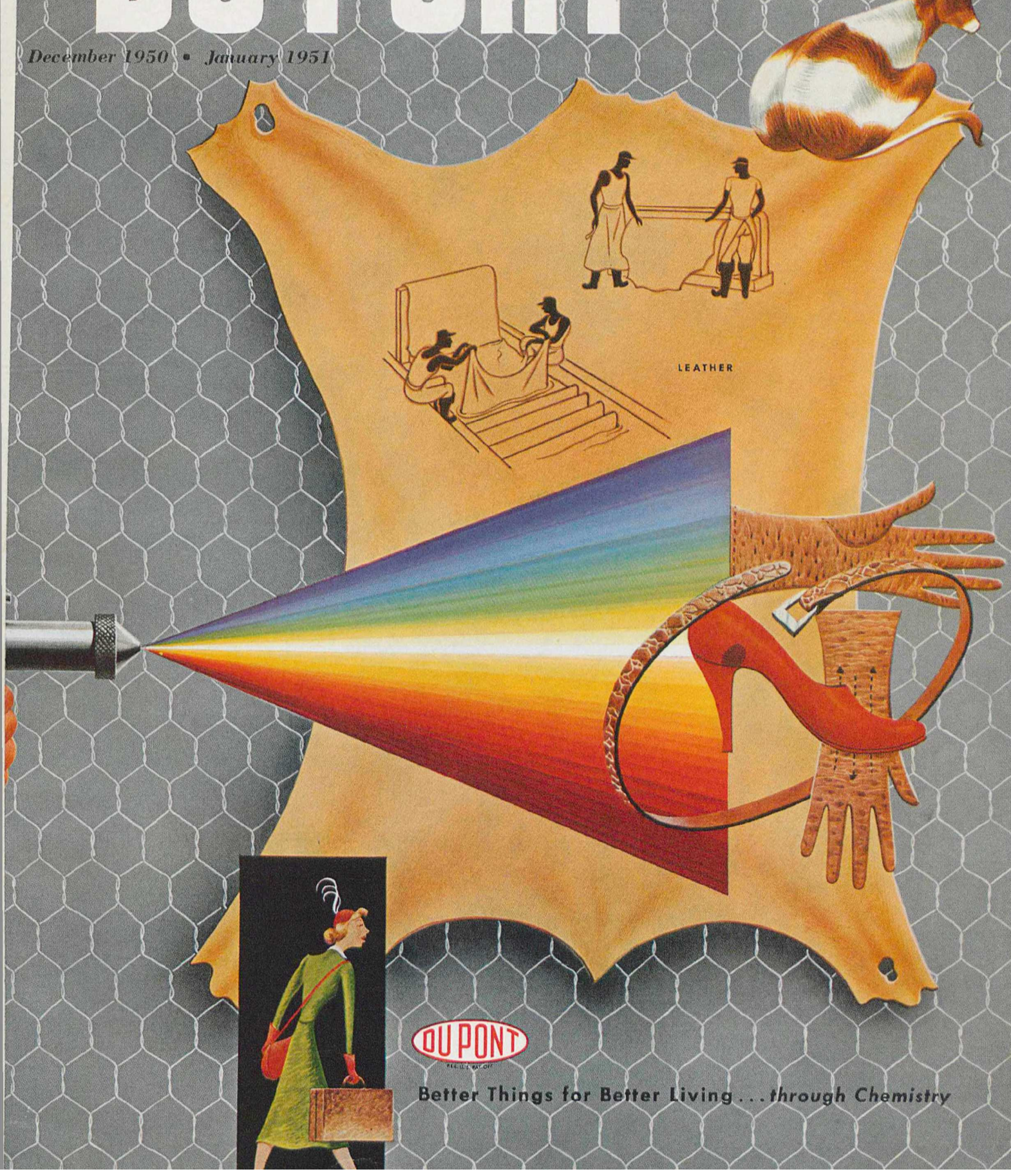


December 1950 • January 1951



Better Things for Better Living... through Chemistry



There's quality in

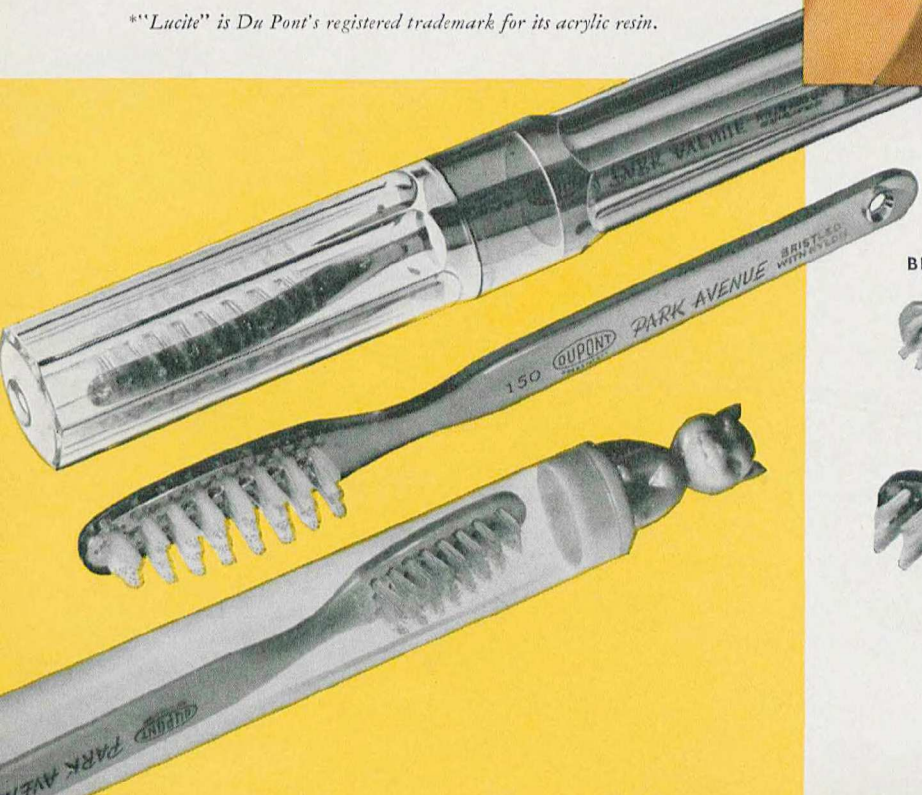
Du Pont Tooth Brushes

Du Pont research . . . the research that brought you nylon . . . has made possible quality tooth brushes . . . for Du Pont Tooth Brushes have bristles made of nylon. They stay clean, fresh and resilient and they last a long, long time.

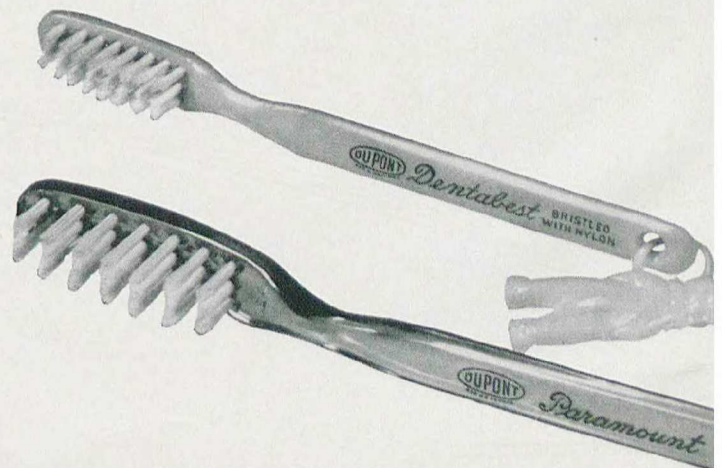
Research has gone into the design of these tooth brushes . . . skill into their making. There is a color, size and style to please every member of the family. Handles are made of Du Pont "Lucite"*, nylon and other plastics.

You can buy Du Pont Tooth Brushes wherever tooth brushes are sold, at 10¢ to 47¢ each.

*"Lucite" is Du Pont's registered trademark for its acrylic resin.



BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



Send-off for "Orlon"

The following are excerpts from a speech made by Crawford H. Greenewalt, president of Du Pont, at the recent dedication of the Company's \$20,000,000 "Orlon" acrylic fiber plant outside of Camden, S. C.

"Of late years," Greenewalt observed, "big companies have been under attack, and Du Pont is admittedly a big company. But I am sure that in 'Orlon' acrylic fiber we have something that could not have been developed by anything else but a big company—big in human resources and big in its ability to take a large financial risk. If the appearance of 'Orlon' on the scene here today is good, then I think we might, without injustice, enter that development on the credit side of the big business argument.

"But if the arrival of 'Orlon' is to be accounted a desirable thing, then its benefits must, of necessity, extend beyond . . . the Du Pont Company. To be sure, Du Pont is hopeful that its investment in time, effort and its stockholders' money will be repaid with suitable interest. But the fact is that Du Pont cannot make a penny's worth of profit out of 'Orlon' unless the textile industry makes a profit as well and unless the customer is pleased enough with the final result to spend his hard-earned dollars."

Greenewalt pointed to the history of the ever-widening benefits of other products of Du Pont research and said, "There is every indication that 'Orlon',

if it is successful at all, will rapidly widen its circle of benefits."

One of the present uses for "Orlon" acrylic fiber is in curtains, and he disclosed that the yarn in a \$15 pair of curtains made of "Orlon" would cost \$2.86.

"The yarn went from Camden to a weaving mill, and from the weaver to a finishing mill, and from the finishing mill to a curtain manufacturer, and thus into the retail trade," he said. "Each intervening step made its own particular contribution, and the wages, purchases, and profits of each made their way into the whole economic pattern."

He spoke of the "profound effect" various synthetic yarns have had upon the American textile industry in recent years, and then pointed out that the synthetic yarns currently account for only 20 per cent of the total consumption of textile fibers. "It is simply a case of broadening the use," he continued. "In 1920, when synthetics were a negligible factor, the average American used about 27 pounds of cotton and wool a year. The last figures I saw indicate that the current rate of consumption is something like 33 pounds a year, in addition to seven pounds of rayon and a pound or two of other fibers.

"I see no conflict here, for I am sure that as the synthetic textile industry grows, the entire textile field will expand along with it."



BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

CONTENTS

JAMES H. McCORMICK, *Editor*

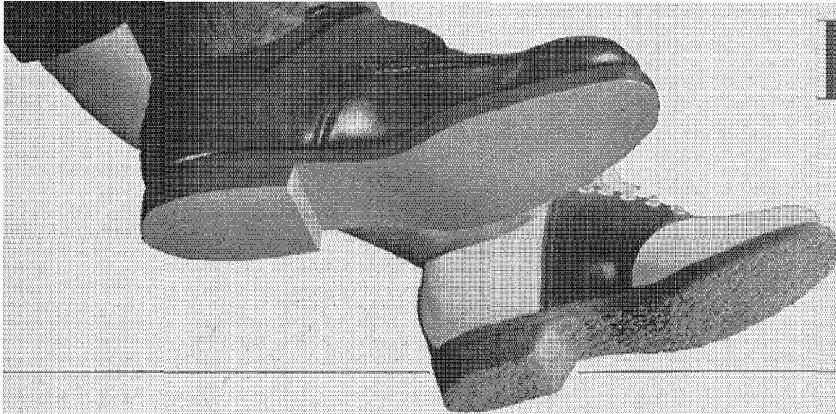
Vol. 44 No. 6

LEATHER'S 7-LEAGUE BOOTS	2
YOU FLY BY COLOR	5
LESS WRINKLE FOR FABRICS	6
NO MORE OF THIS	8
PROTECTION FOR CATS AND CRANES	10
A SELLING APPEARANCE	12
NEW DIET FOR THE SOIL	14
NEWS FOR PUDDLE-JUMPERS	16
WHY THERE'S NOT ENOUGH CELLOPHANE	18
INDUSTRY'S STEPCHILDREN	19
NEOPRENE LEADS A SHELTERING LIFE	22
CHIP OFF THE OLD BLOCK	24
RUBBER NEEDN'T SMELL LIKE IT	26

BOTTLES TO BOBBINS	28
WHAT'S NEW	30
DID YOU KNOW	32
THE BIGGEST BEST SELLER	33

Published and copyrighted 1950 by E. I. du Pont de Nemours & Co. (Inc.), Wilmington, Delaware. All rights reserved. This magazine or parts thereof may not be reproduced in any form without permission in writing from the publisher.

PHOTO CREDITS: Page 5: courtesy United Air Lines; Page 9: courtesy Pacific Telephone and Telegraph Co.; Page 10: courtesy Caterpillar Tractor Co.; Page 14: courtesy *What's New* Magazine; Page 15, bottom: courtesy Seabrook Farms; Page 23, lower left: courtesy USAF Air Materiel Command; Page 33, top: courtesy Time, Inc.



Leather's 7-league boots

Great strides in making better leather products are the result of the chemist's interest in one of the most ancient trades

Unconsciously, we carry a lot of history around on our lips when we talk about leather products. Take the names of shoes, for example. How quickly "moccasin" recalls the days of the American Indian and the leather-stockinged pioneer; "sandal," the ancient Greeks, Romans and Egyptians; "boots," the figures of Sir Walter Raleigh and the Cavaliers.

Just when prehistoric man first used leather for shoes and other garments, nobody knows. But it was a good idea, for leather has many fine properties such as porosity, absorbency, strength and flexibility. These properties, however, aren't fully developed in the skin

as it comes from the animal. A fresh skin or hide is not only unattractive, but it's also a picnic ground for destructive bacteria. That's where the art of leather-making comes in.

For the progress that has made American leather what it is today, we're indebted to many different peoples—from the ancient Hebrews and their invention of oak-bark tanning to our own Indians and their famous "buckskin" tan.

But, until about 150 years ago, no one had made a scientific study of tanning and other processing work. Some of the old cut-and-try methods were good, but not good enough. So scientists, through the years, sought to make improvements. Today they are still at work in university laboratories, in tanneries and in the laboratories of chemical concerns like Du Pont.

High-spotting some of the chemical contributions

At John R. Evans Co. of Camden, N. J., chemicals aid in unhairing skins for shoe leather.





Pickling with mineral acids is a major step in the leather industry. It gets the skins in good condition for tanning.



