the Du Pont Textile Fibers Dept., whose teen wear marketing group is nourishing a new fashion code in the classic spirit. It's christened "The Well-Mannered Look," and Weitz's designs are an integral part.

"As a supplier of fibers that go into today's fashions, we naturally have a deep interest in style and taste as well as the functional properties of a young woman's wardrobe," says Dr. W. Brown Vincent, teen wear marketing manager. "Like their mothers, teen-agers eagerly seek fashion information; they study ads, compare opinions with their friends. All too often, however, there's a shortage of facts and advice beamed directly at this age group."

The oversight is not a tiny one, Vincent points out. In the U.S. today, some 7.3 million school girls, ages 13 to 17, spend $2 billion annually on their wardrobes. And by 1970, this age group will grow to 9.6 million youngsters—an increase of 32 per cent.

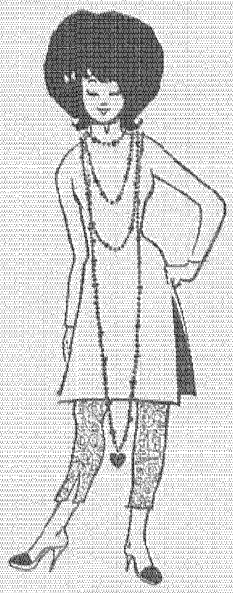
"To an astonishing degree, these girls buy independently of their parents. They select what takes their eye or what looks glamorous or what they think their peers are wearing," says Vincent. "And with the profusion of modern styles, fashions and fads, there's a lively possibility that a teen-ager will choose unwisely—buy garments that are in-

*continued*



**YEA:** Well-Mannered Look for parties is piqué of "Dacron" polyester fiber and cotton, with fitted bodice, puffed sleeves, a demure neckline and a flared skirt.

**NAY:** An oriental dress, too high heels, teased hair and too many beads are "too old and too soon."



# The Well-Mannered Look

continued

appropriate to her years, that ape the *femme fatale* or the mature movie queen."

Reasons are cited by psychologist and author, Dr. Allan Fromme, who consulted with Du Pont and designer Weitz on The Well-Mannered Look. "Teen-age," Dr. Fromme says, "is a period of self-awareness, when many new feelings and sensations crowd in on the maturing girl. Dress becomes very important and sometimes even assumes a 'club' or 'tribal' significance.

"Strangely enough, at a time when the average teen-ager is most self-conscious, she dresses in a way that almost surely causes attention and comment. While trying to blend in with the crowd, she unknowingly adopts faddish garb that makes her feel uncomfortable and conspicuous."

## Guidelines for Girls

The sheer volume of the teen-age market, coupled with growing awareness that its members need guidance, eventuated in The Well-Mannered Look. "We wanted to set some guidelines by which girls could be helped to select the right thing to wear at the right time," says Vincent. "At the same time, we were looking hard for styles and ideas about the teen market that we could convey to designers and manufacturers."

First step was to enlist designer Weitz to translate the "well-mannered" idea into concrete examples of the way "teen-age girls really want to look." The resulting costumes were then presented to the jury: a special fashion show in New York for 100 teen-age girls and their mothers—plus 300 members of the fashion industry.

"The girls applauded enthusiastically, and there was some astonishment among mothers who discovered their daughters do approve of things other than blue jeans and beehive hairdos," recalls Du Pont's Vincent. "The Weitz creations set a high standard of dress for teen activities from churchgoing to bowling; they also took maximum advantage of the versatile properties offered Du Pont fibers.

"The show technique was simple: Weitz costumes were contrasted with f size caricatures which humorously depic the major offenses against good taste. though we exaggerated slightly, the girls only got the point, but were entertaine

A typical illustration of proper and proper teen-age costuming dealt with pa



YEA: Skiing outfit has knicker pants, zip-front jacket and head-hugging cap, all in white poplin of "Dacron" and cotton and all lined with pile of "Orlon" acrylic fiber.

NAY: Over-decorated ski costume has a fuzzy fur hat, too-tight pants and sweater, gaudy jewels.



NAY: Draped dress, fussy shrug jacket, a flowered hat and spike heels look more matronly than teen.

YEA: Tasteful costume for church is a navy coat with a faint A-line silhouette, brass buttons, a notched collar and slash pockets. Coat is made of brushed nylon fabric.



ensembles. Weitz interpreted The Well-Mannered Look in a white bird's-eye piqué of "Dacron" polyester fiber and cotton, featuring a fitted bodice, puffed sleeves, demure neckline and a moderately flared gored skirt. This was contrasted with a costume that Weitz describes as "too much, too old and too soon": a dress of exotic, oriental flavor, festooned with flashy accessories. The completed caricature, with "teased" hair looking like shrubbery and openback shoes with stiletto heels, presented a kind of Auntie Mame adolescent.

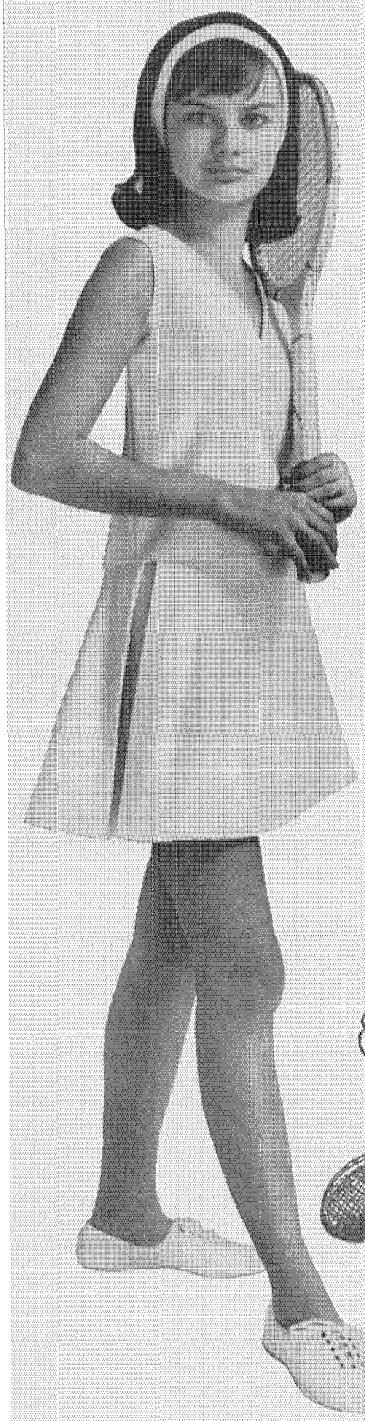
Other "yeas" and "nays" of the show are pictured on these pages.

With their judgment vindicated by the teen-age jury, Du Pont fibers men are now taking The Well-Mannered Look program to customers, converters, manufacturers and retailers. "Obviously, many teen-agers already dress in the classic spirit and many manufacturers make and sell such garments," says Dr. Vincent. "Our goal in showing the collection is to attract more industry attention to this market and to help retailers advise and assist teen-age shoppers."

In addition, the Textile Fibers Dept. this summer will make a movie featuring classically dressed young ladies visiting the cultural centers of New York. By August, the film will be available for showings in stores; it will be available to schools by fall.

In schools, too, Du Pont representatives will help home economics classes introduce the classic look to sewing instruction and fashion shows. And later, outstanding students who best reflect The Well-Mannered Look will be chosen in various cities and awarded either scholarships or expense-paid trips to New York.

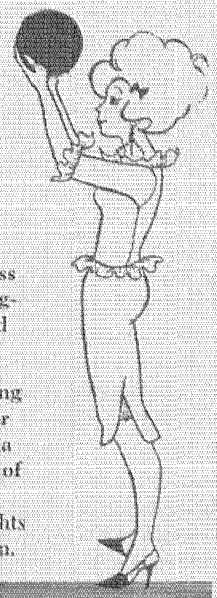
Such activities, says Du Pont's Vincent, will aim to provide teen-agers with a rule of thumb, "To dress well is to dress appropriately—in harmony with the occasion, one's age, one's personality—in sum, to reflect The Well-Mannered Look." ■





**YEA: Styling for tennis features a short, flared skirt with inverted side pleats and a sleeveless, V-neck blouse. Both are made of white sailcloth of "Dacron" and cotton.**

**NAY: A midriff, bared by pants that hang from the hips and tied shirttails, is out of step for teens.**



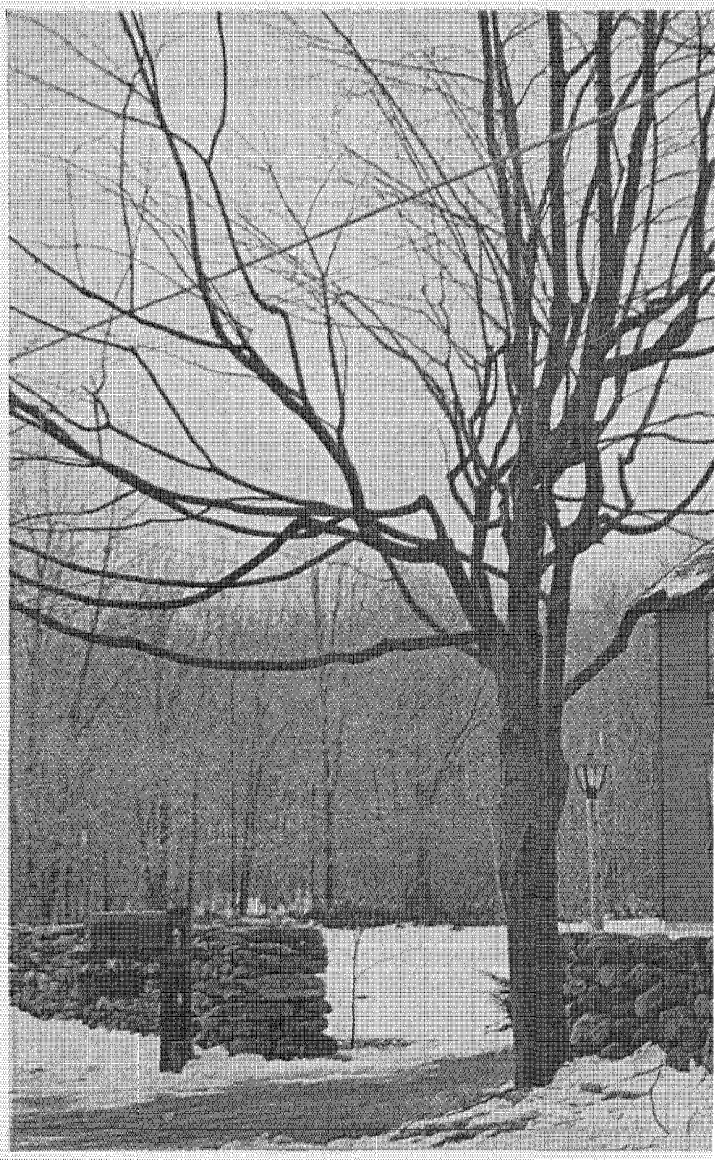
**NAY: Form-fitting dress with tight sleeves, slingback pumps and teased hair score low in style.**

**YEA: A striking bowling outfit features a jumper of "Orlon" and rayon, a polka dot, poplin shirt of "Dacron" and cotton, and modish stretch tights of black Du Pont nylon.**



*Du Pont acrylic resin has long been at work to brighten the householder's life. Now it branches out to provide*

# The First "Universal" House Paint



By Jack D. Hunter

*Westport, Conn.*

In the broad band of pastoral Connecticut embraced by the New York commuter belt, where thousands find night-and-weekend sanctuary from Manhattan's workday frenzy, he who lives in a barn is no odd-ball. Here it's long been considered both fashionable and sensible to transform rural structures—from gristmills to schoolhouses—into elegant homes. The consensus of those who've done so: the city's distant sound and fury seem even more remote when shut out by a lovingly reclaimed rustic wall.