Your shoe uppers were probably tanned by the chrome process above. Soles, however, are tanned with vegetable extracts.

to better leather, let's look at the main steps in turning raw skins into footwear. Today, this outlet consumes 85 per cent of all leather tanned in this country. Historically speaking, it's also a good starting point. In 1628, shoemakers Thomas Beard and Isack Rickman arrived from England—and to quote from one report, Beard had with him “divers hydes, both for sole and upp leathers, to make upp in boots and shoes.”

Much of our modern shoe leather still has to travel long distances to reach the tanneries. This accounts for the first processing step—soaking. As the tanner gets the salted skins, they are almost as stiff as a board. So they're put into water and the reconditioning is speeded by synthetic wetting agents—first cousins of your household “soapless soaps.” One of these, “Merpel” B wetting assistant, not only saves time

but leaves the skins in better physical condition.

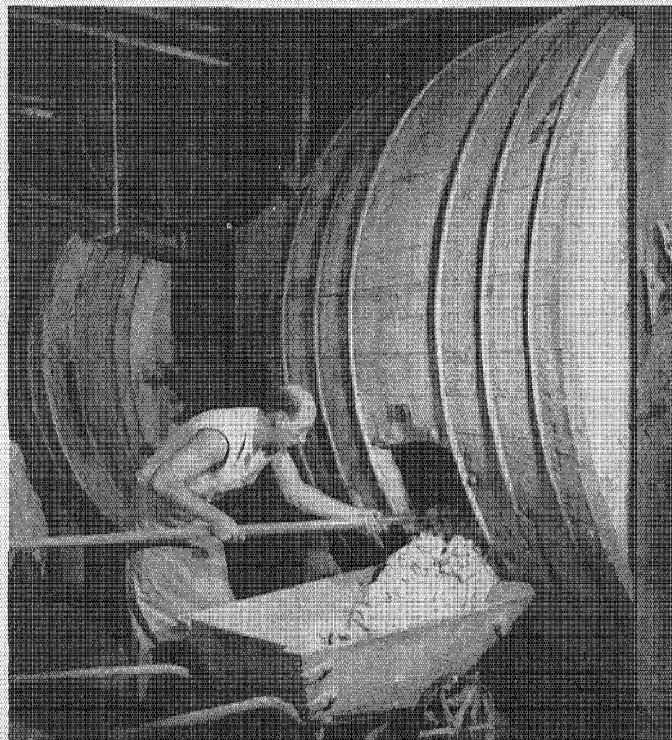
Then comes “unhairing,” which involves a bath in lime water. For this step, the chemist showed that certain compounds, mainly sulfides, when added to the bath, help to get rid of the hair even faster. A fairly recent milestone is “Cyanegg” sodium cyanide, which a Racine, Wisconsin, tanner started buying from the Electrochemicals Department in 1934 for addition to lime solutions. The idea caught on elsewhere. Properly used, sodium cyanide loosens the hair rapidly without damaging it. This is especially important, for the recovery of good hair from the hide of long-haired animals often repays the tanner the cost of unhairing.

After a mechanical scraping to pull out the loose hair, skins are treated to remove the fleshy parts and the remaining lime. They are washed first with products

[3]

Chrome tanning turns skins blue-gray. So ones for white shoes are treated with Du Pont white pigments, in addition to oils.

Next the leather is sprayed with a finish. Here it contains white pigment but dyes of various colors are also important.



like the Polychemicals Department's hydroxyacetic acid or Grasselli Chemicals Department's lactic acid, and then by strong mineral acids to get them in good condition for the most important process—tanning.

The purpose of tanning is to convert the skins or hides into a softer, tougher material that won't be harmed by bacteria. Many processes have been tried. In fact, the ancient Egyptians had such a good one that some 50-century-old articles made by them are still well-preserved. To speed up this slow process and improve the properties and appearance of the leather, several new tanning agents have been used. The most revolutionary are the chromium salts, first studied in England and introduced commercially by an American chemist.

While straight chrome-tanning is still the major method, it is not the only one. Sometimes combined alum-chrome is used. For sole leather, the advantages of vegetable extracts keep them in the running. The Electrochemicals Department enters the picture again with its formaldehyde, used as a pretanning agent and for blending with other agents to make white leathers.

MAKING WHITE LEATHER WHITER

White leather, by the way, has raised special problems. As shoe upper stock comes from chrome tanning, it's a bluish-gray color. "What's the best way to make the surface bright and white?" wondered the chemists. One answer was "Ti-Pure" titanium dioxide. This pigment is used in the last stage of tanning, and also in leather finishes and shoe polishes.

But that wasn't always a complete answer. Scuffing or rubbing often broke through the surface of white shoes and left permanent bluish-gray scars. A new approach seemed necessary, and Du Pont chemists explored the field of synthetic resins.

After hundreds of tests, "G-942" tanning agent proved successful in making kidskin sueded for better-quality white shoes. Used along with other tanning agents, this resin leaves the leather white clear through so that it can be cleaned easily.

If the leather is dyed, beautiful shades are obtained with coal tar colors such as the "Pontamine", "Pontacyl" and "Pontachrome" dyes. The dyed leather is then "fatliquored" to replace the natural oils lost in tanning, and to give a stronger, better-looking product. Many different oils are used, along with chemical products like "Duponol" WA paste fatty alcohol sulfate and "Avitone" A leather softening agent, which leave the surface less greasy.

After intermediate steps such as drying, the leather is given a durable finish, often pigmented, based on resins and waxes such as the Fine Chemicals Division's "Methacrol" resin dispersions or the Polychemicals Department's "Hypalon" synthetic resins and "Opalwax" synthetic wax. In the case of smooth leathers, the finish is then glazed or embossed.

The shoe manufacturer takes over from there. He gets several boosts from the chemical industry, too. For making box toes, he's likely to choose "Celastic" colloid treated fabric as a stiffener. And he covers the vulnerable wood heels of women's shoes with "Pyralin" cellulose nitrate plastic, which can be matched with practically all leather surfaces and gives scuff-resistance. If the shoes are casuals, he may use neoprene for sturdy, eye-catching crepe soles.

For the fine quality of American leathers and shoes, first honors go to the tanners and shoemakers, and their machinery manufacturers. Here in the chemical industry, though, we're glad for our many opportunities to aid their enterprise. When you think of your feet, give the chemist a hand, too.

Before going to shoe manufacturers, the leather is classified according to its thickness.



You fly by color

To help get the correct grade of gasoline for your flight, aviation fuels are colored for identification with dyes such as new Du Pont Oil Blue A



Trying to fly with the wrong gasoline would be like trying to run your car on kerosene—it just wouldn't work. Aviation engines are extremely sensitive to fuel octane number, and for this reason it is vital that the correct gasoline be used.

The petroleum industry is presently supplying three grades of gasoline for commercial and military flying. To aid in identification, the various grades are dyed distinctive colors. Grades and colors are: 91/98-blue, 100/130-green and 115/145-purple. By way of explanation, the first number in the grade designation indicates the antiknock characteristics of the fuel under lean mixture, or cruising conditions; and the second number indicates the antiknock characteristics under rich mixture, or take-off conditions.

Wondering what gasoline powered your last flight? If you went by DC-3, a workhorse of the airlines, 91/98 grade was probably used. Or if it was by Constellation, DC-6, Martin 202 or Convair, 100/130

grade supplied the zoom. For military planes the 115/145 grade, as well as two others, are used.

To insure uniformity, dyes used for aviation gasolines must be stable and not change color with time. Du Pont has for years been supplying high quality dyes for both aviation and motor gasolines. However, research is constantly under way to improve these products, and only recently a new blue dye called Du Pont Oil Blue A was announced. It is much stronger and more soluble than the one formerly supplied.

This development marks an important step forward because blue is the basic color in all aviation gasoline colors. Green is made from blue and yellow, and purple combines blue and red.

So the next time you scan the horizon from three miles up or hear those engines high overhead, you will know that for identification purposes such a commonplace thing as color is important to aviation.

Less wrinkle for fabrics

For good grooming, unmussed garments are a must. Now they can stay neat longer because of "Zeset" durable wrinkle resistant finish

Do you remember that freshly pressed summer suit that "gave up" after its first wearing... how it just seemed to collect wrinkles and creases? Thanks to chemistry, cotton and rayon clothes can now stay neater longer with less care and upkeep. Such garments are made from fabrics processed with special compounds, among them the new "Zeset" finish.

The idea behind crease-resistant treatment is not new. It has long been known that cotton, viscose rayon, and combined viscose-acetate rayons suffer from wrinkling more than does wool.

But the older type resins that were used to cope with the problem had certain drawbacks. Some would discolor badly on bleaching—or weren't satisfactory on rayons that were to be washed—or would solidify during application and have to be scraped off the processing equipment.

Trying to remedy these difficulties, Du Pont chemists investigated about 100 chemical formulations that showed promise along these lines. Their systematic studies, over a period of several years, showed that the present "Zeset" was the best candidate, and the easiest to apply. After laboratory tests, the product was taken to a Southern textile manufacturer for a trial under mill conditions. The manufacturer liked it, as have several others since.

Mill owners find that "Zeset" gives good crease resistance, so that ordinary wrinkles will hang out quickly between wearings. Like previous finishes, it helps the fabrics hold their shape, with less stretching and shrinking to worry about. In addition, it stands up well under normal laundry and dry cleaning conditions. You can even use bleach when washing rayons treated with "Zeset". And it can be applied economically in the same bath with other textile finishing agents such as "Zelan" durable water repellent finish.

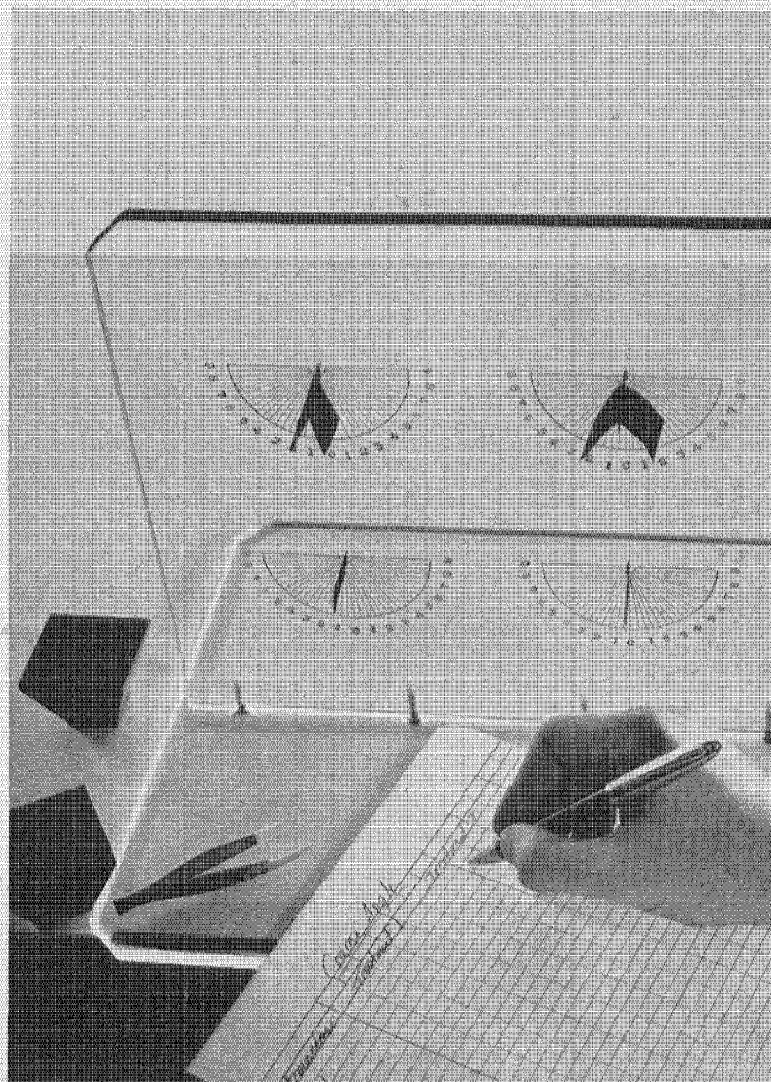
A striking property of "Zeset" is the soft, mellow feel or "hand" that it gives to a wide range of fabrics. By adding certain other chemicals, the hand can be varied to give special effects on particular materi-

als. Spun rayons, for example, can have a wool-like feel and resilience.