The pleasant red house, right, typifies such conversions. Built in 1860 as a shelter for assorted farm animals and their feed, it has, under the touch of owner Jackson Hand, become a home that's roomy, comfortable and redolent with the early American charm that has made Westport a synonym for gracious exurban living.

But for all its typicalness, this house is, in a sense, atypical. Reason: It's the first dwelling in Westport and probably anywhere in the U.S. to have had its exterior painted surfaces recoated with an entirely new kind of outside house paint. It won that distinction nearly three years ago, thanks to Hand's do-it-yourself audacity and Du Pont's carefully reined enthusiasm for "Lucite" acrylic house paint, which it then suspected and now confirms to be the industry's first "universal" outside house paint. (In paint industry parlance, "universal" denotes a paint's ability to cover a variety of surfaces.)

In 1957, after nearly a decade of research, Du Pont introduced the paint on a limited test basis for use over properly primed new or bare wood only. This month, though, the company has brought out a vastly improved product, free from such limitations, and is making it available for use over primed or previously painted wood, as well as masonry, composition siding, shingles, stucco, brick and concrete block. Moreover, the new paint, when applied over a sound surface, promises as much as 50 per cent longer life than conventional oil-base paints.

The significance of this "universality" and longer life is immediately apparent to the householder dedicated to doing his own maintenance painting. Where once his garage shelf might hold a platoon of half-used cans of masonry paint, siding paint, metal paint and primers for each, he can now envision a can of "Lucite" house paint, and, perhaps, a can of primer for spotting jobs and a third for high-gloss trim and shutter work. And, instead of painting his house about once every five years, he can now expect to do it only every seven or eight years.

This portent didn't escape Jackson Hand, either, when, as a free-lance writer specializing in industrial subjects, he was able to try field samples of the first limited-use paint. He was "intrigued" by the product's characteristics and asked Du Pont why "Lucite" couldn't be used on the outside of his previously painted Westport barn conversion. Du Pont's answer, in essence: "Take it easy, Jackson; we're still trying to explore the potential of 'Lucite' ourselves. And, frankly, we're not yet ready to claim it will work satisfactorily over previously painted wood." (It wasn't until 1961 that

Du Pont settled on the formula now used in "Lucite" house paint; the months since then were devoted to even further testing.)

Unabashed, Hand nevertheless ordered sufficient gallonage of "Lucite" in Mohawk Red and he and his wife went to work. The paint has since gone through three summers and two winters, and, Hand says, "It looks as snappy today as it did when it went on." Adds he: "We simply got a head start on Du Pont's laboratories."

What is "Lucite" acrylic house paint?

The name comes from Du Pont's trade-

*continued*




**Rugged Connecticut winters have left no mark on 100-year-old barn remodeled into home whose previously painted outside was coated three years ago in introductory version of "Lucite" house paint. Owner, left, now finds that new formula permits painting house's concrete foundation.**

# The First "Universal" House Paint

*continued*

mark for its acrylic resin, which made its first appearance years ago in the form of luxury brush and mirror handles, and subsequently found use in aircraft canopies, in TV picture tube screens, in auto taillights and many other forms. The house paint is based on a special emulsion polymer of the same chemical building blocks from which these products are made.

By classification, the new paint is an "emulsion coating." The difference between oil paints and emulsion paints is that the former are composed, basically, of oleoresinous solids dissolved in highly volatile solvents, while the latter are products of emulsion polymerization which permits them to exist as resin dispersions in plain water. In each case, the liquid evaporates, leaving a film of the basic material. The durability of a paint is determined by how well it resists the deteriorating effects of time and weather. Several synthetic resins have been used in paint—mainly butadiene-styrene, polyvinyl acetate and methylmethacrylate. Du Pont selected the acrylic because of five major performance advantages: (1) Its adhesion to any paintable surface is excellent; (2) it provides a film that has the extraordinary ability to shed water while allowing interior water vapor to seep readily through; (3) its long life in an emulsion paint formulation; (4) its color-purity and cleanliness; and (5) its ability to permit the formulation of a paint that requires minimum stirring and is easy to apply.

("Lucite" acrylic house paint is not the same as "Lucite" wall paint, the interior paint that has had such an impact among do-it-yourself interior decorators. It's an entirely different formulation designed to meet an entirely different set of performance requirements.)

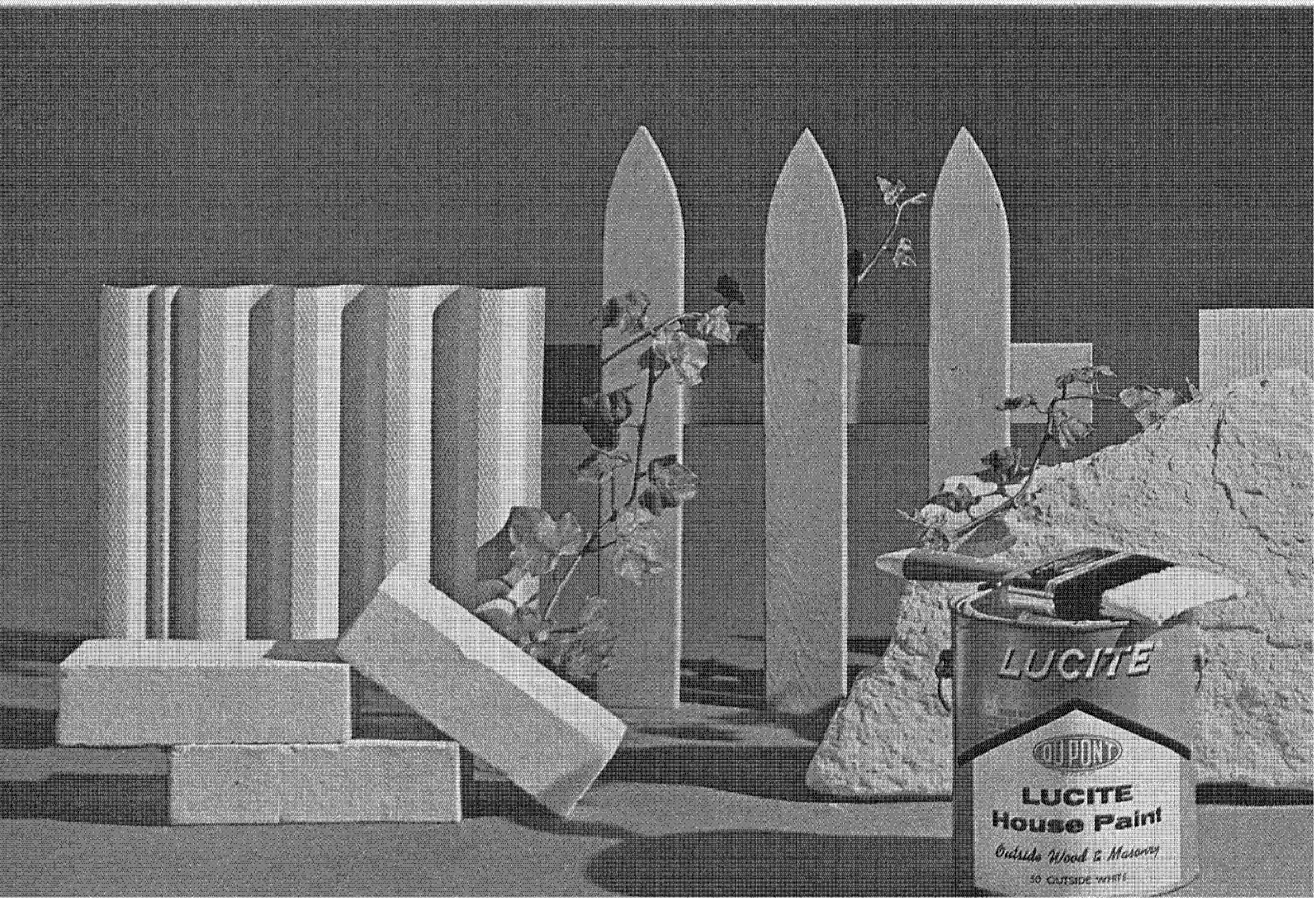
### Dries in Minutes

Unlike oil-base paints, the new outside house paint can be applied even over damp surfaces, which means that painting can be started earlier in the day. The fast-drying characteristics ("Lucite" house paint dries in minutes instead of hours) permit recoating within two hours after the first application and reduce the pickup of insects or dust on the fresh paint during drying.

Outstanding elasticity and breathability of the acrylic paint film are the two most important factors in its durability. Laboratory tests show that an unsupported film of "Lucite", even after the equivalent of six months' aging, can be stretched 125 per cent before breaking or failing. Conventional oil-base house paints, under the same test conditions, fail after being stretched ten per cent. Such elasticity permits the paint film to expand and contract over a wide range of temperature changes without cracking, even under the pressure of moisture migrating through the wood from inside the house.

Du Pont paint chemists point out, however, that any top paint coat is only as good as the substrate on which it's coated. Over new or bare wood properly treated with a base coat of Du Pont No. 49 blister-resistant primer, the new "Lucite" exterior paint provides virtual assurance against blistering. Reason: The paint film "breathes," allowing interior moisture vapor to find its way out without causing the exterior paint to form a small balloon. At the same time

Variety of surfaces that can be painted with "Lucite" acrylic house paint range from previously painted wood to field stone.



it resists the effects of rain or snow.