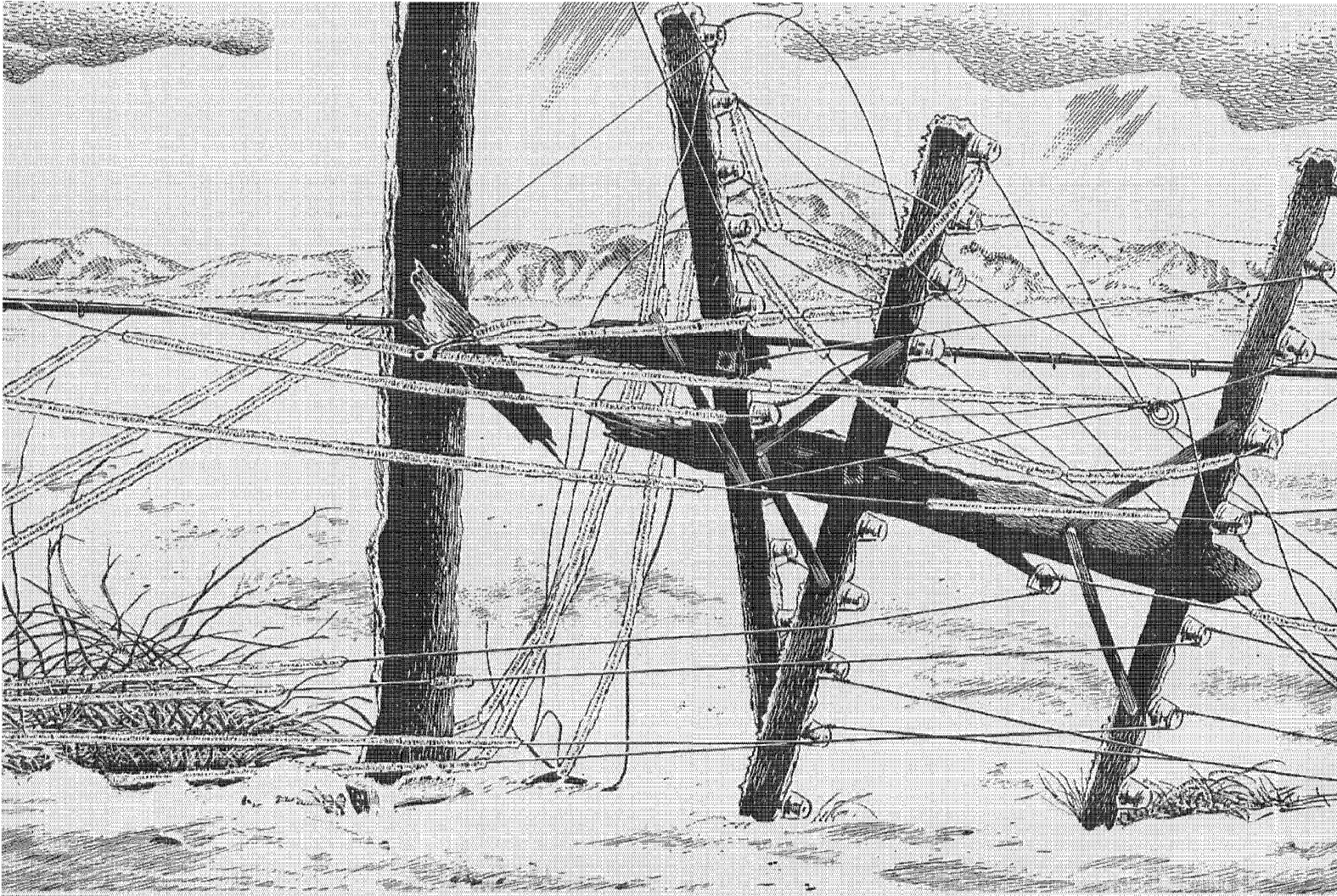
During the first mill trial, the textile manufacturer's imagination was sparked by this property, and he went ahead on his own to design new types of fabrics especially suited to this new finish. A neighboring mill, making embossed fabrics, discovered that this product helped set the pattern and gave the desired softness at a lower cost.

In the near future you may be buying a suit, skirt or other garment made from a fabric treated with this new wrinkle resistant finish. You'll find that it looks better, feels better and keeps fresh longer. And you may be seeing many new types of fabrics, as "Zeset" extends the market for serviceable rayons and mixed-fiber textiles.

Swatches creased by weights are hung on tester. Spread-eagle effect of treated one (right) shows it coming back to shape.



◀ At Mooresville Mills, Inc., in North Carolina, "Zeset" is applied to a fabric for wrinkle resistance. Easy application is one advantage that appeals to plants using this product.



No more of this

Year-round phone service over the Cascades in Washington has been insured by installing a new all-weather underground cable. Du Pont dynamite speeded the work

By RAYMOND A. PETERSON

"Needed at once: Sixty men to shovel snow from telephone lines." The Pacific Telephone and Telegraph Company won't have to appeal for help in the future. The main trunk lines between Seattle and Yakima are no longer exposed to ice and snow; they're buried in a coaxial cable line. The cable was used for the first time last summer as part of a new cross-state telephone route. Now let Nature bring on her most destructive sleet storms, like the one in 1949 that cut off telephone service between eastern and western Washington for three days.

Overhead lines on poles, heavily braced to withstand gales and the pressure of 10-to-20 feet of snow, are still in service. Traffic, though, is gradually being

diverted to the buried cable as more and more terminal equipment is installed at communication centers. Eventually, the overhead wires and poles will be dismantled and the fight each winter to keep the lines up will become a fireside topic among telephone construction men.

The job of constructing a five-foot trench and installing the all-weather cable between the two cities has cost P.T. & T. more than \$4,000,000. As far back as 1946 plans were made to get the long-distance circuits underground, safe from the weather. Field surveys and engineering studies were made and the work was far enough advanced in 1948 to start clearing the right of way, trench-cutting with a plow train, laying the cable and backfilling.

Thus stated, these operations seem simple enough—and they would be if the terrain in the Cascades was like that in Kansas or Nebraska. But it isn't. And that's why the better part of two years was required to complete what was really a big job. Considering that the airline distance between Seattle and Yakima is more than 100 miles, the overland route is of course considerably longer, with plenty of obstacles to overcome. In the lowlands, swamps had to be drained so that the big excavating machine wouldn't bog down. Douglas fir stumps—in some cases six feet in diameter—had to be shot out of the way. Huge boulders barred progress at many points, and long stretches of the trench line were blasted through solid rock. More than 80,000 pounds of Du Pont dynamite were used in these operations.

Where ground conditions permitted, the required five-foot trench was made with the big plow drawn through the earth by three powerful tractors. Then the plow train, with reel attached, laid a 1,000 foot section of the cable in the trench and completed the burial operation. Meanwhile, workmen spliced and sealed another section, as the train moved ahead to its next work assignment. Thus, slowly, section by section, the new coaxial cable was installed underground all the way from Seattle to Yakima.

This cable is a wrist-sized, lead-sheathed assembly

of four well-insulated copper tubes. Two of them are capable of carrying 600 simultaneous voice messages; that is, one tube transmits 600 messages in one direction, while the other carries 600 more the opposite way. The remaining tubes serve control purposes, regulating the quality of long-distance voice transmission. Also housed in the cable are many small insulated wires to carry the traffic of local telephone calls.

The complete cable assembly has been called "a gas pipe wired for sound," which is an over-simplified description. But in one sense at least it is apt; for under operative conditions this lead-overcoated cable carries a charge of nitrogen gas under a pressure of nine pounds per square inch. And if the pressure drops below six pounds in any 9,000-foot section of the cable, automatic recording instruments housed in "huts" all along the line, operate electric signaling devices at terminal headquarters. A red light indicates where the "trouble shooters" will have work to do.

The equipment required to operate a modern telephone system is beyond the understanding of most patrons. The difficulties met and overcome in the construction and maintenance of the service lines are seldom headlined in the news. But the communications industry is a vastly important one. Let that stand as our justifying reason for reporting the P.T. & T. Company's successful work in outsmarting Old Man Winter in the Cascades with the aid of Du Pont dynamite.

Crew drills in preparation for blasting. Some 80,000 pounds of Du Pont dynamite cleared way and blasted trench for cable.



Coaxial telephone cable, buried in a trench, connects Seattle with Yakima. Crews crossed solid rock ledges, bogs, streams.





Protection for cats and cranes

By JOHN E. SLY

By this time you've probably put antifreeze in your car's radiator—and so have many owners of cars, trucks and buses you pass on the highway.

But slogging away at countless tasks, from the logging camps of the Pacific Northwest to the highway construction jobs of the growing Southeast, are

thousands of expensive machines you seldom see. Many of them, too, are protected with "Zerone" or "Zerex" antifreezes.

Called "off-highway" equipment, these machines carry such descriptive names as cats, shovels, cranes, graders, saws, drags, rollers, dredges, rigs and whatever pet name the operators pin on them. They're used for construction, mining, road building, logging,

quarrying and snow removal. And you'll find huge stationary engines in power plants and flour mills, and on the oil fields with "Zerone" or "Zerex" in their cooling systems.

On dam construction jobs you'll find Euclids, cats, shovels, cat cranes, air compressors and mobile power plants. And at the Hungry Horse dam site north of Kalispell, Montana, there's a ponderous piece of equipment called a Monigan. One man, operating push-buttons, controls this dragline, which scoops up from 8 to 12 yards of gravel at one bite. It uses more than 50 gallons of "Zerex" in its cooling system.

LOGGERS NEED ANTIFREEZE

In the remote logging regions of the Pacific Northwest, antifreeze is a cold weather essential. If it were not for the modern automotive engine this tremendous industry would not be the giant it is.

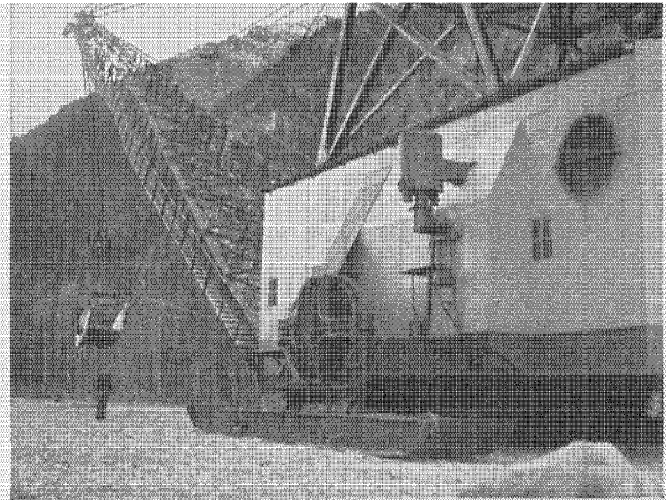
The Crown-Zellerbach Corporation at its Melalla Camp, for example, uses 21 specially-built trucks with engines of 150 and 200 horsepower. During the winter they are protected with "Zerex".

"These rigs cost about \$20,000 each," said the truck supervisor at this camp. "And it sometimes gets plenty cold back here in the mountains—30 or 35 below zero. We need the best antifreeze we can get."

At the Longview, Washington, operation of the Weyerhaeuser Timber Company, the assistant purchasing agent said, "We use 'Zerex' in our logging rigs and trucks. But we have found that we can save money by using 'Zerone', too. We put it in our yarders, speeders and some of our cats. Vibration and rough use make it impossible to keep the cooling system tight and leak-proof in some of these engines, so we just keep refilling these units from a premixed 'Zerone' solution—and it works out O.K."

In other fields, too, you'll find equipment that needs antifreeze when the weather gets cold. From the mountains of Nevada to the anthracite coal regions of Pennsylvania is quite a trip, yet in both places, and in the miles between, you can find a Du Pont antifreeze protecting the equipment so vital in open-pit mines and quarries.

At Pioche, Nevada, the Combined Metal Reduction Company drove a shaft down 2,000 feet to bring out ore containing lead, zinc and gold. And from an



Scooping up gravel from a river bed, this Monigan is at work in Montana where temperatures of -40°F. aren't unusual.

open pit on the surface they bulldoze and scoop a volcanic mineral called perlite. When cleaned, processed and heat-treated, it pops like popcorn to almost 10 times the original size and is then marketed as "Panacalite" plaster aggregate. This company uses "Zerex" in all equipment because it operates at altitudes up to 12,000 feet. "One of its nicest features," according to the mechanical superintendent, "is the inhibitor that keeps the cooling systems of our equipment so clean."

Eastward, the anthracite regions of Pennsylvania have long been known as the proving ground for heavy-duty equipment. Big mining companies purchase antifreeze in carload quantities to protect their equipment. Largest are the drags—a kind of crane with a bucket—used to dig away earth and rock before mining the coal. One of these, a Manitowoc Speed-crane owned by the Hess Company of Hazleton, Pennsylvania, swings a boom 140 feet long with a four-yard dragline scoop. The cooling system for its 12-cylinder diesel engine is protected during the winter with more than 35 gallons of "Zerone". Warren Hess says, "We have used this for the past eight years and have always found it satisfactory."

Perhaps that's why so many operators protect their expensive machines with a Du Pont antifreeze.

To stay clean, cooling systems of logging trucks require antifreeze with inhibitor.



LeFournneau Pulls working on Heart River Dam, N. D. use "Zerone" and "Zerex".



Workhorse equipment like this steam shovel is costly; needs a high-quality antifreeze.





Quality alone isn't enough for success in the bottling business.

Even trucks are important in creating

A selling appearance

Men who make soft drinks for a living say it takes a lot of things to sell a good product. You need plenty of sales outlets, an attractive bottle, good advertising, a fair price, and modern equipment that makes a good impression on the public.

Manufacturers put a lot of stress on this "good impression" business, and those at the Coca-Cola Bottling Company of Houston, Texas, told us of the problem they have in keeping their trucks and other equipment attractive looking.

"Our climate is tough on paint and metal," they said. "It's hot and often humid. Like most other growing cities, we have some smoke and paint-damaging fumes in the air, and the shell roads in our area form a dust that cuts like ground glass. So we've adopted a

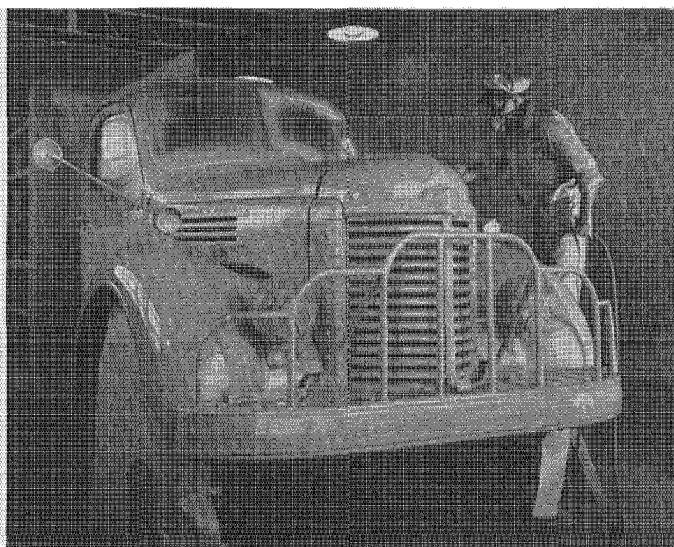
regular painting schedule to keep the appearance of our 180-odd trucks always at its best. We do much of this reconditioning during the winter when business is less brisk."

Refinishing takes a vehicle off the road something like two or three days. There are only a few major steps in the process. First, each truck is thoroughly cleaned with a solvent to remove grease and wax. Then, the old finish is sanded down. Next, priming and surfacing coats of Du Pont "Preparakote" primer are sprayed on, and then, after drying and sanding, yellow "Dulux" enamel is applied. Still later, the trade-mark is stenciled on in red "Dulux".

Refinisher Tom Androsik says, "Du Pont finishes help me because I can do a good-looking job with them. And fast!"



Sanding a truck to prepare it for the actual refinishing. Houston Coca-Cola repaints its trucks on regular schedule.