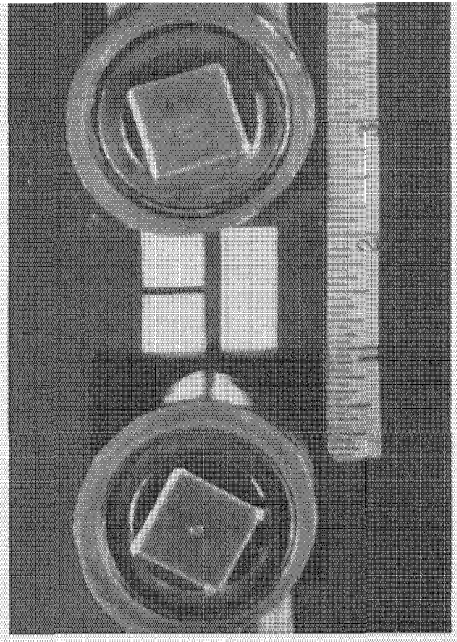
Conventional oil-base paints are virtually impermeable and thus more ready to blister. Such paint film breaks when blister pressure stretches the paint beyond its elastic strength. While "Lucite" exterior paint won't prevent the formation of blisters behind an oil-base paint over which it's applied, its greater permeability reduces the risk of moisture blistering often associated with the build-up of film thickness of impermeable conventional oil-base paints.

To assure a sound surface for adhesion of "Lucite" acrylic house paint, home painters should scrape or sand blistered areas down to bare wood and well back from the area of damage; a coat of "Lucite" primer should then be applied over these before the paint is brushed or rolled on. Two coats of "Lucite" are recommended for best results, and that's where the easy-spreading, fast-drying properties of "Lucite" make the job easier and faster. The creaminess and homogeneity of the paint minimize drips and runs, and tools can be washed clean in running water without the conventional soaking in turpentine or paint thinner. Spills can be wiped up with a damp cloth.

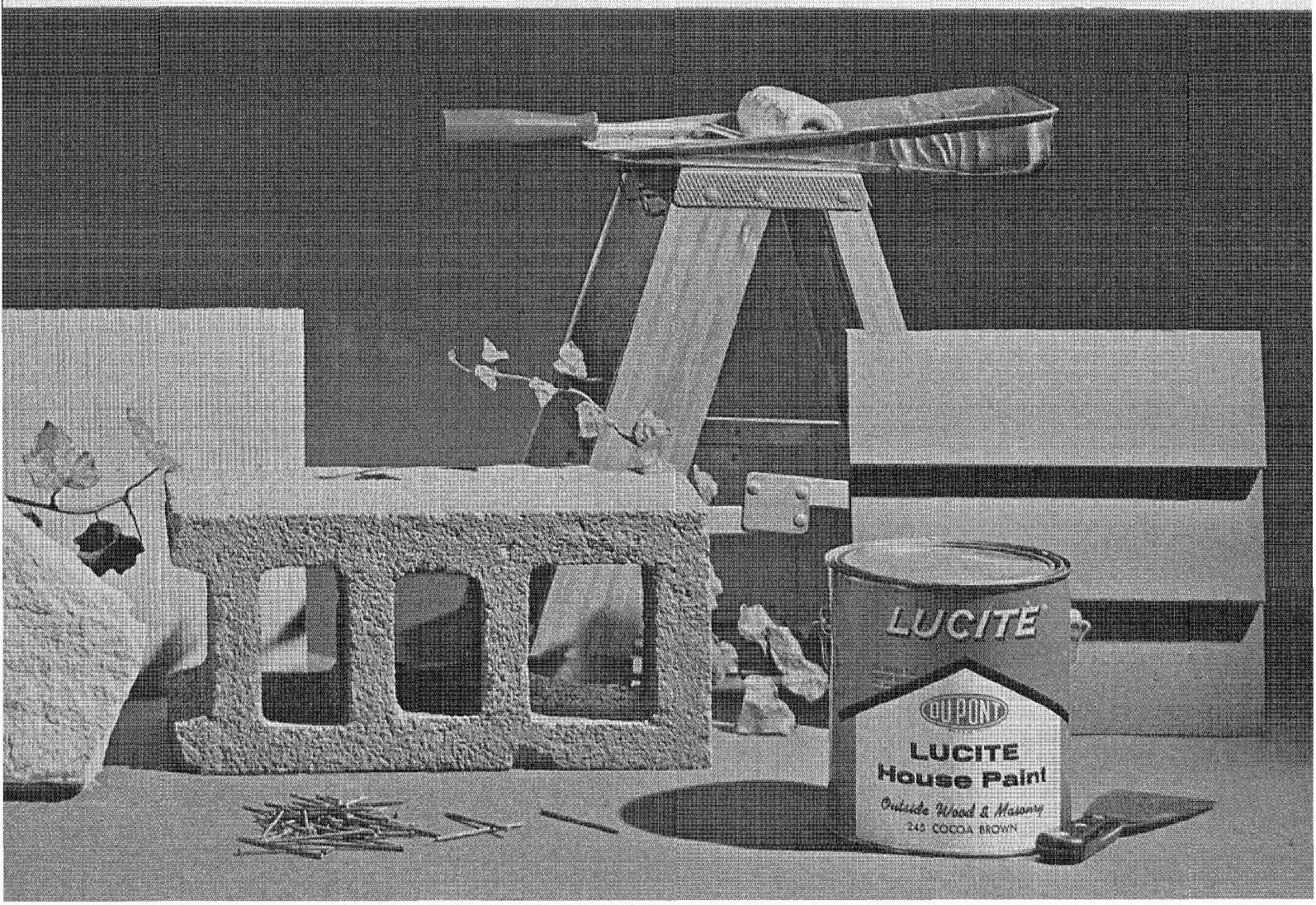
Du Pont sees no replacement of conventional oil-base paints by the water emulsion paints. Charles Dingle, trade sales manager for Du Pont's Fabrics and Finishes Dept., says he believes "there'll always be the two types of paints—each does a particular job especially well." He and his colleagues consider "Lucite" acrylic house paint to be an especial boon to the do-it-yourself market, while expecting the oil-base paints to retain their strong hold on the professional trade.

But whatever the U.S. consumers' ultimate ruling at the retail counter, Dingle chuckles agreement with Jackson Hand's prediction that the householder will continue to demonstrate his amazing capacity for defining to the manufacturer new needs and specifications for his products. Someday, Hand believes, there will be a letter to Du Pont from Hawaii:

"Dear Du Pont Company: My wife and I have just finished painting our little grass shack with 'Lucite' house paint, and you'll be interested to know . . ." ■



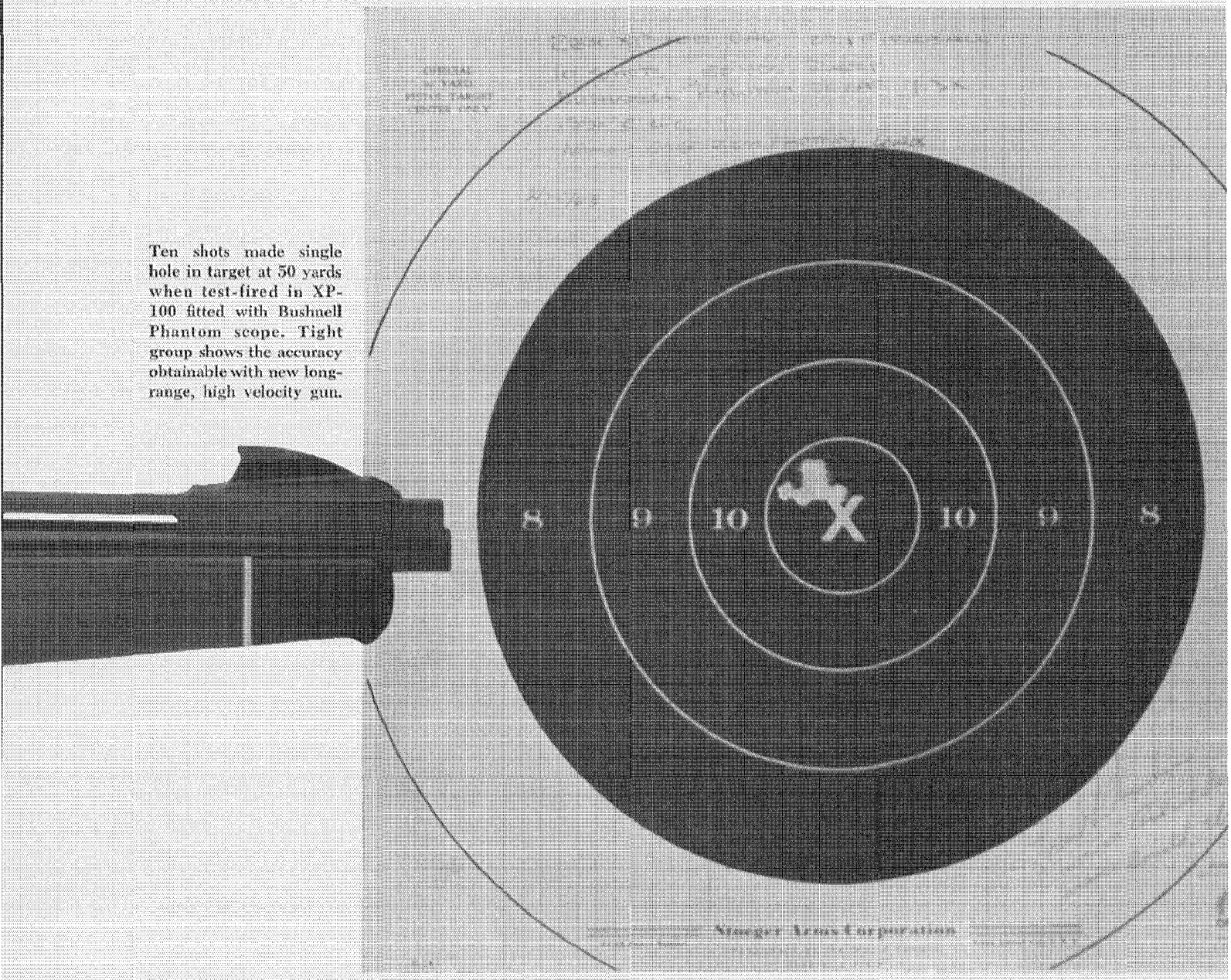
Lab test shows film of "Lucite", right, still stretching while conventional house paint, left, has failed after stretch of ten per cent.





*It takes real marksmanship*
*to control the destructive varmint.*
*But now the shooter's chances*
*are boosted with Remington's new*

# *Power*




Ten shots made single hole in target at 50 yards when test-fired in XP-100 fitted with Bushnell Phantom scope. Tight group shows the accuracy obtainable with new long-range, high velocity gun.