After coats of "Preparakote" primer are sprayed on, the surface is sanded again and DuPont "Dulux" enamel is applied.

Houston Coca-Cola's program of refinishing coolers—those dispensers or bottled Coke machines—is just as thorough. When a route man finds one that needs a face-lifting, it is brought to the plant. There it gets the works from A-to-Z—mechanical checkup, disassembling, steam-cleaning, sanding, masking, prime-coating, another sanding and then spraying with two coats of Du Pont "Dulux". The trade-mark is stenciled on to complete the job, and the cooler is returned.

We've said this pays off on appearance, but there's still another dollars-and-cents benefit. These units belong to the individual dealers who sell Cokes to the public, and they foot the bill for new ones. If the coolers weren't refinished, they'd last something like three or four years. Some units, however, can be refinished three or four times. This is quite a saving for the dealers. "A gallon of enamel will paint five boxes."

the head of the cooler refinishing department remarked, "but if we only used a cupful, we would want the best protection we could get. 'Dulux' enamel has been consistently good, and we stick to it."

Next door, in the advertising section, metal signs are brought in for renovating. Suppose a Coke sign with his name painted on it has been lent to druggist John Smith, and then he sells out to Gus Jones. The Coca-Cola people, instead of furnishing a new sign, bring in their old one, and refinish it with "Dulux". "Gus Jones" is lettered on, and the sign is rehung. Simple and inexpensive as that.

This is a typical, not special, case. Throughout the country, soft drink makers such as Canada Dry, Dr. Pepper, Nehi, Pepsi-Cola and Seven Up have also found that Du Pont finishes help their equipment make a good "selling appearance."

Face-lifting for coolers. By refinishing such units, the dealers who display them have new-looking sales equipment.



First it was trucks, then coolers and now signs . . . all refinished with "Dulux" enamel to give them good protection.



New diet for the soil

"NuGreen" fertilizer compound, recently announced by Du Pont, offers a better way to enrich farmlands



Today the fertilizer industry, the backbone of our country's farm production, has a new product at its command. Farmers are drilling it into the soil, distributing it from airplanes, pouring it into irrigation ditches, and even using it in a unique leaf-spray application. It's "NuGreen"—the latest chapter in the story of synthetic urea for fertilizers.

Du Pont began supplying nitrogen to the fertilizer industry in 1929 as an outgrowth of its development work with high-pressure methods for taking nitrogen from the air and turning it into chemically bound-up nitrogen. Naturally, this was important, for plants need lots of this element for healthy, abundant growth.

One of the first types of synthetic fixed nitrogen to go to the fertilizer trade was anhydrous liquid ammonia. In the late 1920s, before the air at the Belle, West Virginia, plant began buzzing with talk of synthetic urea, the Company was already supplying ammonia to manufacturers of mixed fertilizers.

Putting two and two together, chemists began to

say, "This ammonia we're selling for fertilizer mixtures improves their properties a lot. But extra nitrogen is always welcome. Why don't we take water solutions of ammonia and urea, and substitute them for ammonia itself?" Marketed in 1931 as Urea Ammonia Liquors, these solutions were the first ammoniating liquors made with a fertilizer compound dissolved in them. They caught on quickly.

But the chemists had still other ideas on the fire. In the early 1930s they were thinking, "Urea is a fine nitrogen source, but we can only dissolve so much of it in UAL, and only so much UAL will combine with the fertilizer industry's superphosphate. Why don't we stop trying to hang urea on ammonia's coattails? It can stand on its own feet as a fertilizer ingredient."

So in 1937 they put "Uramon" fertilizer compound on the market. This product, based on crude solid urea, got a prompt and enthusiastic response. For many years it increased the supply of urea nitrogen available for enriching fertilizer mixtures.

Then workers at the New York Agricultural Experiment Station made a startling discovery. They found that apple trees could be sprayed with very dilute urea solutions. The leaves apparently absorbed the plant food even more quickly than the roots did in normal soil treatments. Apple growers soon began clamoring for urea to spray on their trees.

There was just one trouble—the experiments were originally made with “Uramon”. Du Pont had not designed this product to be dissolved in water and sprayed on plants, but intended it for ground application. It wasn’t completely water-soluble and caused serious clogging trouble in spray equipment. Something had to be done.

To broaden the usefulness of urea nitrogen, the formulation was improved once more. The result was “NuGreen” fertilizer compound, the most recent contribution to urea nitrogen plant feeding.

Thousands of tons of “NuGreen” each season are being applied as top dressing for cotton, tobacco, potatoes and other vegetables, as well as pastures and citrus fruits. Large commercial apple growers are using it effectively as a foliage spray. It’s so versatile it can be added to irrigation water and sprayed from planes. It’s even a fine fertilizer for rice lands, which are flooded much of the time. With its high solubility in water, you’d expect “NuGreen” to be washed away easily after it is applied. Many nitrogen bearing compounds do “leach” seriously from wet soil. But after “NuGreen” is applied, it undergoes certain chemical reactions in the soil which bind it to soil particles. These reactions account for its successful use under moist conditions.

“NuGreen” contains an extra concentrated dose of nitrogen—44 per cent—and is easy to handle in the farmer’s distributing machinery. Until quite recently, “Uramon” and “NuGreen” have been considered companion products in the fertilizer industry—one for



Commercial apple growers use “NuGreen”—sold only in 80-pound bags through fertilizer distributors—as foliage spray.

ground application, the other for spraying. Now both fertilizer manufacturers and farmers are rapidly turning to the new product.

Compared with other types of nitrogen fertilizers, “NuGreen” saves time and hard work for the farmer. Because of its high nitrogen content, he doesn’t have to haul as many loads, handle as many bags, or need as much storage space. These ease-of-handling factors are high on the list of requirements of a good fertilizer.

Experiments are still being conducted on “NuGreen”, and the future holds many more interesting possibilities for commercial growers. “NuGreen” is concentrated and therefore must be used sparingly. It is sold only in 80-pound bags through fertilizer distributors.

Still, the ultimate consumer—who never sees “NuGreen”—has the biggest stake in the story. He’s the one who eats the healthy, plentiful crops that this fertilizer helps produce. So, in a very real sense, his well-being is in the “NuGreen” bag, too.

The new fertilizer compound is applied as top dressing, added to irrigation water, or sprayed from planes.



News for puddle-jumpers

...the story of a better foul-weather fabric combining the advantages of rayon and nylon

By W. W. CARTY

Rain is news! Most of us capitalize on the weather, as a greeting or topic of conversation, and often our remarks reflect gloom when the rain has dampened more than just our spirits. To keep you drier on the outside, a new rainwear fabric is now in production. Preliminary tests place it in a class by itself.

Development work to produce this superior foul-weather fabric included extensive experiments with 30 different combinations of fibers and weaves by the Duplan Corporation in conjunction with Longleaf Mills. Since then, other textile firms have joined in its development and manufacture.

The researchers were well rewarded for their efforts. One of the experimental materials combining rayon and nylon completely out-performed existing rainwear fabrics when subjected to the simulated assortment of wet weather—from drizzles to “pitch-forks”—brewed at will by the laboratory “rain-tester.”

The rain test is relatively severe and measures a fabric's ability to resist penetration by rain. It subjects a piece of cloth to various intensities of water impact. To be considered “storm proof,” for example,

a 64-square inch test sample must not allow more than one gram of water to pass through during a five-minute “storm” exposure on the “rain-tester.” A light, four-ounce-weight sample of the new rain fabric, treated with Du Pont “Zelan” durable repellent finish, resisted all but three-tenths of a gram of water under this drenching—the best performance recorded to date for a treated rain fabric of comparable weight.

Tough, filament nylon was selected for the fiber running in the vertical or warp direction of the Oxford weave, while spun rayon yarn shuttles back and forth horizontally as the filling.

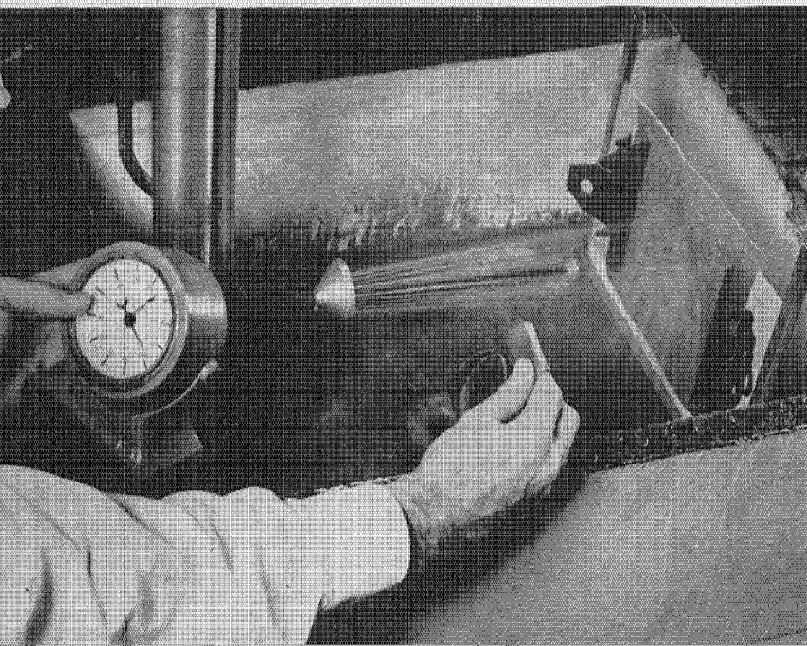
Here, then, is an excellent example of how textile research has further capitalized upon characteristics inherent in two man-made fibers to develop new standards of protection and comfort in rainwear.

The rayon is produced by the new direct spinning process wherein Du Pont “Cordura” high-tenacity rayon fibers are converted into yarn in a single continuous operation. The resulting spun yarn is much stronger than conventional ones, and has a high shrinkage. When coming into contact with water in the finishing operation, the yarn in this particular fabric construction shrinks about 11 per cent.

The shrinkage characteristic of the filling yarn is of great importance in making the new nylon-rayon rainwear fabric. In order to have the finished fabric a 42-inch width, for example, it is necessary to weave it approximately 49 inches across the loom instead of the conventional 43 inches. This greater width utilizes many more nylon vertical warp fibers than otherwise would be possible. The result is an extremely dense, compactly woven cloth ideally suited for rainwear. The natural openings in the weave between the nylon and rayon fibers are minute enough to resist water penetration, but permit the material to “breathe” for comfort in wearing.

Nylon adds several “extras” to the fabric. This fiber is naturally tough and light—twice as strong and only half as heavy as the same size aluminum wire. It is durable, has dimensional stability and dries quickly.

If you're saying, “That sounds too good to be true,” you're partially correct. For the armed forces are utilizing much of the fabric currently produced for officer and enlisted personnel raincoats. The manufacturer tells us that when you can buy one of these nylon-rayon raincoats, you'll find it moderately priced and in attractive colors. It will weigh less than two pounds, be comfortable to wear, and will give you long, dependable service . . . more dependable, in fact, than the weather itself.



Let it pour! This rainwear cloth gets a carefully timed dousing comparable to a cloudburst. By scientific comparisons on this “rain-tester,” new rayon-nylon fabric can keep you drier.



Why there's not enough cellophane

Here are the reasons...and what is being done to relieve the present shortage

When you went shopping recently, you may have noticed that cellophane was missing from some products you normally find packaged in this sparkling, transparent film. The reason is simple. Sales of most products have increased, some quite substantially, but production of cellophane has stayed about the same. As a result, many companies have had to discontinue or curtail packaging some of their products in cellophane because of the present shortage, and use the film that's available where it will do them the most good.

Since last winter, the demand for Du Pont cellophane has exceeded our production. And so, beginning in April, the Company placed all customers on allocation to assure them a fair share of our production.

phane business constitutes a monopoly and requested that Du Pont be divested of one or more of its existing plants. This Company is resisting this charge to the fullest but, pending the outcome of this litigation, it was considered unwise to go ahead with the proposed construction.

However, Du Pont could not ignore the plight of the many cellophane users who needed more film to expand their markets and so sought to interest others in the manufacture of cellophane. It took more than a year and a half to find a company able and willing to invest the approximately \$20,000,000 necessary to enter the field on an economically efficient basis. A new plant, designed and being built by Du Pont for



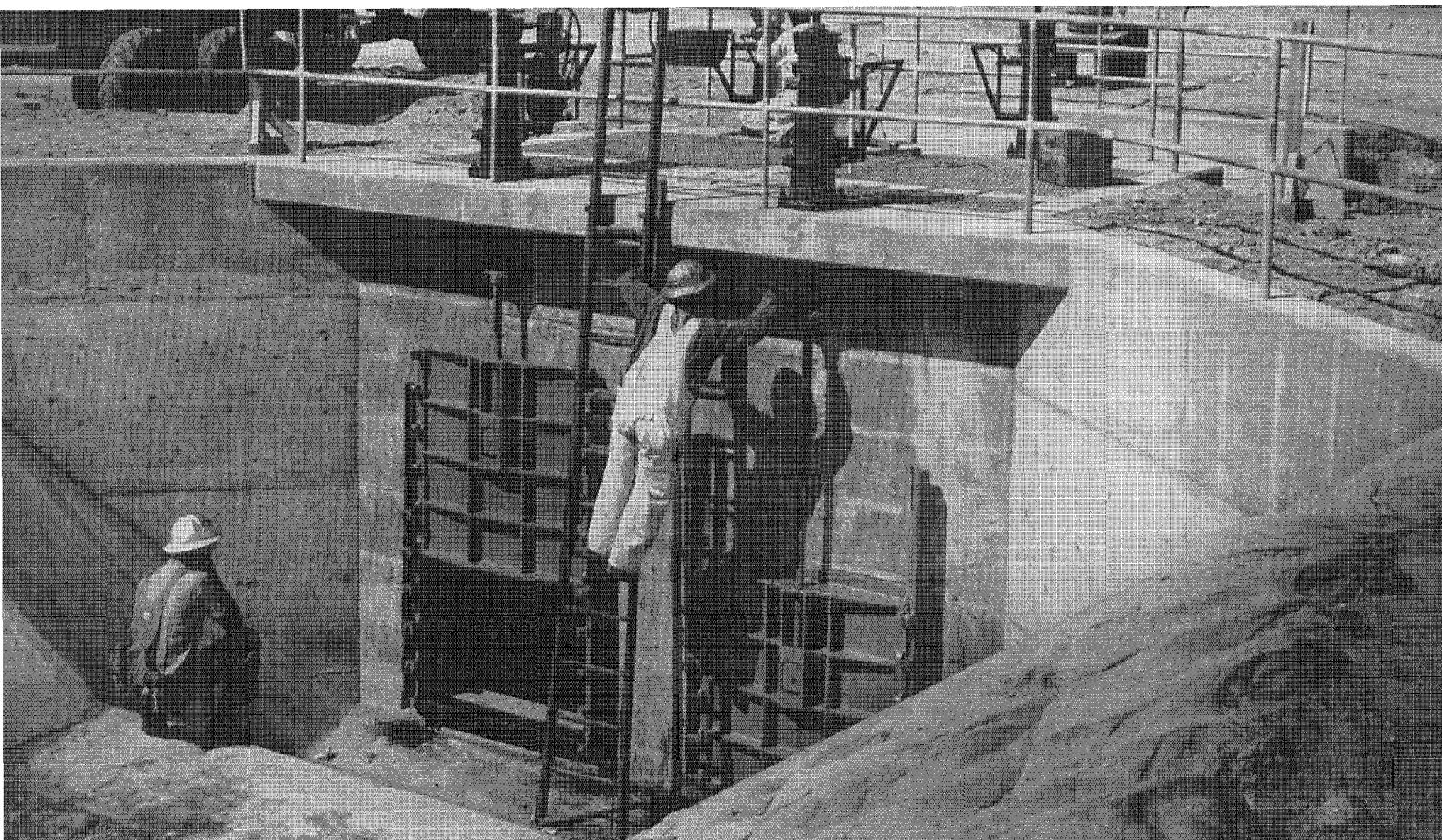
What caused this shortage? The story begins a few years ago when Du Pont foresaw a greater demand for transparent packaging materials. Users were distributing more cellophane-wrapped products and adding the film to new ones. In addition, self-service selling was making rapid strides, and cellophane was called for to display and protect a growing volume of merchandise sold in this manner. It was apparent that more cellophane would be needed.