# Packing Pistol

Nobody has much good to say about varmints. Dictionaries, which dismiss them icily as "small, noxious animals," are far kinder than U.S. farmers and livestock growers. For men of the soil, varmints—rats, woodchucks, weasels, coyotes, foxes, bobcats and their ilk—are gluttonous plunderers that ghost through crops and stalk barnyards and flocks to work incalculable ruin. (The U.S. Dept. of Interior estimates that without control of coyotes alone, for example, livestock losses would amount to at least $20 million a year.)

Only the sharpshooting sportsman considers varmints worthy of a kind of respect: wily and elusive, these furry predators offer the shooter some of the most challenging targets going.

Traditionally, farmers and sportsmen have relied on shoulder arms to keep the varmint population at a tolerable level. But in recent years, an increasing number of shooters have turned to handguns for hunting both varmints and small game; the consensus is that this offers a sportier test of marksmanship ability. Responding to the trend, manufacturers have developed new cartridges with jacketed bullets, high velocities and flat trajectories designed specifically for this kind of shooting. Moreover, makers of optical instruments have introduced telescopic sights especially suited to handgun use.

All well and good, shooters found, but there were problems arising from the guns themselves. Even with the best loads and scopes, few shooters could hold the conventional handgun steady enough to take maximum advantage of them—particularly when

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long ranges were involved. Furthermore, other characteristics of conventional handguns (example: the gap between cylinder and bore in revolvers lets gas escape, causing a critical loss of projectile velocity at longer ranges) compounded negative performance factors.

What was needed, Remington decided, was a handgun that literally ignored all concepts embraced by conventional models. With this release from tradition, Remington designers came up with the XP-100 — a 16¾-inch-long single shot handgun with a bolt action similar to that used on Remington center fire big game rifles. A new cartridge, the 221 Remington "Fire Ball", was developed for use with the new gun.

Pistol and load have inspired Remington to claim "a new, highly accurate handgun and cartridge combination, which, because it has down-range ballistics comparable to many rifle-cartridge combinations, outshoots and outperforms any other on the market today."

The XP-100 has a grip and stock made with one piece of molded Du Pont "Zytel" structural nylon. Because this material maintains its dimensional stability under all conditions (it cannot warp or change shape), the barrel bedding is absolutely uniform, a factor insuring greater accuracy. The grip is contoured to fit the shooter's hand and is adaptable to right- or left-handed use. Scientifically balanced to give minimum whip, jump and recoil, the XP-100 is pronounced by shooters to be altogether comfortable to handle and fire.



Minimum whip, jump and recoil of XP-100 result from scientifically balanced design. Contoured grip of "Zytel" boosts shooter comfort.

The new gun's bolt is exceptionally strong, since it completely encases the cartridge head in a ring of steel. Fired cases are automatically extracted and ejected when the bolt is opened.

A ventilated rib is used on the barrel to improve the sighting plane, and a distinctive blade front sight and rifle-type rear sight, adjustable for windage and elevation, are incorporated. The receiver is drilled and tapped for easy mounting of scope blocks, and a rotating thumb safety is conveniently located near the bolt handle. Barrel length is 10½ inches.

In its styling, the XP-100 utilizes decorative custom-style checkering, white spacers and diamond inlays in the stock and grip. Internal fore-end cavities permit the addition of weights to suit personal shooting preferences. Furnished with carrying case, the gun weighs 3¾ pounds.

Concurrent with the gun development, Remington ammunition specialists gave their attention to the load best suited to use with the XP-100. They devised the "Fire Ball", which has a 50 grain jacketed bullet and is said to be the hottest varmint and small game handgun load now available. Its muzzle velocity is 2,650 feet per second, and muzzle energy is 780 foot pounds. Even out at 300 yards, the bullet still moves at 1,460 feet per second—a velocity that gives the handgun shooter a boardinghouse reach.

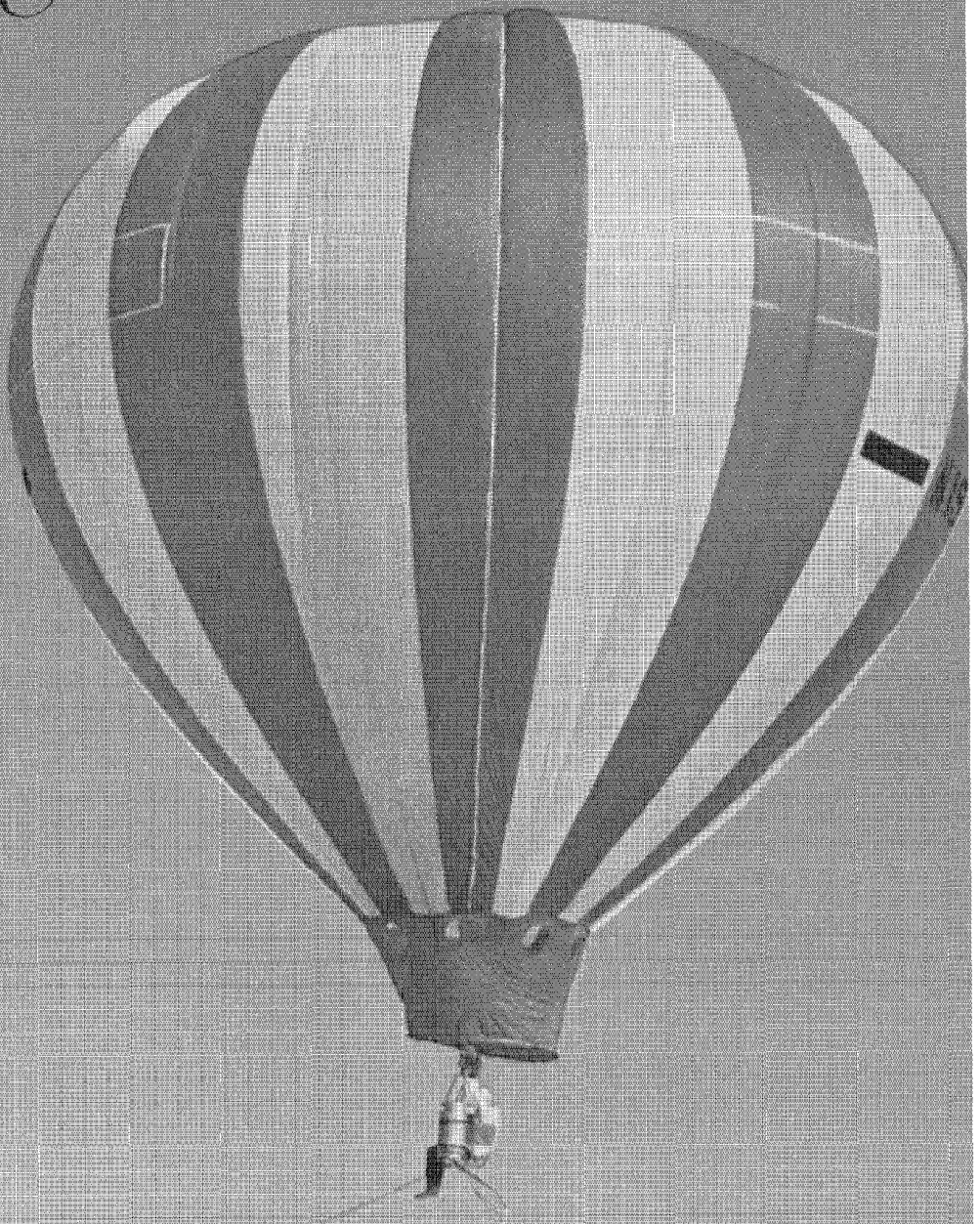
The XP-100 is the first handgun Remington has produced in nearly three decades. The company was, of course, noted for both shoulder arms and handguns throughout the course of early U.S. history and the American surge to the Pacific. However, the company decided in 1934 to concentrate solely on purely sporting arms, and, since the primary market for handguns at the time lay among military and law enforcement agencies, such projects were shelved.

The last handgun produced by Remington in that period was the 32 caliber Model 51 semiautomatic pistol. One of these was carried in World War II combat by the late famed General George S. Patton as a companion piece to his equally famed ivory-grip revolvers. When asked why he favored the Remington automatic, he answered with characteristic bluntness: "Because it shoots harder than any other handgun."

Remington engineers believe General Patton would have liked the XP-100. ■

*By channeling hot air into a 40-foot bag of nylon, balloon enthusiasts are*

# Sailing the Vulcoon



From a point 1,500 feet above the California desert, the orange-striped, 40-foot nylon balloon repeatedly climbed, settled earthward, then rose again. Pretty soon, curious jets from a nearby base were buzzing about like puppies getting their first astonished look at a turtle.

"The vertical pattern apparently puzzled them; I must have looked like an aerial yo-yo," chuckles the sportsman-pilot, Dr. William McGrath, who's also Dean of Students at the University of Southern California. "Actually, I was just going up and down looking for a wind current headed in the direction I wanted to go."

That McGrath, unlike traditional balloonists, could control his craft so easily is attributable to hot-air balloon research by Raven Industries, Inc., Sioux Falls, S.D. To a gas burner with a simple dial control, the firm has coupled a strong, lightweight nylon skin. The results are two: first, precise control of buoyancy; second, so much interest among adventurous U.S. civilians that the company has instituted a Sport Balloon Division. It's headed by Don Piccard, son of the famous aeronaut, and himself the holder of seven of ten world class altitude records.

Modern ballooning, Piccard explains, has been based on inflating an impermeable material with a gas lighter than air. Hydrogen, whose flammability caused the *Hindenburg* disaster in 1937, was long used; now, safer helium is most common.

Raven's sport balloon follows opposite principles: it's made of semipermeable nylon fabric, and its lift is provided by air.

Dubbed "Vulcoon" (from Vulcan, god of fire, and balloon), the radish-shaped nylon bags contain 30,000 cubic feet of air about 130° hotter than outside temperatures. During flight, cooling air in the bag

*continued*

# Sailing the Vulcoon

*continued*



Sportsmen inflate nylon Vulcoon by pumping hot air into open end. When 40-foot balloon reaches upright position, pilot mounts seat and turns on in-flight burners that start craft's flight.

is replaced by a fresh supply of warm ai streaming upward into the open-bottome balloon from a bottled gas burner just ove the pilot's head.

The burner, fueled by two propane tank with gas sufficient to bear a man aloft fo four hours, makes piloting as simple as op erating a kitchen range, Piccard says. T climb, turn up the heat and make more ho air; cut back on the burner and you descen accordingly.

## Turn Burner Off to Land

At landing time, you simply turn off th burner completely at 80 feet; at the instan of touch-down, you fire an electric squi that opens a deflation port in the top of th balloon. Out zooms the air and the bi radish collapses; the light nylon is ready t be packed up and carried home.