As any other company would be expected to do under such circumstances, Du Pont planned to build additional plant capacity—planned to be in operation by mid-1949. Preliminary plans, estimates and investigation of plant sites were well under way when the Department of Justice brought suit in December, 1947. It charged that Du Pont's position in the cello-

Olin Industries Inc., is now under construction at Pisgah Forest, North Carolina, and all patents and "know-how" are being made available to them. It is hoped that this new plant, with an initial capacity of about 33 million pounds annually, will be in production by the middle of next year.

In addition, manufacturers of other types of transparent films are producing more, and have publicly announced plans for sizable plant expansion within the coming year.

All this makes the picture brighter, and the present shortage should be eased in the foreseeable future. Shoppers will again be finding more and more products packaged in transparent film, even though the increased film supply to wrap these products does not come from Du Pont.



Building water retention ponds at Du Pont's new Texas plant... part of Company's program to eliminate stream pollution.

Industry's stepchildren

... are the useless by-products of chemical manufacture. Du Pont spends millions in cutting down stream pollution and seeking better ways for disposing of this waste

By JAMES H. McCORMICK

In the flat Texas plain 10 or so miles south of Victoria, a crew set up their rig to drill a well. They weren't after oil or gas—or even water. But downward cut the bit, and chewed a hole in the ground a mile deep. If Du Pont engineers are right in their experiments and calculations, they will be able to pump wastes from their new plant into the layers of sand at the bottom of the hole for years to come.

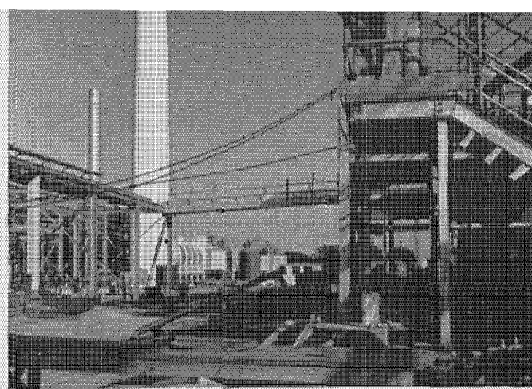
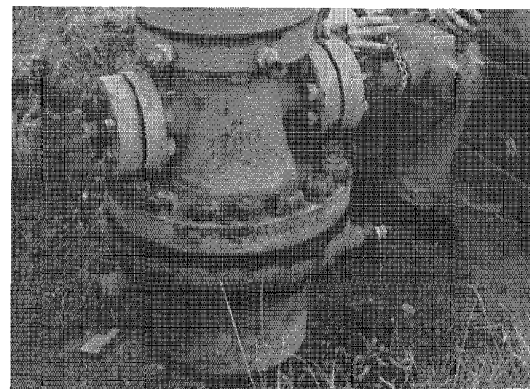
Well drilling isn't the usual approach, but all plants must get rid of the useless by-products of their manufacturing processes. Waste disposal poses a lot of \$64 questions and is often expensive, but no up-to-date manufacturer underestimates its importance. Good community relations depend on it.

Du Pont has yet to solve all of its problems, but has made good progress. The Company to date has spent more than \$18,000,000 at its various plants to

dispose of waste products without harming or annoying its neighbors. Work at new locations or on new chemical processes is not complete until all questions of waste have been answered to the satisfaction of the Company and public stream-protection agencies. Older plants continue to work on better ways to avoid polluting streams or the air.

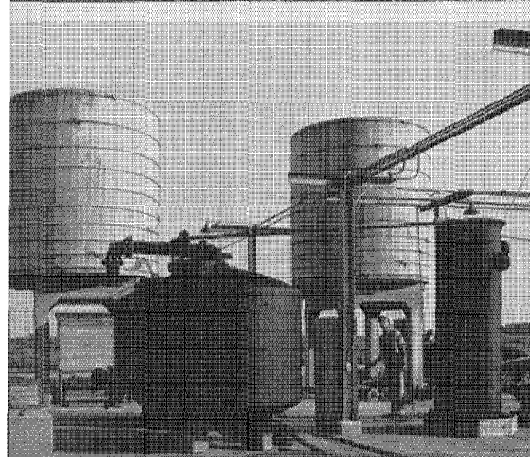
Some wastes, like cooling water, can usually be discharged directly into rivers. Obnoxious ones are handled in a dozen other ways. In deciding what to do with them, Du Pont applies the same research techniques used to develop new products. Scientists continually try to cut out useless by-products, or to find markets for them. Often waste products are inherent in a manufacturing process, however, and a way must be found to dispose of them.

Long before a brick was placed or a piece of machinery was bought for the Victoria operation, wastes from the chemical process for nylon intermediates were studied and restudied. Could these by-products be eliminated or reduced? What were their properties? Were they worth anything for some other job? These and scores of other questions were raised and answered.



Here's all you can see of plant's waste disposal well. Drilling the hole cost \$50,000, but completed well disposal setup costs \$500,000.

Some useless by-products are burned in trash pits, under boilers, or in incinerators such as one connected to large stack in the background.



This unit will treat brine ticketed for the disposal well. To date, the Company has spent \$18,000,000 to dispose of its useless by-products.

There are five ponds for various types of liquid wastes at the new Victoria plant. Evaporation has kept the level of this one constant so far.

Then, and only then, was the actual planning of waste disposal facilities begun.

Brine, the largest of the wastes peculiar to this process, is scheduled for the disposal well. Getting rid of other types calls for investment in evaporation ponds, incinerators, a burning pit, and a setup for treating sewage. A 65-acre pond will put the hot Texas sun to work evaporating floor washings and process waters containing small amounts of organic chemicals. Almost anything that will burn will be ticketed for either the incinerator or trash pit.

Much water will be pumped from the nearby Guadalupe River for generating steam and for cooling, and normally it will be returned to the stream after use. Special precautions will be taken to prevent process materials from entering this water. For this purpose, two large water retention reservoirs will be filled and discharged on a cycle basis. Between the time

they are filled and emptied, tests will be made. In the unlikely event that the cooling water becomes contaminated, it will be pumped to the solar evaporation pond.

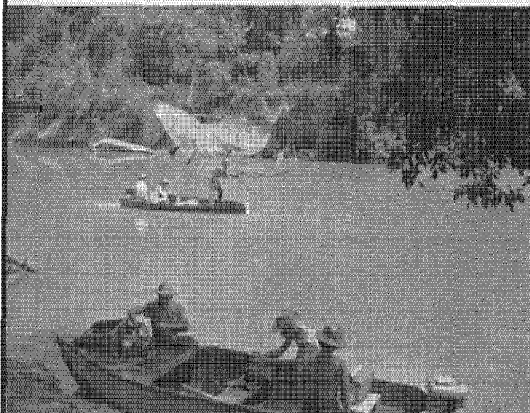
To make doubly sure Du Pont operations will not harm downstream rice farmers or the fishing industry, a group of scientists from the Academy of Natural Sciences of Philadelphia made two scientific surveys of the river. One in 1949 and another this past fall measured the health of the river—of its plant and animal life. These studies plus additional tests showed that the stream life won't be affected by the new plant. Nevertheless, a third survey is planned, after the new plant has been in operation a while, to triple-check this point.

HOW WAYNESBORO FIGHTS POLLUTION

Older plants usually face a tougher situation . . . older processes and equipment, less space to build

[20]

Scientists from Phila. Academy of Natural Sciences study river life by Victoria Plant.



Survey was to determine health of flora and fauna. Group is netting fish and other life.

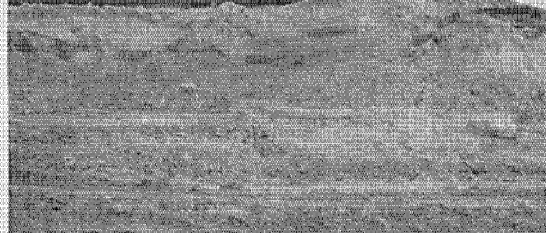


Taking sample of water for analysis. scientists also collected insects and pla

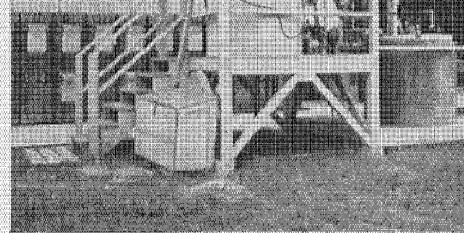




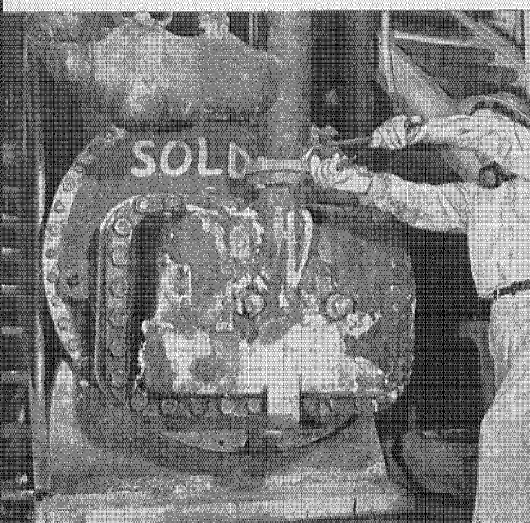
For years one of Waynesboro's biggest wastes was lime sludge, pumped into settling ponds.



The process has now been eliminated. Sludge that remains is sold to fertilize farmland.



This semi-works is operated to find ways for disposing of useless by-products.



There are many ways to lick a problem . . . disposing of old equipment is one of best.



Sampling water flowing into river. Plant has reduced oxygen-consuming wastes 60%.



Studying chemicals from acid recovery area. Waynesboro is a leader in reducing waste.

treating facilities, and the like. Typical of these installations is the one at Waynesboro, Virginia, where Du Pont began making "Acele" acetate rayon in 1929. Part of the plant is middle-aged by chemical industry standards, but Waynesboro has been a leader in eliminating waste. As engineers there say, "It's often easier to improve our processes than have stream pollution and chemical disposal to worry about."

Since World War II, Waynesboro has reduced by more than 60 per cent its oxygen-consuming wastes—the kind that harms stream life by using up its oxygen supply. An outlay of about \$5,000,000 for a new acid recovery area and recent elimination of an entire chemical operation have been chiefly responsible for this drop. Another \$125,000 was spent in the spinning areas for improved solvent recovery units.

The new acid recovery plant is paying dividends

in several ways. It's not only a safer way to save more acid for reuse, but also cut down stream pollution. The waste water now contains something like 1/40th as much acetic acid as that formerly discarded from the older equipment. The small amount of acid in the water is neutralized with supplies of a former waste, lime sludge. There is also other material in this water and pilot plant studies are under way to find how to treat it.

The answers may come tomorrow, or months later, but Du Pont keeps after better ways to get rid of its useless by-products. Du Pont is not alone in this. Almost all industry is working to clean up America's streams and cut down air pollution. Call it enlightened self-interest if you like, for industry not only wants to sell its products and prosper but also wants to be a good neighbor. After all, it is a responsible member of the community.

[21]

Blue crab caught near Du Pont plant. "May indicate abnormally salty stream," they say.



Tonging for oysters from bay near mouth of Guadalupe River. Many of them were dead.



Examining oysters. New Du Pont plant not harm stream life with waste products.



Neoprene leads a sheltering life

Du Pont's chemical rubber enables new coated-fabric houses to withstand even the fury of arctic gales

By ARTHUR M. VALZ

No, it's not an oil storage tank you see pictured below. It is a balloon-like structure of neoprene-coated glass cloth without any internal supporting framework of metal or wood. What holds it up? Just air pumped in until the pressure inside is slightly greater than the atmospheric pressure outside. The dome is held down by clamping it to a concrete ring. When deflated, the empty bag drops down and can be folded up like a

circus tent into a compact bundle for easy shipment.

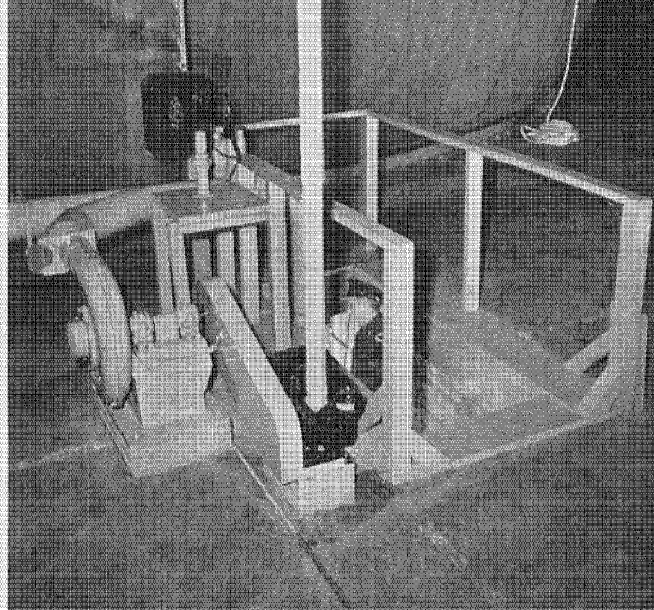
Several kinds of these portable shelters are being built for our armed forces. This big one—50 feet in diameter at the base and 36 feet high—is called a radome. It protects radar installations from wind, snow, sleet and ice. And units of this type are structurally ideal for the purpose. They are sturdy enough to withstand 125-mile-an-hour winds. There are no metal or wooden supports to interfere with radar reception. The neoprene-coated "skin" can be flexed enough to dislodge the ice and snow. If necessary, the dome can be heated from the inside with infrared lamps. In hot weather, the portable-like windows of "Lucite" acrylic resin are removed. As the hot air rushes out, cooler air is pumped in to replace it.



Engineers at a Buffalo, N. Y., aeronautical laboratory designed and built the first experimental radome of this type. They selected a neoprene-coated glass fabric because of its favorable dielectric properties, its ability to withstand temperatures ranging from -65° to $+140^{\circ}$ F. Moreover, it had good weathering qualities and resistance to sunlight, and was unharmed by contact with oils and grease that might be spattered on it while servicing equipment. Throughout the winter of 1948-49 this radome stood the buffeting of high winds, sleet, ice and snow—and came through undamaged.

Radomes are inflated by means of an air blower. The men who work inside are admitted through a tunnel equipped with an air-lock consisting of two doors, one of which is closed before the other is opened.

Also in service is a smaller portable unit known as the Quonset-type pneumatic hut. Like the radome, this hut has no internal braces; it is supported by air pressure alone. In this construction, however, air is pumped between an inner and outer layer of fabric, laced together with 40 to 60 interlocking threads a



A technician enters the radome by a tunnel equipped with air-lock compartment designed to keep air from escaping.



A pneumatic hut, coated with a neoprene compound designed to withstand extreme cold, keeps occupants warm and dry.

square inch. The dead air space between provides excellent insulation. Both the floor and superstructure sections are coated with a low-temperature neoprene compound that will withstand arctic exposures. Five airtight sections—one for the floor, another for the door, and three other wall and roof units bound together with neoprene cement—make up the hut. When inflated with as little as $1\frac{1}{2}$ pounds air pressure, the hut assembly supports its own weight. With 32 pounds air pressure, the inflated inch-thick walls will hold up a weight of 500 pounds, and when anchored properly with guy ropes, this hut is strong enough to withstand a 100-mile wind.

It can be blown up with hand pumps in about three minutes. Considering that all voids between the fabric layers are filled with dead air of high insulating value, a hut of this type affords comfortable quarters



This portable shelter looks like an Eskimo's igloo, and was unharmed by 80 mph winds during tests in Aleutians.

for four men. As the illustration shows, provision is also made for light and ventilation.

The pneumatic hut is particularly well fitted to meet the emergency needs of airmen or other military personnel stranded in the arctic regions. It has been service tested in the Aleutians under rain, hail, snow and high wind conditions with highly satisfactory results.

Neoprene coated fabrics already have a great many industrial applications. But now they are coming into a relatively new field as structural materials for various types of inflatable houses that are easy to prefabricate, assemble and transport. Their sheltering role for the armed forces suggests uses for industry such as temporary field headquarters for building contractors, shelters for sportsmen and even on-the-job housing for construction crews.

Chip off the old block

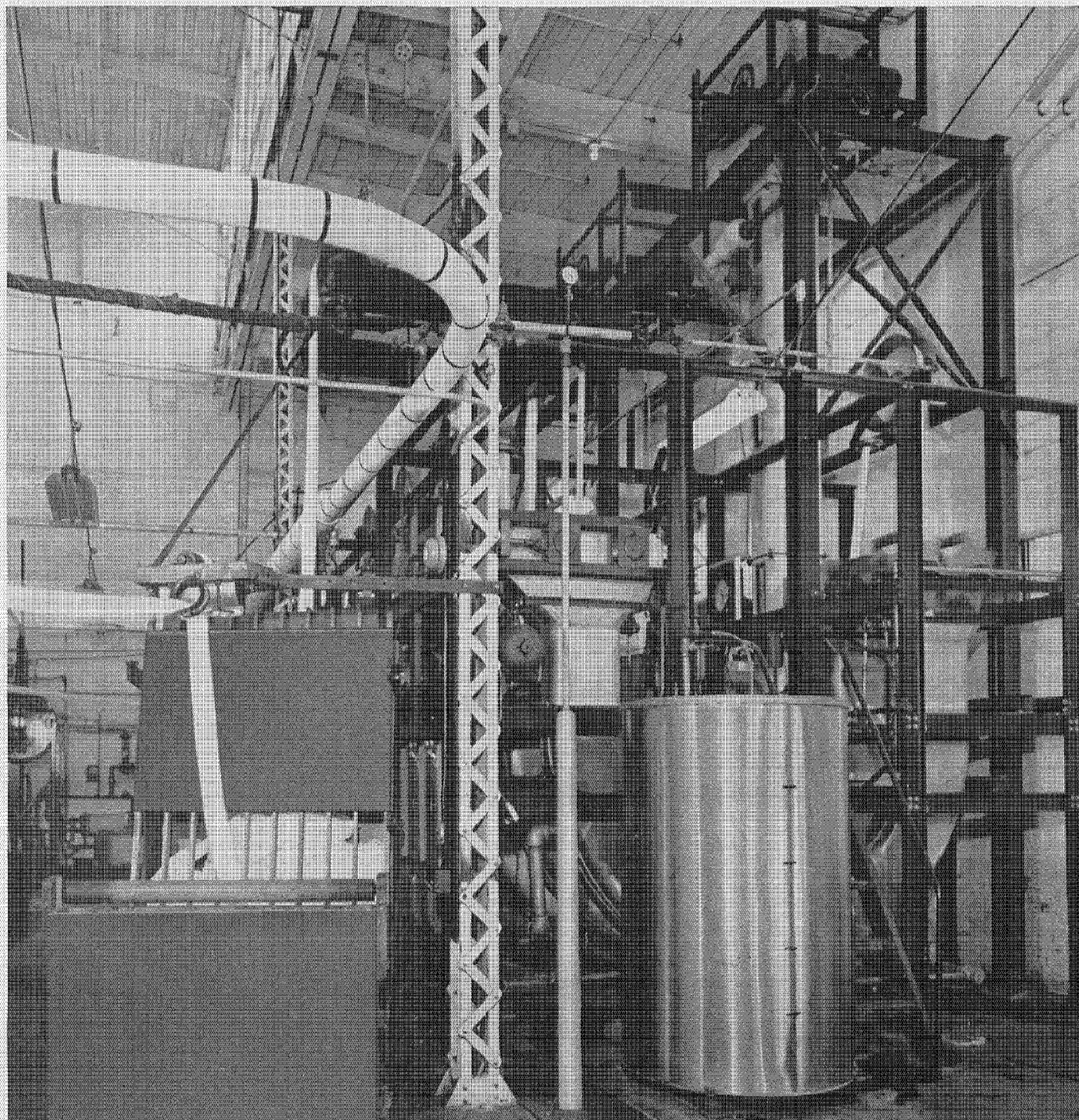
Meet "Junior" Continuous Bleach System, as big an aid for the small textile mill operator as its Dad is for the mass producer

By T. E. BELL and GORDON KESTER

One of the brightest youngsters in the textile processing field, the promising son of a famous father, has been attracting a steady flow of international visitors to the plant of the Kerriglen Finishing Co. in Providence, R. I., since last April.

So far Junior has been seen by textile men from the United States, Argentina, Brazil, Cuba, Holland, Denmark and Turkey. They made the trip specifically to examine the lusty infant—and cross-examine Archie Stevenson, Kerriglen's president and general manager.

What the visitors learned about the new Junior Continuous Bleach System for cotton and rayon-cotton



fabrics—to give Junior his full title—“definitely interested” them in its possibilities for their own plants, Stevenson says.

Kerriglen, a relatively small cotton print shop employing 75 men, has been the proving ground for the junior two-stage bleach range developed jointly by Du Pont and H. W. Butterworth and Sons, manufacturers of textile machinery.

The junior range, which comes in either a two-stage or single stage model, is tailored to fit the needs of the small textile mill operator just as its larger predecessor was developed in 1939 by Du Pont with the mass producer in mind.

Before Junior came along, Kerriglen found it uneconomical to bleach its own material because the shop's small volume did not warrant a large investment. Since the installation, as Stevenson told his foreign visitors, the plant has been saving 30 per cent on the cost of the vital bleaching process. The Providence mill men consider the new system an unqualified success.

Cotton fabric comes from the loom to Kerriglen and other finishing plants as gray goods. It is loaded with impurities—starches and waxes—that must be removed before the cloth can be bleached either for printing or for manufacture into white goods.

Older systems were slow and costly. They involved boiling the fabric for many hours in a large vat filled with caustic solution, and treating it again in a chlorine mix. The first step removed most of the starches and impurities; the second bleached the cloth.

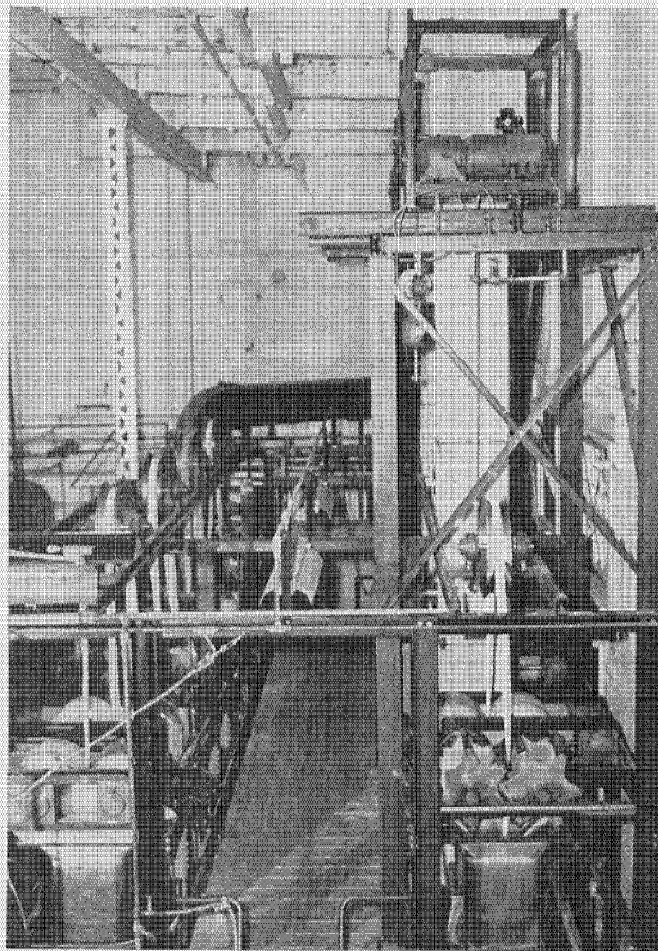
The two-stage system developed 11 years ago carried an endless length of fabric mechanically through both the cleaning and bleaching stages, and substituted hydrogen peroxide from Du Pont's Electrochemicals Department for the chlorine solution. The new system represented a saving in time, manpower and materials, and a 75 per cent saving in floor space.

Since then production on the standard large ranges has been stepped up from 1,500 to more than 6,000 pounds of fabric an hour. A towel mill, for example, running its range five days a week around the clock, can bleach 1,200,000 towels. The arrival of the junior range means that similar economies are now within the reach of the operator who wants to bleach only 500 to 1,000 pounds an hour.

PROCESSING OF FABRIC SIMPLIFIED

At Kerriglen, gray goods are fed rapidly through a succession of processes in one continuous length. The cloth whizzes past on open gas flame that singes excess fiber, plunges into a desizing solution that dissolves the starches, and then moves on to the bleaching unit in the next room through an overhead poteye.

There it feeds into the open end of a U-shaped pipe partially filled with hot water and is squeezed out at the other end through a wringer. It is washed again in a second U-pipe, soaked with caustic solution in a third, heated in a special steaming tube and then



This picture and the one on the facing page show two views of “Junior” Continuous Bleach System in operation. Manager says it saves chemicals, steam, space and also manpower.

piled up in a 25-foot-high column where it remains for an hour while the caustic loosens the grip of objectionable impurities. Two more washes, a soaking in the peroxide bath, and it is piled into a second tall column for an hour of bleaching. Two rinses after that and it streams out of the range snowy white, ready for drying and printing.

Stevenson and his plant superintendent, Stephen J. Bercen, agree on the virtues of the unit. They point out that one man operates it, while two or more are required on conventional ranges. Compared to kier bleaching, they say, the system saves up to 75 per cent in steam and 10 per cent in chemicals, and is four times as fast.

So far they have been bleaching mostly 80 x 80 4 yd./lb. print cloth, and have been turning it out at the rate of from 500 to 1,000 pounds an hour. Bercen says experiments have shown that the rate can be stepped up appreciably—with no loss of quality—if lighter material is put through. Both men speak with the authority of almost 30 years in the textile trade.

All in all, it adds up to an impressive record for Junior, which has yet to see its first birthday, and it establishes the newcomer as a worthy member of the family which stems from Du Pont research.

Rubber needn't smell like it

*With "Alamask" odorants, the rubber industry
is overcoming a serious handicap*

By PEG MINER

Among the culprits that offend our noses, the sulfur compounds are probably the worst. Witness the skunk odor and the smell of rotten eggs—nice, typical examples.