"Because the pilot can go up or down a will to catch the wind current he wants, h has much greater control over his cours than with other balloons," Piccard says "He can rise rapidly when approaching suc obstacles as mountains or quickly check a over-rapid approach to earth; in a pinch, h simply pushes a button that kicks the ga supply wide open."

By contrast, maneuvering the typical ga balloon is a crude procedure. Such a vehicl starts its flight with maximum buoyancy this diminishes as gas leaks away. To avoi climbing too far or fast, the pilot release some of his irreplaceable gas; to avoid descent, he heaves over the side some of hi equally irreplaceable sand ballast. How lon he flies depends upon his skill at doling ou gas and sand.

The fact that "smoke" would lift balloon



Pilot controls Vulcoon by adjusting overhead burners fueled by propane gas tanks flanking chair. Burners provide lift by manufacturing constant stream of hot air that flows upward through fireproof skirt.

was established in 1783 by French brothers named Montgolfier who experimented with a "fire balloon." They inflated a 105-foot linen globe over a fire fed with chopped straw. It rose, floated for ten minutes and sparked the interest of a Parisian physicist, J. A. C. Charles. He in turn built a 13-footer and filled it with hydrogen. This balloon went 15 miles but came to a sad end: peasants in the landing area were so terrified they tore it to pieces.

Another Frenchman, Rozier, made the first human ascent, although he roped his gondola to the ground. He simply suspended a flaming brazier under the balloon and bobbed on top of the heat. But hefting sufficient wood or coal plus the hazards of flying a mammoth aerial torch pretty well established lighter-than-air gas as the most feasible lofting agent.

## Nylon Gave Strength

When Ed Yost, now a Raven Industries vice president, resuscitated the idea of hot-air ballooning in some naval experiments several years ago, "we were really starting out cold," he recalls. "In addition to a safe technique for creating hot air aloft, we had to develop a bag that would combine strength and resistance to the temperatures involved. In four years, we went through 15 materials before finally settling on a fabric of nylon, with a thin outside coating of plastic; the latter's function was to reduce the escape of air through the skin.

"Nylon has more than lived up to expectations. Besides being compact and easy to transport, it's tough enough to stand dozens of landings. This is important because we wanted a balloon that could be used over and over again." Mending is simple. "If the fabric tears in landing, you merely patch it like a shirt.

"Unlike the older gas balloons, where a pinhole is almost disastrous, Vulcoon doesn't require taping over the stitching. The gore design is computed mathematically using analog computer methods to realize a shape that has no horizontal or across-the-seam stresses. All stress in the balloon skin is in the vertical direction; the nylon fabric carries the whole load."

Ed Yost himself made the first two flights in a Vulcoon, went as high as 10,000 feet at 1,000 feet a minute. He also showed that simply by throwing open the gas jets, he could stop an almost free-fall descent within 300 feet.

The original one-man version, which the Navy used to train high-altitude balloon pilots, is today bolstered by the X-50 three-man unit. Both are now serving in heavy load transportation and booster and space vehicle recovery studies. For recovery applications, Yost explains, the balloon will be used like a parachute, then heated up so a controlled landing can be made.

Some idea of the lift possible is indicated by Raven's estimate that a Vulcoon of 3,000,000-cubic-foot capacity could transport a 25- to 30-ton load. It could be towed to a destination, landed by remote control, then later be used again.

Current design studies are aimed at shaping the hot-air balloon so that captive Vulcoons will stay aloft in strong winds. After the shaped captive, the next step would be a fully powered, self-propelled hot-air airship —a particularly attractive idea, Yost says, because there would be no problems of gas supply nor any need to keep the balloon inflated between uses.

Other Raven balloons are widely used for such jobs as lifting scientific equipment. Relatively small ones will take payloads to 100,000 feet—payloads whose jobs range from measuring ozone in the atmosphere to monitoring the flow of cosmic radiation from outer space. Large balloons can carry such equipment as telescopes and Geiger counters to altitudes of 145,000 feet. Here as elsewhere, a prime advantage is that balloon systems provide low-cost exposure in near-space conditions for lengthy periods.

## Two Sports Models

Two sizes of Vulcoons are available to civilian-sportsmen. The S-40, whose nylon bag has a 30,000-cubic-foot volume, is a one-man rig. It will fly four hours, go up to 10,000 feet and burn about $2 worth of propane gas an hour. It costs $3,500, ready-to-fly. The S-45, a two-man model, costs $5,000.

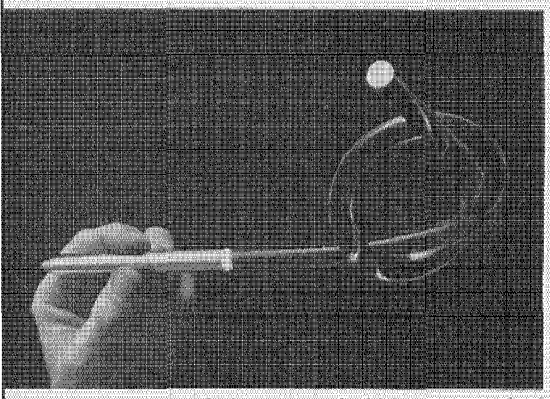
"Because Vulcoons are as expensive as the family car, we don't expect to put one in everybody's garage," grins Raven's Don Piccard. "But the Vulcoon is tough and durable and can readily be used by a group.

"It's not difficult to move: the nylon bag weighs 80 pounds, the gondola about 250. If necessary, two men can inflate it in about ten minutes. They do this with a 300-pound blower that first fills the balloon with air a little warmer than the atmosphere.

"As soon as the balloon begins to ease off the ground, the pilot merely swings the in-flight burner into place, lights up, and in minutes, one more sportsman is sailing the Vulcoon." ■

# Piped Light Pyro

*Capitalizing on the optical properties of "Lucite", a large depar*



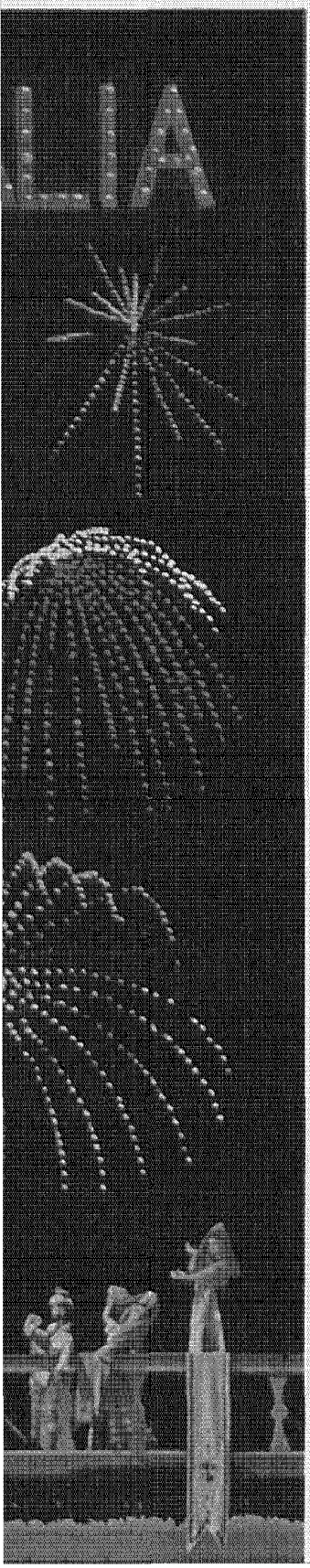
Principle of piping: light enters a rod of "Lucite", travels its length and pours out the opposite end. No light leaks along the way, even when rod is twisted like a pretzel.




Life-size figures indicate display's scale. Behind each skyrocket, bundles of plastic rods, far right, lead from powerful lamps whose light continually changes color.

# echnics

*ore staged indoor fireworks*



For three weeks, thousands of shoppers bustling into the seven-story Grand Court of John Wanamaker, Philadelphia, were stopped cold by a fiery sight: the famous department store was apparently exploding skyrockets indoors.

One entire end of the great hall was showered with endlessly changing rocket bursts and sprays of color 50 feet high. Even more astonishing than the lifelike effect (enhanced by a stereophonic sound system) was the fact that behind the entire pyrotechnic display lay only 12 modest-size lamp bulbs. An ingenious electronic assembly produced the showering colors simply by piping the bulbs' light through 30,000 feet of solid rods of "Lucite" acrylic resin.

As the photo, far left, demonstrates, "Lucite" transmits light much as a hose conducts water, and it does so over substantial distances without hazing or fading. Light from the bulbs behind the Wanamaker display thus entered the hidden ends of the rods, traveled their full length, then poured out of the visible ends of the rods in thousands of pin points of color.

The 36- by 50-foot plastic pyrotechnics were the focal point of a symbolic Italian festival conceived by sales promotion manager Fred Yost. The festival set a gala tone for a three-week sale of imported Italian merchandise ranging from apparel and home furnishings to gourmet foods and art.

"While we combed the Italian market for interesting and unusual sale items, we also searched for a fresh motif, some new way to symbolize Italy," recalls Yost. "We learned that fireworks are traditional at festivals and celebrations in almost every Italian town, large and small."

But how do you explode fireworks indoors? The answer came when Yost joined forces with Mobilcolor, Inc., a New York designer and builder of patterned-light signs and exhibits. For several years, Mobilcolor had experimented with ways to achieve intriguing color patterns; one way was to pipe light through "Lucite".

The light-transmitting properties of "Lucite" have been used in countless ways for many years. The material's resistance to degradation by moisture and sunlight, plus high-impact strength and dimensional stability, have made it a popular choice for outdoor commercial signs. Automobile manufacturers capitalize on its optics and strength by making taillights of "Lucite". Architects and builders have combined flat, corrugated or patterned sheets of "Lucite" with natural or fluorescent lighting to illuminate factories, offices, schools and motels.



But a skyrocket is something else again, and the optical properties of "Lucite" were never more vividly demonstrated than by the Wanamaker fireworks, contends Bernard Block of Mobilcolor. "Display builders have dabbled with piped light and other materials for 25 or 30 years, but never on a very large scale," he says.

"However, we've always been intrigued by tests in our laboratories which showed that the optical properties of 'Lucite' permit efficient light transmission up to some 25 feet. What's more, 'Lucite' can be bent or curved in any direction and still do the job so long as the radius of the curves remains at least twice the thickness of the plastic."

## Recipe for Rockets

Because the Wanamaker exhibit was the first attempt at large, animated effects with piped light, the skyrockets were almost one year in the making. "We had to order more than 4,000 extruded plastic rods with one-quarter and three-eighth-inch diameters, and cut them into lengths from 2½ to 20 feet," recalls Block. "Then we spent months perfecting the electronic control system to get the proper bursting sequence."