Then consider the plight of the manufacturer of rubber products. He works with a material that was vulcanized with the aid of sulfur, resulting in various unpleasant effects—some caused by "mercaptans," the chemical family to which the skunk smell belongs. On top of that, a host of other odoriferous compounds are added, including antioxidants, accelerators and inhibitors.

So much the worse for the toys, cushions, bathing caps, shoe soles and other rubber products we buy. One manufacturer, in fact, had a carload of rug underlay returned recently because of its odor. And a housing development couldn't be occupied at first because of two serious odor problems, one caused by evil-smelling rubber tiles.

For a number of years, our Fine Chemicals Division has taken an interest in such problems. Its aromatics specialists know that the human nose is so sensitive it can detect 1/57,000,000th of an ounce of mint vapor in a quart of air. That's roughly like tasting a spoonful of sugar dissolved in a large pond. The fact is, odor governs our buying to a surprising large degree.

So when it became known that consumers were smelling rubber products and saying, "There ought to be a law," these chemists recalled the one about supply and demand. They said to the manufacturers "Your goods will sell better if they smell better—and that's a plus value we can help you get."

The remedy was a series of aromatic compounds—the "Alamask" odorants. Unlike "cover-up" perfumes, these agents actually neutralize obnoxious odors.

During work on mattress reodorizing, Dunlop Tire and Rubber Co. added "Alamask" to latex in foaming kettle.

leaving a clean, almost odorless effect. The cost is only a fraction of a cent per pound of processed rubber.

Prior to 1940, considerable research already had been done in this field. Chemists were able to reodorize natural rubber for many different products such as sheeting, gaskets, girdles, insulators, washers and shoe adhesives.

SYNTHETICS RAISE PROBLEMS

Then came the war—and the synthetic rubbers. They were manna to our hard-pressed industries and to the public, but a pain in the neck to the aromatics people. Besides the vulcanizing and other processing odors, chemically-made synthetics had nasty chemical smells all their own.

The piece de resistance was sponge rubber. About two years ago sponge makers began mixing natural and synthetics. Their light, fluffy product, used in such articles as cushions and armrests, was wonderfully comfortable and practical. But its odor combined every disadvantage of both raw materials. Plus the odor of the chemical blowing agent sometimes used to produce the sponge. Plus the enormously greater surface area of blown products that give more opportunity for the escape of unpleasant aromas.

Such olfactory horrors kept Du Pont research men stepping. Not only did they have to destroy the chemical odor, but their compounds also had to pass the standard test of all good rubber-processing aromatics; they must be compatible with other chemicals and withstand high temperatures without changing. Working in cooperation with rubber technologists, the chemists rounded out their line of industrial masking

agents with such items as "Alamask" O and "Alamask" BG.

Today, with another emergency making natural rubber scarcer and more expensive, chemically-made rubber will be appearing more and more in our nation's rubber products. Du Pont aromatics men are always glad to help when the odor of any of these articles needs improving.

"There's just one type of situation that has us stumped," an aromatics expert told us. "It's the manufacturer who waits too long before he considers the odor problem. We have to get in on the ground floor—back at the early stages where the aromatics can be added along with other processing ingredients."

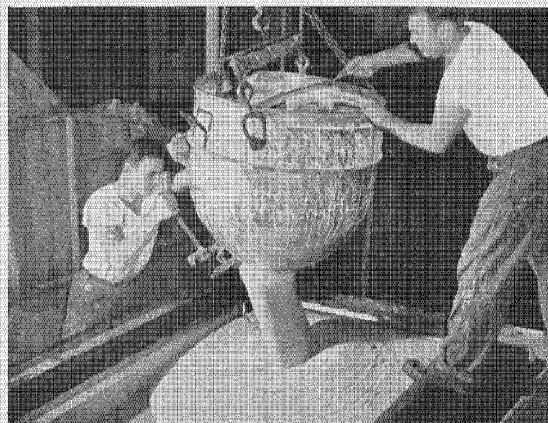
He told about a manufacturer who was coating the backs of broadloom rugs with a natural and synthetic rubber latex mixture, plus a moth repellent. Some of his rugs got into a New England house with modern radiant heating. The heat from the baseboards apparently drove the offensive smells out of the rugs and into the air. The home owner wanted his money back.

"As you can see," said our friend, "it pays a manufacturer to examine his raw materials, and find out as much as possible about how his product will be used. It's just as true for the maker of plastic shower curtains or aerosol sprays as it is for the rubber manufacturer. If there is a potential bugaboo, it should be caught early."

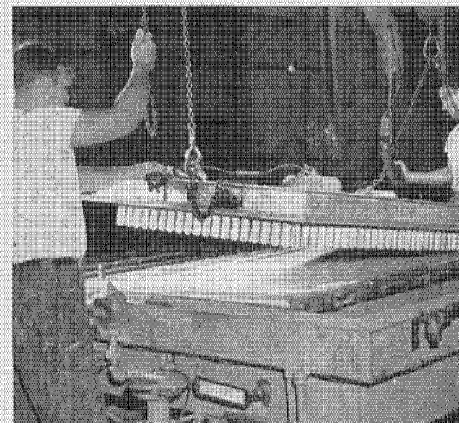
That sound advice is catching on quickly. No longer do industrial odors need to handicap sales or annoy the public.



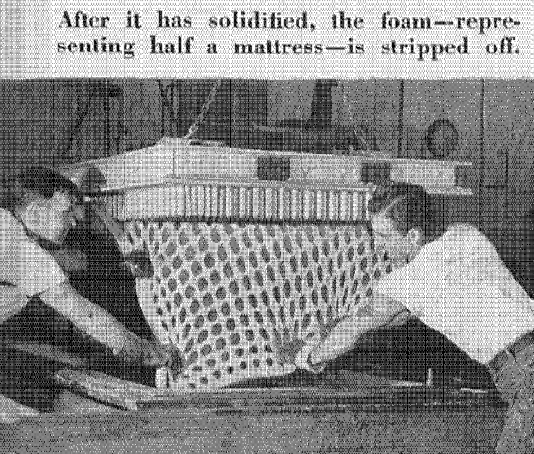
At Du Pont's New Brunswick, N. J., aromatics laboratory, rubber reodorants are tested.



In Dunlop plant, latex is foamed and poured into molds for articles such as mattresses.



Next, the top half of the mold is closed and steam heat "cooks" the rubber.



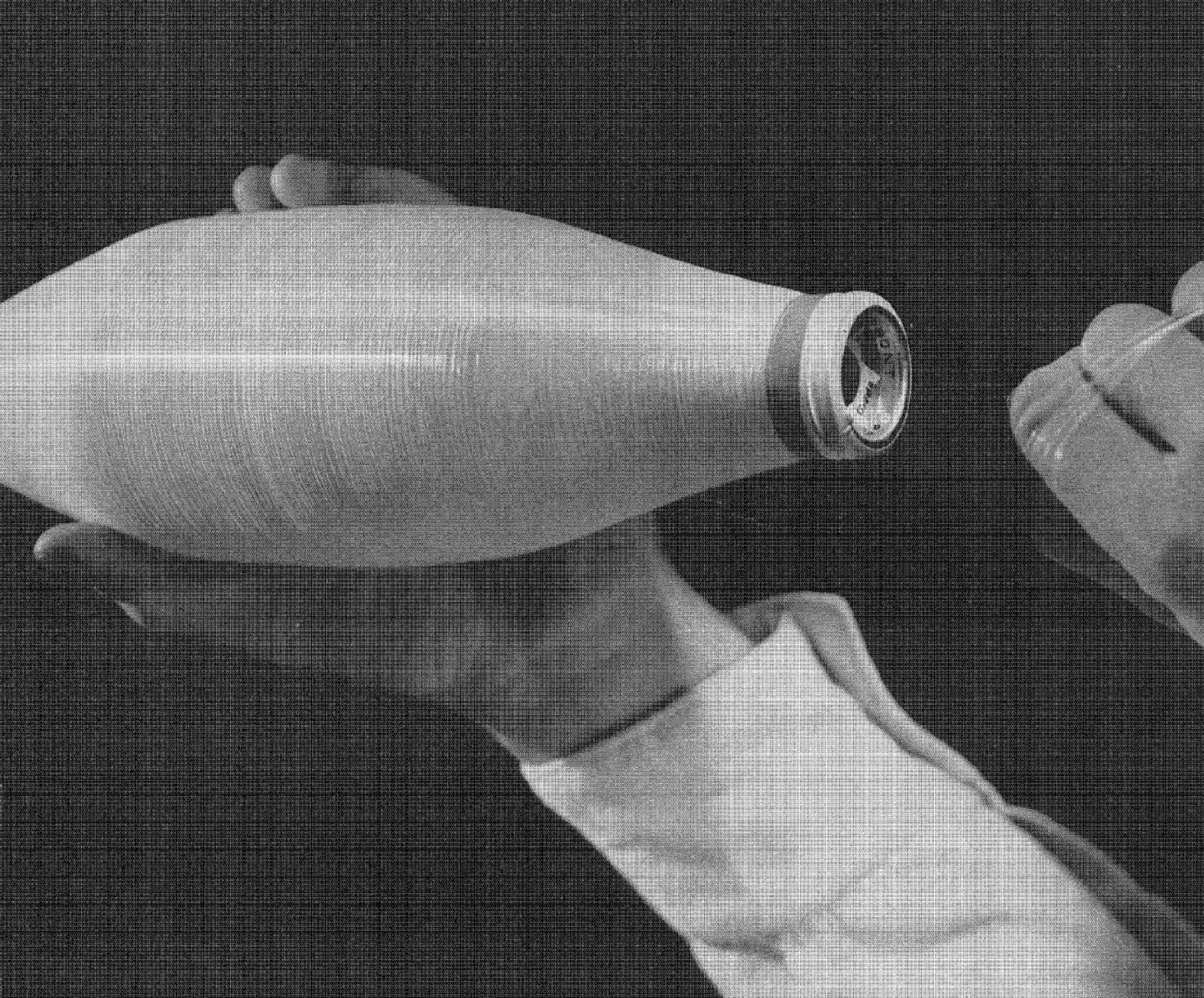
After it has solidified, the foam—representing half a mattress—is stripped off.



Steps such as centrifuging remove water and certain chemicals; "Alamask" stays intact.



Joining mattress halves together. Some hives for such jobs contain aromatics.



Bottles to bobbins

... or from jar tops to fuses; any way you look at it, "Cel-O-Seal" is working for many industries now

Businessmen with culinary leanings have lifted another trick from today's streamlined kitchen shelves and the food and drink trade. Their latest is the use in industry of "Cel-O-Seal" cellulose bands—those bright, colorful bands that have been used for years on bottled household goods to guard their purity and freshness.

The policing duty that "Cel-O-Seal" performs was what first attracted the attention of the Chase-Shawmut Co. Among the things this Newburyport, Massachusetts, company manufactures are glass-topped fuses for the home. One of the company's problems had been to protect fuses from chipping and then cutting people's hands. In March of this year, Chase-Shawmut's purchasing agent wrote to Du Pont, asking if "Cel-O Seal" bands would protect the fuses.

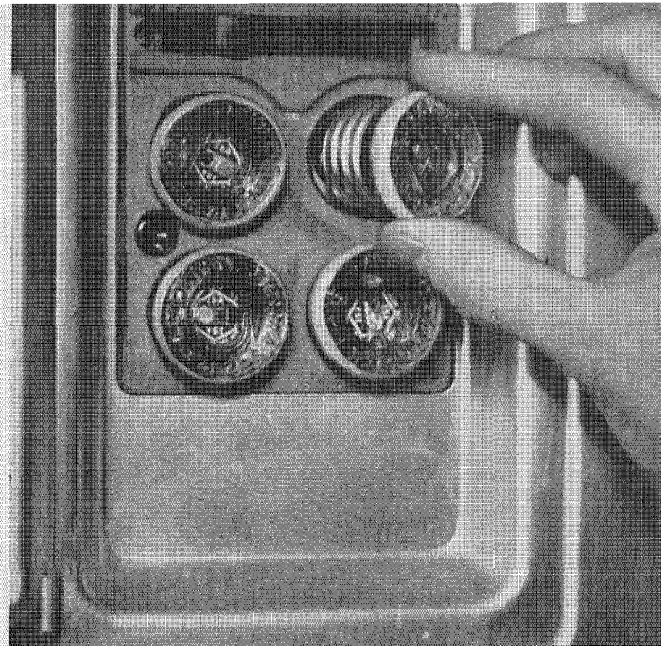
Here was an entirely new application, and it sounded like a good one.

Du Pont sales people studied the question. "Cel-O-Seal" in itself filled most of the requirements Chase-Shawmut had mentioned: as a protective jacket, it was easy to apply; it "stayed put" during shipping and handling, and it cost but a fraction of a cent per fuse. As an added advantage, the band was non-metallic.

Under actual trial tests, it easily filled all of the conditions, and soon you will be able to obtain these safely-jacketed fuses through your local dealer.

Chase-Shawmut has also helped dealers and their customers by using distinctive colors of "Cel-O-Seal" for its products. For example, a bright blue band quickly identifies the widely-used 125-volt, 15-ampere fuse. Orange, green and red bands indicate the capacity of others in this series.

Du Pont, too, is taking advantage of this "Cel-O-Seal" move to industry. When our Martinsville nylon plant recently started a large-scale test of a special yarn, a quick, easy identification method was needed to keep the special and standard nylons separate. "First, we thought of a tape for the end of the bobbins," Plant Manager W. D. Hartford told us. "But that would come off too easily. Besides, the yarn might have tangled in it. Painting the bobbins was another choice, but it's too permanent. Then 'Cel-O-Seal' bands were suggested, and they filled the bill exactly. When we complete the test, we'll remove the bands and the bobbins are O.K. for general use again." Should anyone want to conduct more than one test at the same time, the 20-plus standard colors available in "Cel-O-Seal" bands should be more than ample to keep the test results separate.



"Cel-O-Seal" bands serve a double purpose on glass-topped fuses. Fuse is protected against chipping when handled... and the band color identifies correct amperage for the job.