Each of the seven skyrockets was formed by first bundling the hidden ends of the rods, extruded by Anchor Plastics, Inc., Long Island City, N.Y., in front of the light sources. The tube ends that would be visible to shoppers were then inserted through a black, metal and plywood backdrop.

Lighting the skyrockets from behind the backdrop were a dozen 300-watt bulbs. The complex electronic assembly conceived by Mobilcolor directed light into the proper rods, producing the spectacular, cascading effects of bursting, spraying and fading.

"The changing light and color patterns provided an almost infinite variety of effects," says Yost. "You could watch the skyrockets for hours and never be aware of repetition. Without a doubt, Festa d' Italia was one of the most successful promotions staged in the history of John Wanamaker."

Every bit as pleased is Block of Mobilcolor. Says he: "The fireworks' striking realism proves conclusively that piped light now offers exciting possibilities for displays and signs of all kinds. And we're getting quite a playback from businessmen who saw the skyrockets and wondered what piped light could bring to their sales promotions or trade show exhibits." ■



Dr. Reeder

*Just trying to get the facts, we asked a Du Pont economist*

# Economic Growth

A whimsical tune called "The Churkendoose," popularized several years back by Ray Bolger, described the trials of a doughty little bird who was part chicken, part turkey, part duck and goose. Roundly abused by his fellow fowl, who bombarded him with drastic remedies for his condition, the Churkendoose was philosophical. He admitted that his parts, considered separately, were open to criticism. But taken as a whole, he felt his impact was quite pleasing.

Comparing the Churkendoose's case to the debate on U.S. economic growth is not too farfetched. Because of the cold war, in which economics plays such an important role, and the persistence of unemployment —even though more people are employed than ever before—many observers have concluded that something drastic must be done about our economy. Fears are expressed that our growth rate is slowing down, that we are unable to expand our output of goods and services as fast today as we did a few years ago, and that the present U.S. growth rate compares unfavorably with that of many Western European countries, Japan and the Soviet Union.

However, as in the Churkendoose's case, it depends on how you look at things.

If you focus on short-term phenomena, the U.S. growth rate can be made to appear faulty and inadequate. Viewed in perspective, its portrait is much more attractive.

In simplest terms, a growth rate is a number which expresses the average annual percentage increase in any sequence of figures. It's a useful concept because it condenses into a single figure the fluctuations of many individual years.

Growth rates can be calculated for long periods or short ones. "Long-term" is not a certain number of years but rather a period long enough so that specific short-term events such as booms and recessions do not distort the calculations.

Generally speaking, 30 years is long enough to iron out short-term influences, although even more confidence can be placed in growth rates that cover 40, 50 or more years. During the past 30 years, for example, our economy was buffeted by a major depression, a major war, Korea and a huge postwar boom.

The best single measure of total economic activity in the country is the Gross National Product, or GNP. This is the dollar value of all goods and services produced in a year. In 1962, this value was $554 billion.

Since GNP is affected by rising prices, historical figures must be corrected for changes in the price level if valid comparisons and calculations are to be made. To do this, all past GNP figures are converted into the prices of one specific year, i.e., into constant prices.

When this is done and a growth rate calculated from 1900 through 1962, we find that the U.S. economy has been growing 3.1 per cent per year* since the turn of the century. The trend line representing this rate is shown on the chart, right, along with the GNP values for each year.

## Year-to-Year Growth Fluctuates

It is interesting to note that in only a few years does GNP increase by precisely 3.1 per cent. The characteristic year-to-year pattern is quite erratic. In recent years, for example, annual gains of 5 per cent or more have occurred (1955, 1959, 1962); in other years, the gains have been less than 3 per cent (1956, 1960, 1961); and in other years, actual declines in GNP have taken place (1954, 1958).

Under this fluctuating pattern, however, lies the basic growth rate of 3.1 per cent. This shows what we have been capable of sustaining over a period as long as 60 years.

Growth rates for short periods of time must be viewed with considerable caution. The calculations may be entirely accurate, but one must be careful when interpreting the figures. It's doubtful whether a useful growth rate can be determined from a period as short as five, seven or even ten years. Sometimes the addition of one more year may change the calculation significantly and alter a previous interpretation. Example: The growth rate of GNP betwee 1957 and 1961 was 2.8 per cent—a figur below the long-term rate. But when 196 with its 5.4 per cent gain is added, the 195 to 1962 growth rate becomes 3.2 per cent— a figure above the long-term rate.

Well, then, where does the fear about ou slowing growth rate come from?

It originated by splitting the entire post World War II period into two parts an comparing their respective growth rates.

The growth rate for the first period, 194 to 1955, was a stunning 4.3 per cent pe year; but for the second period, from 195 to the present—when "the present" ende with 1961—it dropped to a dismal 2.3 pe cent. Even when "the present" include 1962, the growth rate from 1955 to 196 is only 2.6 per cent. There is no questio but that recent growth has been slower tha it was in the early postwar period.

But is this significant? Should anyon have expected anything else?

After all, at the end of World War I there was a tremendous shortage of con sumer goods, housing, industrial capacity roads, schools, etc. On top of this, th Korean War required huge military expend itures in the early 1950's. A sharp rise i output—and thereby in our short-tern growth rate — was logical throughout thi period. And just as logical was a slowing i our rate of growth after the most urgen needs were met.

The turning point in our postwar patter of growth was reached sometime in th mid-1950's. Since then, the economy has in effect, been "on its own"—without th temporary stimuli of the earlier period. W have had to depend for growth largely upo the production of new and improved good and services for our expanding population These conditions have resulted in our cur rent growth rate (1955 to 1962) of 2.( per cent.

How does our current growth compar with that of other nations?

The available statistics suggest that ou growth since the mid-1950's has been slow er than that of many other nations. Bu

**This growth rate, and all others that follow, are derived from the slope of a trend line fitted to all the years involved.*

# HOW FAST IS FAST?

By Dr. Charles B. Reeder

growth *rates* tell only part of the story. They don't indicate the *amount* of growth in absolute terms. For example, a gain of 2.6 per cent in our 1962 GNP of $554 billion would represent an absolute increase of nearly $15 billion. A $15 billion gain in a $220 billion economy (such as Russia's) would represent an increase of more than 7 per cent. So we need not apologize for lower growth *rates* which represent such vast absolute amounts.

It's also important, I think, to realize that most of the rapidly growing European economies only began to expand significantly in the mid-1950's. Prior to that time they were recovering—with our aid—from the destruction of World War II. They were creating the base for their subsequent industrial growth. Thus, they followed the U.S. with their era of rapid postwar growth, and today their growth is beginning to slow down—just as ours did in the mid-1950's.

## The Objective of Growth

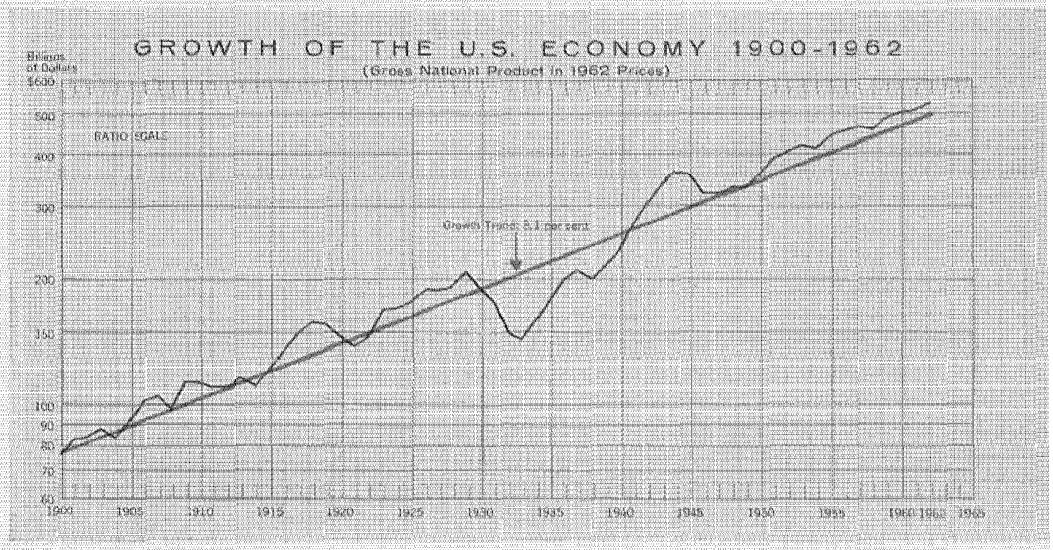
What is the ultimate objective of economic growth? It should be to boost the standard of living enjoyed by consumers—to multiply the output of goods and services that people want and are willing to pay for.

Some who argue for an acceleration in our growth rate seem to see growth for growth's sake as the objective of U.S. economic policy. A higher rate would be desirable, but only if it's soundly achieved. Increased growth which comes about by the Federal Government simply enlarging its sector of GNP by more spending for defense, space or public works will do little to increase the flow of goods and services to consumers.

On the other hand, a higher growth rate brought on by the expansion of private investment and the production of goods for the marketplace will benefit all consumers. Historically, we have experienced our highest rate of growth during periods of high investment. During the 1947 to 1955 period, for example, private investment accounted for 15 per cent of GNP, whereas in the depressed 1930's, only 7 per cent of GNP was devoted to investment.

A higher rate of investment can be encouraged by enlightened tax and depreciation policies, as well as by a positive attitude of government toward business and its ever-changing problems.

A soundly based increase in our growth rate will be hard to achieve quickly. If we were growing only around 2.0 per cent per year, improvement in the rate would be easier to come by. But as we approach our long-term rate, further gains for any sustained period become extremely difficult.




For one thing, we desire as a nation to take some of the benefits of our rising productivity in a form that tends to hold down the *statistics* of growth; that is, we want more leisure time. There is no GNP equivalent for the 19-hour reduction in the work week in manufacturing since 1900, nor for the longer vacations that Americans are enjoying in increasing numbers. As long as such trends prevail, the rate at which GNP can grow is held down, although our standard of living rises.

The need for faster growth is often linked to the unemployment problem. Faster economic growth should result in more jobs, and, therefore, reduce the number who are out of work.

To some extent, of course, this is true. But here again, we should not overlook some hard facts that will not yield to the glamour of a higher growth rate. Many of those who are out of work are persons without skills or sufficient education to qualify for jobs in a complex industrial society. More than two-thirds of the unemployed have not finished high school.

The nature of work has changed drastically in recent years, away from unskilled manual labor and toward jobs requiring skills and training. There's no assurance that a higher growth rate will create openings for many of the presently untrained and unskilled unemployed; it may only intensify the demand for skilled and educated men and women. This aspect of the unemployment problem requires special attention, such as programs to retrain and to relocate the jobless. It will not be solved by simply demanding faster growth.

In sum, the U.S. economy *is* growing, not as fast as in the early postwar period, but not far below the rate that has produced our present high standard of living. While we never should be satisfied with our growth rate, neither should we unnecessarily bewail our performance nor look for an easy road to more rapid growth. It doesn't exist. ■



# Mr. Leeds' Magic Carpe

*His enthusiasm for nylon makes him sound more like a carpet salesman than the hotel executive he is*

Although he looks poised for a magic carpet departure, Robert Leeds, above, needn't travel to reach a place of Arabian Nights-like splendor.

His home is the Chalfonte-Haddon Hall in Atlantic City, the largest resort hotel in the world, with facilities for almost every type of recreational activity. A vice president of Leeds and Lippincott Co., he carries on a tradition of family owner-management that began in 1890.

One distinguished vacationer has described the Chalfonte-Haddon Hall as the first wonder in the wonder world of Atlantic City. Its program ranges from Audubon and wildlife expeditions (Leeds is a devoted birdwatcher) to water ski instruction (Leeds was an avid water skier). Winter activities include gunning for pheasant, quail and salt-water fowl on a 1,500-acre preserve.

The hotel is famous for three special winter party weekends, during which top ente tainers and elaborately authentic settin transport guests to the Caribbean (Calyps music, native dancers) or the Left Bank (th cancan and le jazz hot) or the South Pacif (grass-skirted dancers and a luau prepare by Polynesian chefs).

"I've been told by guests who know th Caribbean islands well that our weeken seems more real than the real thing," Lee says with a smile.

Such weekends notwithstanding, the Ha don Hall maintains an atmosphere appr priate to its place as the grande dame of A lantic City hotels. Its rich décor is related t that of the original Haddon Hall, built i 1068 as the home of William the Conquero

In his choice of fabrics for the hotel's fu nishings, however, Robert Leeds is no trad tionalist. He keeps a hawklike watch fo new materials that offer longer wear an

easier maintenance without sacrificing the esthetic appeal of older ones.

When one of the first nylon carpets was shown in a Du Pont exhibit, he noted it. At that time, carpetmakers had had limited experience with nylon in the special constructions needed to withstand heavy wear in a hotel. Leeds, however, became convinced that the tough fiber would be ideal for hotel use. He went to Ralph Hedger of Hardwick and Magee, a company with long experience in the field of commercial carpeting.

They agreed that the success of nylon would depend largely on such construction factors as density of the pile, the weave, the length of the pile fiber, the color and the ability of pattern to hide soil.

Seven years ago, the hotel's first carpet of Du Pont nylon was installed in the Wedgwood Room, the main dining room at Haddon Hall.

"We paid $1,900 more than the equivalent quality in wool would have cost, but it was worth it," Leeds says. By now, he explains, the wool carpet would have had to be replaced. Cost: $17,000. The nylon carpet still doesn't show spillage or unusual wear around food collection stations or at the entrance to the kitchen. Yet the spacious room is in use 14 hours a day. About 600 meals can be served at one sitting.

Nylon carpet also is less expensive to maintain, Leeds points out. "Wool carpet should be shampooed every two months, although it usually isn't. We find that nylon carpet cleans easily and does not require as frequent shampooing."

When Leeds first became interested in nylon carpet, only two major mills were offering a commercial grade. Today there are 11, and the choice of colors and designs is far broader than before. Mills also often work with architects and interior designers on custom designs.

By 1970, Leeds predicts, nylon will be the majority preference when carpet is specified for commercial buildings. Almost every year since 1956, he has added a major nylon installation. The Peacock Inn, a combination cocktail lounge and dining room, has had a cut-pile Wilton, geometrically patterned in shades of burgundy, since 1957. The Chalfonte dining room has one that's multicolored and contemporary in design. Leeds is well pleased, too, with a loop pile, tweed-patterned Du Pont "501" carpet by Bigelow-Sanford that serves in a small meeting room. It effectively endures the expected punishment of a resort hotel — frolicking children, spilled drinks and spike-heeled shoes. (Carelessly dropped cigarettes, though, are any carpet's greatest enemy, Leeds says.)

Just a year ago, he installed nylon carpet in the main elevator bank; this is generally considered the critical test of any floor-covering material because of the "pivot-turn" type of foot traffic. Leeds is well pleased with the durability to date and reports that once-a-day vacuuming is enough to keep it looking fresh.

Unquestionably, the most striking of Leeds' nylon carpets are in the main lobby of Haddon Hall. A series of cut-pile area rugs by Hardwick and Magee, their design is heroic, their colors clear and intense.

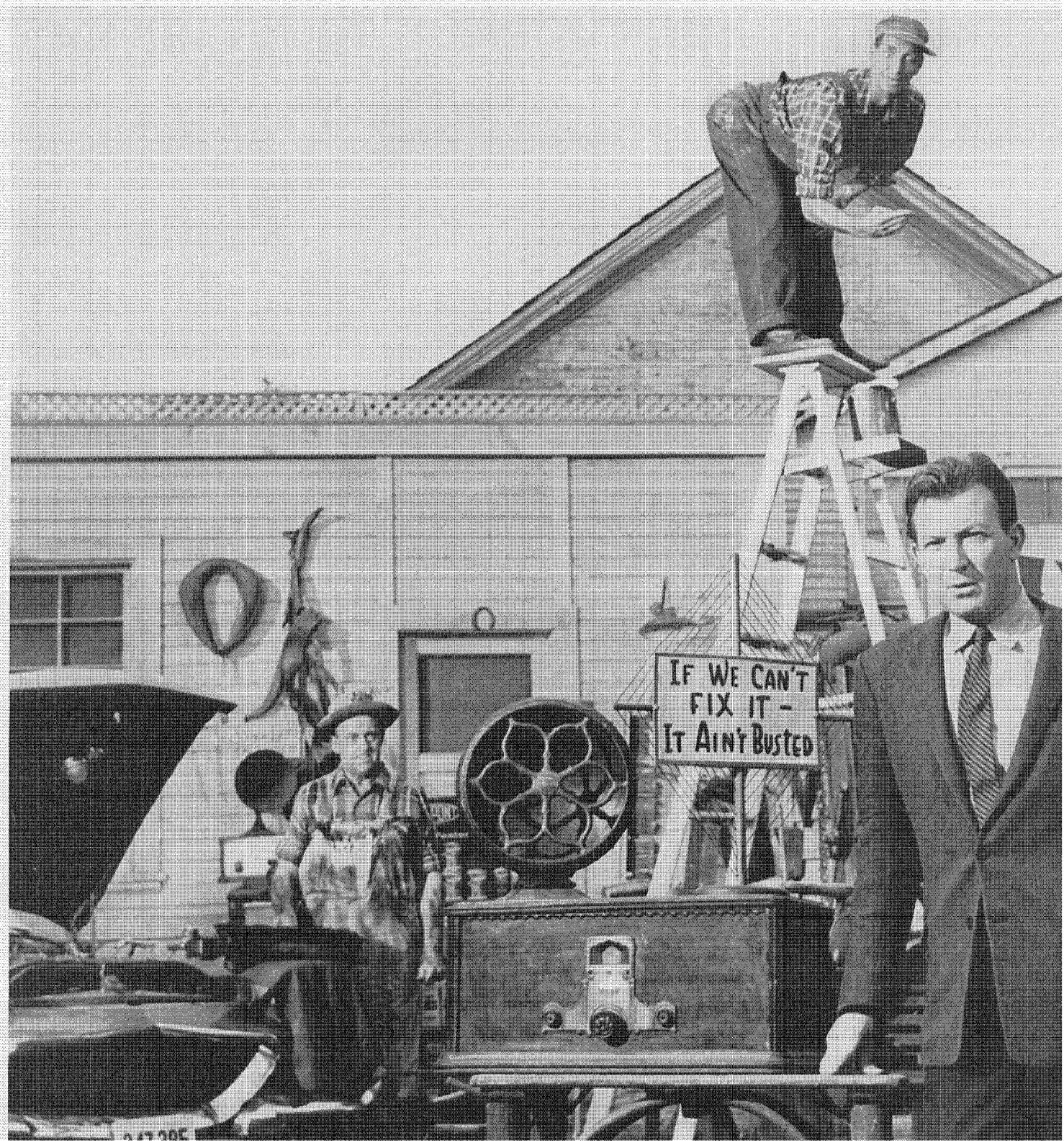
Is there anything magic about such a nylon carpet? Perhaps not, but, in the words of Robert Leeds, "I'm convinced that its performance is pretty wonderful." ■



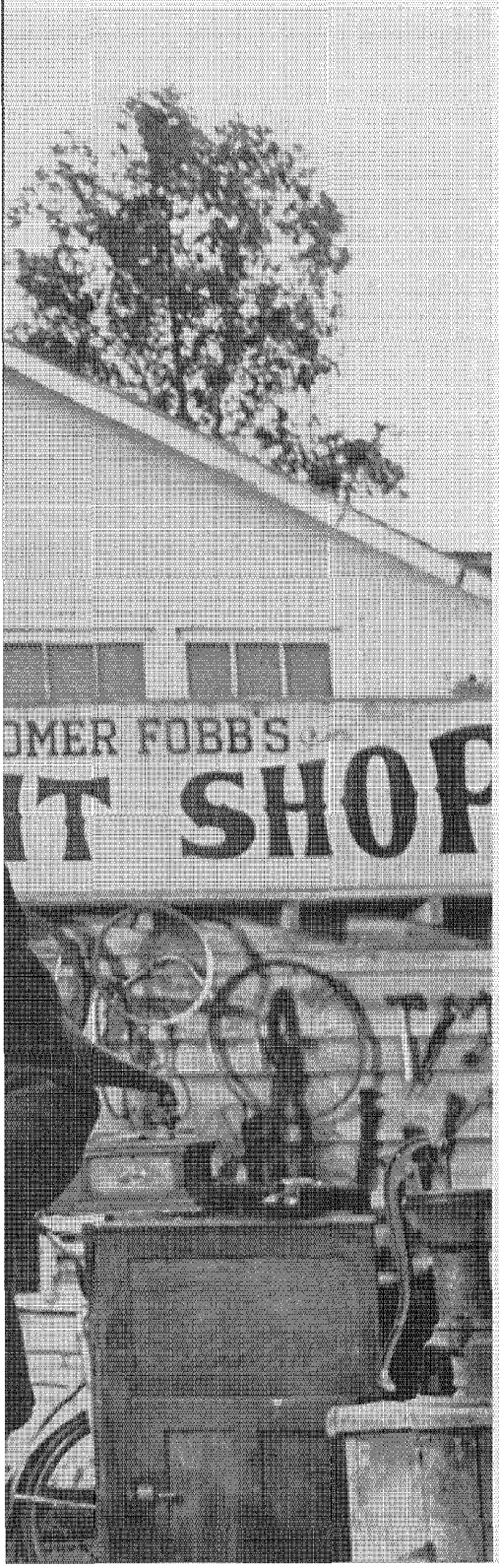
Seven years after installation, nylon carpeting in Wedgwood Room shows no spillage or signs of unusual wear around food collection stations or at the entrance to the kitchen.

*The 50 products known as No. "7" Automotive Specialties find a townful of good-will ambassadors when they go*

# DOWN HOM



# WITH HERB




Hidden somewhere off the main road in Indiana is America's most unpredictable little town. It has no high school but is building a college. Its biggest celebration of recent years was the dedication of the speed trap. The postmaster not only reads your mail, he answers it.

The village is Hometown, and the only man who knows its precise location is Herb Shriner. For 20 years the whimsical Hoosier humorist has kept the outside world agog with verbal reports of goings-on down home; now for the first time he's going to give televiewers a firsthand peek. To Hometown he took camera crews to film the village's leading citizens using the Du Pont "7" line of Automotive Specialties. And the result, says sales manager C. A. Weslager, is "the most entertaining and, we think, effective series of commercials ever done on our line of engine and car-care products."

This is a mouthful because the No. "7" line and its advertising support for dealers are almost as old as America's mass rush to the automobile. In 1923, Du Pont introduced "Duco" finishes to the auto industry, ending the traditional painting bottleneck of some 26 days per car. Shortly thereafter, to care for the new finishes, Du Pont introduced No. "7" Auto Polish, still the line's sales leader. Today it's accompanied by 49 other specialties ranging from No. "7" Wax Wash and New Car Wax to cooling system cleansers, sealers, sponges and "Slipspray" dry lubricant.

The Shriner commercials will be seen 19 times this spring and summer on Du Pont Show of the Week (NBC, Sundays, 10 p.m.). If the films are unique, they mirror Herb Shriner's Hometown. That village, you may recall, has a newspaper but doesn't need it. "In a small town, you know what everybody is doing. But you buy the paper every now and then to see if they got caught at it."

Hometown has no banks: "Whenever anybody saved up any money, they'd use it to leave town." Town unity can be shattered by such simple decisions as what colors to put in the town's new traffic light. (Actually, they decided to drop red; then, strangers wouldn't stop on their way through.)

*continued*




Mayor Plink finds Du Pont No. "7" Auto Polish makes a shine so deep that it replies to a shout.




Homer Fobb and aide can fix anything, but prefer to lose the sludge business to M.O.A.



Football coach Crumpacker pitches out No. "7" Wax Wash to team aspirant. As he washes her car, he's supposed to observe suds' spread formation.

The town's eminent persons are the soft salesmen for No. "7". Shriner and his cameramen eavesdrop, for example, upon Mayor Plink and a sideman from the Dog Catcher's Band. The Mayor takes meticulous care of his car, doesn't even let the town see it except at civic events like the condemning of the horse trough. He's wild about the shine he gets from No. "7" Auto Polish. "Why," he exclaims, "it makes a shine so deep I'm almost scared to look down." Tentatively, he does peer into the radiant hood and cries, "Hello down there!"

Back comes the echo: "Hello yourself."

There's Homer Fobb, whose Fix-It Shop's motto is, "If we can't fix it, it ain't busted." The camera has caught Homer at a bad time: he's painted a 20-foot ladder from the bottom up and he's trapped on the top rung. "Been up there three days," Shriner drily reports.

But Homer's helper is removing gobs of sludge from an auto engine — a tragedy, Homer avers, that could have been averted if the owner had used Du Pont Motor Oil Additive: M.O.A. prevents sludge and clogging, unnecessary engine wear and big repair bills. Taking a last look at Homer selling from his ladder, Shriner says, "And Homer's nobody's fool—nobody's we know of, anyways."

No. "7" Wax Wash, introduced last year, evokes some of Shriner's cheeriest whimsy. Ordinarily, when Justice of the Peace Elroy Fripp marries folks, he gives them trading stamps. To the eager pair in the Du Pont commercial, however, he reports a policy change: now he's going to give free car washes — and he proceeds to demonstrate the ease of using Wax Wash. Only after prodding does he stop admiring his work, turn to the couple and say, "We are gathered here . . ." Whereupon Shriner explains that the couple you're seeing has already been married three times. "It's such a small town that they just keep gettin' introduced."

Another salesman is Miss Crumpacker, the town's elderly English teacher and football coach. Using her ruler on his head, she gave Shriner the highest marks in his class.

In a town where "you don't have to kill time, it just dies a natural death," Shriner and cameras fortunately drop in on a day of unusual excitement: the radiator in one feller's car is boiling over and folks haven't been so riled up since the Fire House burned.

It's obvious that the old codgers are glad it happened. But they point out sagely that the boil-over needn't have occurred. If driver had had horse sense, he could h prevented trouble by installing Du Pont "7" Anti-Rust and Cooling System Clean

Such waggery, coupled with the sale products to maintain cars, fits right in v Shriner's hobbies and passions. Ev Hoosier, he says, is a car nut, although himself may be a little further gone t most. An antique car finder and restorer has six), Shriner drives a 1936 Cord, m in Auburn, Ind.; one of his projects Hoosier museum for the cars born in state. Some years ago, Shriner also or nated what is now known as the Ann International Auto Show, held in N York; he also published a sports car ma zine called *Motor America*.

## Hoosier from Ohio

Some say Herb Shriner invented India This he denies: he was born in Ohio. N urally, his parents "moved to Indiana soon as they found out about it." That at age four; almost immediately he begar develop the personality described as m contagious than chicken pox in a crow classroom. When a charmed neighbor on paper route made him a present of a h monica, the instrument started a career: became an entertainer, touring the U "playing fairs, square dances and swa fires." Gradually, he became a humor "I had to put jokes between songs to m people listen to the harmonica."

People who saw his Broadway hit "Ins USA" or who have heard his radio and monologues feel the jokes now wag the h monica. Actually, Shriner travels thousa of miles annually organizing harmon bands for such groups as Boys Clubs America; he's played with symphonies a toured with his concert program, "P Americana." He began collecting and cording folk music long before its pres rage, is in continuous demand as a lectu and speaker on Americana.

When he first became a USA crisscross he and wife Pixie fancied a bus-sized la cruiser, the Wanderlust. Today he flies Big Tin Bird, a converted Navy PBY h uried up with shower, beds and deepfree Ever since a friend, Commander Anders took him for a cruise on the *Nautilus* pr to the historic transpolar voyage, Shri has been hooked on submarines, plans acquire one if he "can get a good buy." T should mesh with two other hobbies, r combing and underwater photography.

Shriner once observed that nobody in Hometown had much get-up-and-go; wh you got up, there wasn't any place to go.

But if Hometown lacks vigor, the likeli explanation is that Herb Shriner walked with the town's entire supply.

# Taking the Heat off Industry

How are U.S. manufacturers meeting today's pressure to make products better, faster and more economically?

After studying 952 new industrial plants, *Factory* magazine reported these among trends to watch:

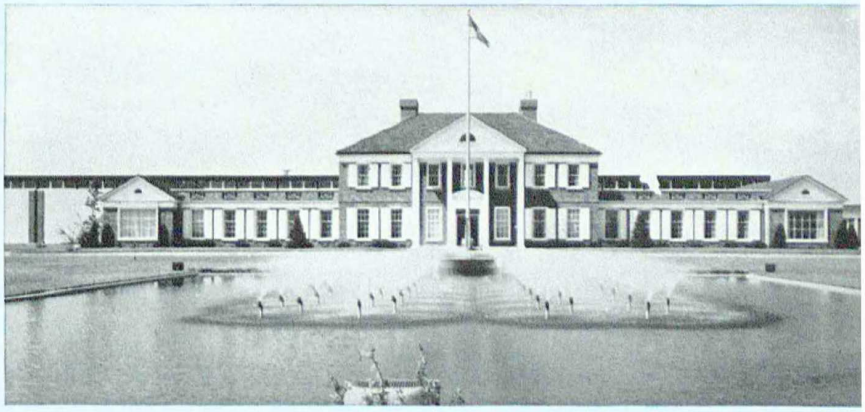
1. Control of the environment in which products are made is becoming more stringent.
2. More attention is paid to employee comfort.

Air conditioning has a major role in meeting both objectives. Offices in all ten of the plants that *Factory* cited as tops in 1962 are air conditioned, as are most restrooms and lunchrooms. Several of these plants also make extensive use of air conditioning in production areas, for reasons as varied as the industries they represent. For instance:

"When your plant is only 200 yards from the Pacific Ocean, you don't install air conditioning primarily for comfort," says E. Douglas Reddan, president of Infrared Industries, Inc., of Santa Barbara, Calif. "But the same breezes that would keep us cool also would bring us moisture and sea air contaminants. These are enemies of components for the sensitive instruments we develop and manufacture. That's why we decided to air condition our new plant completely. At the same time, we are very happy to give our employees a custom environment to go with the custom work we do." IR's 80,000 square-foot building is air conditioned with Trane Co. equipment charged with Du Pont "Freon-22" refrigerant. "Freon" refrigerants are used in most air conditioning systems because of their safe, trouble-free performance. Equipment installed by Weatherite Co.



"Cleanliness is essential to our marketing philosophy and air conditioning is essential to cleanliness," says Edward W. Jochim, vice president of Personal Products Corp., which makes feminine sanitary products. With its columned veranda and graceful Georgian architecture, the company's new Wilmington, Ill., office building looks like a southern colonial mansion. Both it and the contemporary-style manufacturing building are air conditioned throughout for employee comfort and improved product quality. In the office building, air is distributed through small slots in a dropped ceiling so that workers enjoy draft-free comfort. In the process-packaging area, the system by Worthington Corp. uses a chilled water spray to control temperature and humidity and clean all fresh air as it enters. "Freon" is the refrigerant. Equipment installed by McCarty Brothers.



"Since the consolidation of our East Coast manufacturing and storage facilities here, we have increased production eight per cent while cutting operating costs," reports John E. Dowden, manager of the new Yardley of London, Inc., plant at Totowa, N. J. "At our old plant, it was often too hot to run Brillantine hair preparation, which must cool to a thick, even consistency. Our packaging efficiency sagged during hot weather, too. Now, with controlled conditions, our machines and processes run smoothly and worker output is consistently high." Over-all cost of the new plant was only $11.60 per square foot, yet this included a lavish employee entrance with live hanging gardens, right. Most offices and manufacturing areas are air conditioned with a Trane Co. system charged with "Freon-22". Equipment installed by The Frank A. McBride Co.



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