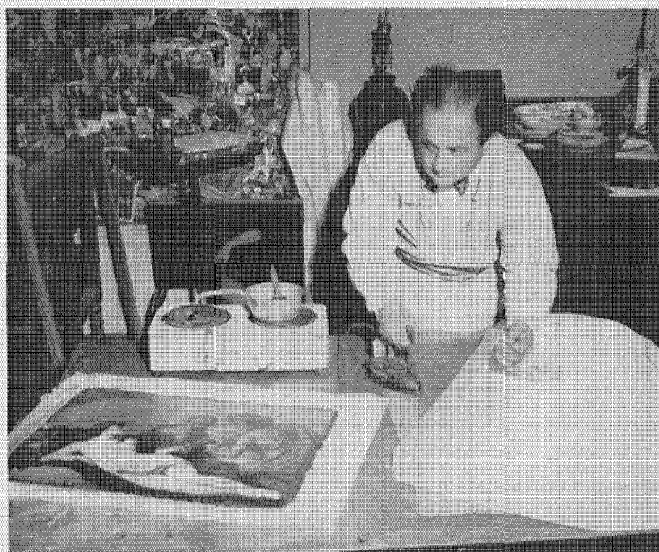
So these bright little bands, which have been doing such a good packaging job for the past 20-odd years, are now branching into other fields. Here they promise to continue the protective work for which they were designed. And their colorfulness and ability to carry consumer messages offer plus values to industry in identification and advertising.

Sun Oil uses these bands on industrial oil samples to hold the corks in place. They dress up the bottles, too.



What's New

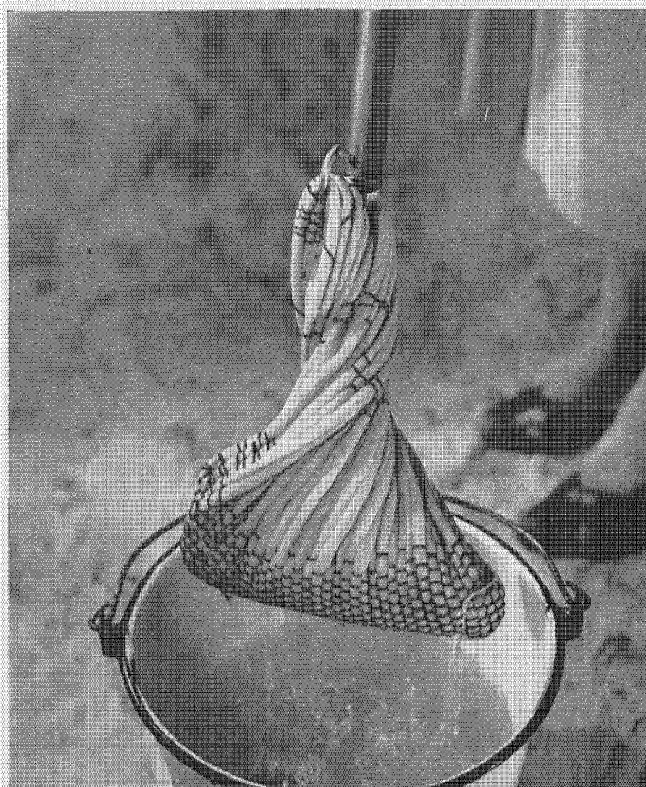
● **MORE NYLON YARN.** Du Pont has taken an option on a new nylon plant site of 635 acres between Kingston and Graingers, North Carolina. If the plant is completed in 1952, as planned, it will provide a large additional capacity for this yarn and provide about 1,200 new jobs. In the meantime, however, construction workers are building additional nylon manufacturing facilities at Seaford, Delaware, and Chattanooga, Tennessee.



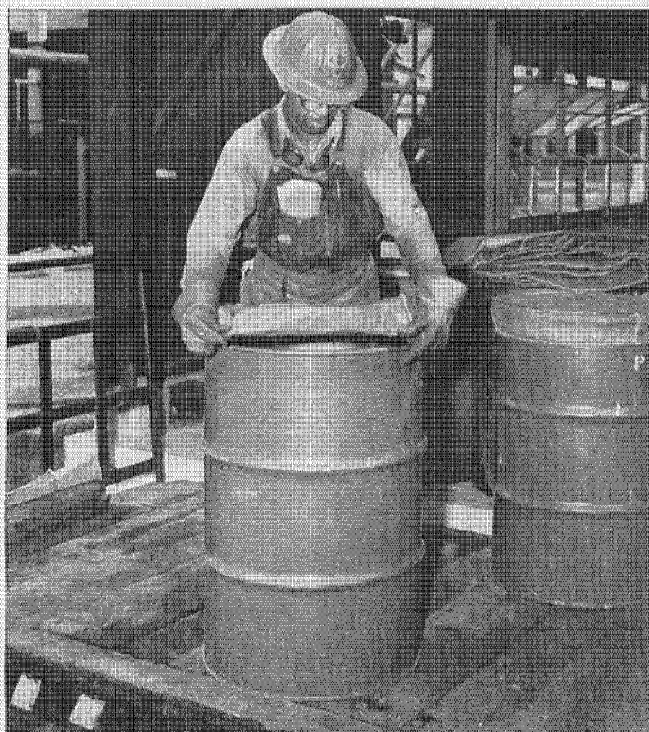
● **NEW CANVAS FOR ARTISTS.** Continuous-filament "Orlon" acrylic fiber is now being woven into canvas that is expected to have a service life many times longer than types available in the past. It is not subject to degradation from mold or mildew and the smooth, non-fuzzy surface helps to bring out live, pure color tones. This canvas, made by Acritex, Inc., 456 Fourth Avenue, New York, is winning acceptance by artists, and restorers of fine old paintings.

● **FOR CAR CARE.** A 43-page illustrated book, "The Serviceman's Manual on the Automotive Cooling System," helps dealers put car cooling systems in top shape for winter and summer driving. It is sold by "Zerone"- "Zerex" antifreeze jobbers to automobile servicemen.

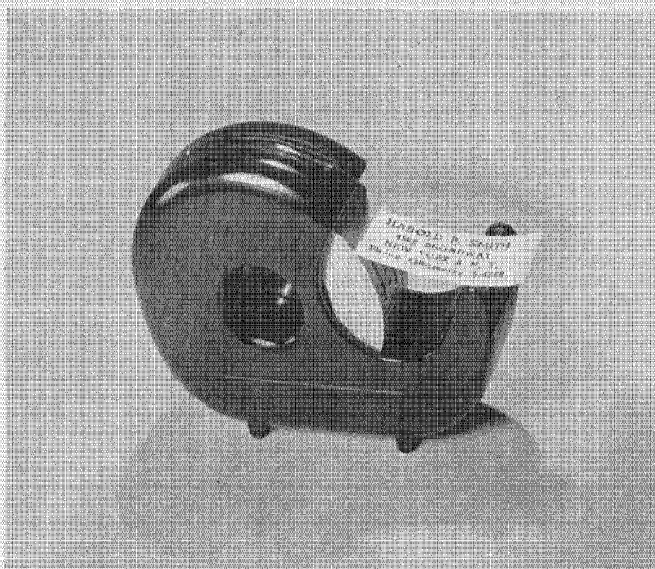
● **"FREON" 12 AND "FREON" 114** fluorinated hydrocarbon refrigerants are being packaged in one-pound cans that contain enough to recharge a home refrigerator and may be thrown away after use. The refrigerant is packaged by the Eston Chemical Company, 3100 E. 26th Street, Los Angeles 23, Cal., a distributor for the "Kinetic" Chemicals Division of Du Pont's Organic Chemicals Department. Repairmen no longer need to carry along heavy cylinders of the refrigerant when making service calls where small amounts of refrigerants are needed.



● **"BETTY BRIGHT" MOP,** made of Du Pont cellulose sponge yarn, can be wrung out by twisting a handle at the top. This, of course, keeps the hands dry. Du Pont sponge yarn is ideal because it absorbs two to three times as much water as ordinary mops, rinses clean, and does not develop a sour odor. The mop is made in Warren, Ohio, by the Parker Manufacturing Co.

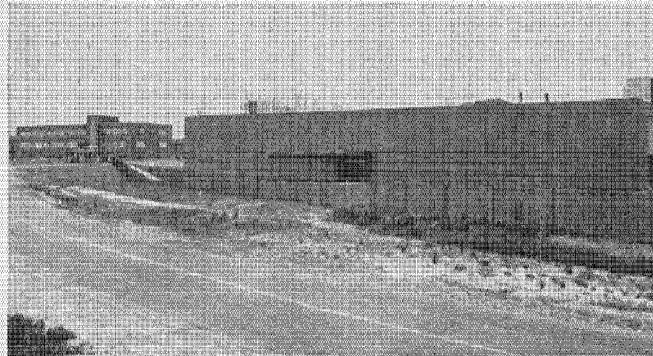


● **THIS DRUM COVER**, made from paper containing neoprene, is designed to keep dry materials in good condition during intraplant shipment or while in temporary storage. At Du Pont's Chambers Works plant, the new covers have given more service per dollar than wooden barrel heads or metal drum lids, because they are easier to get on and off and cost a great deal less. Neoprene, Du Pont's chemical rubber, imparts to the cover an unusual toughness, high wet strength and oil-and-acid resistance. The Chase Bag Company, 1500 S. Delaware Ave., Philadelphia, is the manufacturer.



● **PERSONAL STICK-ON NAME TAPE**. The Transparent Products Company of 324 East 24th Street in New York is manufacturing handy rolls of personalized labels printed on Du Pont cellulose acetate film. They can be used to identify property, and will stick to almost anything from golf clubs to books and bottles.

● **NEW PRODUCT FOR DRY CLEANERS**. "Aridex" DCN renewable water repellent for dry cleaners using petroleum-type solvents has recently been announced. The new "Aridex" DCN produces unusually high repellency on garments and is also easy to use. For information about the product, write D-5, Du Pont Textile Service Section, 40 Worth Street, New York City.



● **A NEW DU PONT LABORATORY** devoted to research and development work in the field of photographic films and processes was recently dedicated at Parlin, New Jersey. Among the primary objectives of the scientists in the new laboratory, built at a cost of more than \$1,000,000, will be improvements in color photography and new development processes for both color and black-and-white film.



● **BABY KIT**. Another interesting use of polythene molding powder is for the baby's toiletries. Polythene bottles are ideal containers for powder and lotion, for there's no chance that they will break if knocked over by the baby. The bath kit is distributed by Botany Mills of Passaic, New Jersey.

WANT ADDITIONAL INFORMATION? In a recent survey, many of you asked how to find out more about the products and services mentioned in our articles. If you will write the Editor, Du Pont Magazine, Wilmington 98, Delaware, we will be glad to see that your inquiries are handled promptly.

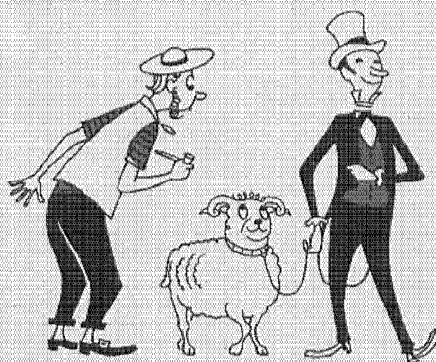


Did you know

... **CONSTRUCTION** of a new unit of the May Plant at Camden, South Carolina, is now underway? This plant for manufacturing "Orlon" acrylic fiber in staple form will create about 1,000 new jobs when completed.



... **CELLULOSE SPONGES**, designed especially for bath and general household use, now come in four colors—yellow, coral, green and blue—to complement the color schemes of bathrooms and kitchens? These new sponges are softer in texture than Du Pont's present line of sponges.



... **THE FIRST EFFORT** to improve American wool—"to render it more fit for superfine fabrics"—was made about 1801 when E. I. du Pont de Nemours, founder of this Company, and a French banker, Mr. Delessert, brought to this country a full-blooded ram named Don Pedro? This can be taken, says the *American Wool Handbook*, as the beginning of better blood lines in American sheep.

... **SPRAYING FORMALDEHYDE** on equipment, benches, walls, floors, and ceilings of oyster packing houses controls "pink yeast," a fungus which gives the oysters an unattractive pink color and makes them less valuable?

... **A COMPLETE LINE** of ammunition for law-enforcement agencies is made by the Peters Cartridge Division of the Remington Arms Co., Inc.? Included are the well-known "Police Match" 22, 32, 38 and 45 caliber pistol and revolver cartridges.



... **AMONG THE EARLY "Cavalcade players"** who have since achieved fame are Agnes Moorehead, Kenny Delmar, Orson Welles and Richard Widmark?

... **NEARLY HALF** of the manufacturing establishments in the United States employ less than 10 persons each, the United States Census Bureau reports.



... **SIR HUMPHREY DAVY'S DISCOVERY** that the tannin in oak bark was the substance that changed hides and skins to leather was the first scientific step in the tanning industry?



Bombers taking off from rural England to raid the enemy . . one of about 1,000 paintings and photos in new picture history of war.

From "Fabrikoid" cover to "Fabrikoid" cover, this history is a candidate for

The biggest best seller

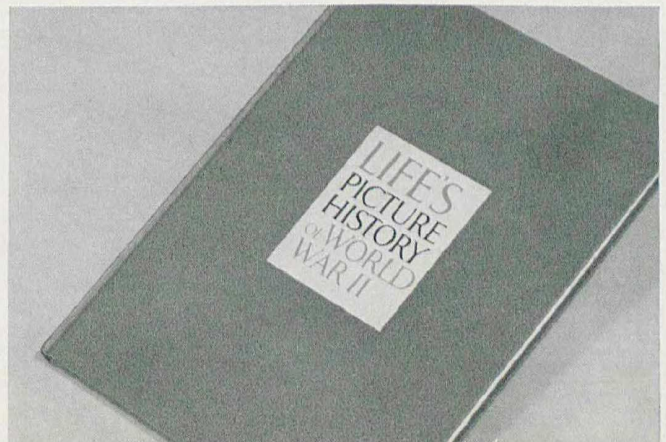
An important event in the publishing business took place recently with the printing of "*LIFE's* Picture History of World War II." Nearly half a million copies have already been sold to *Time-Life* subscribers, necessitating the largest first printing in the history of book publishing.

The 376-page volume combines the vividness of the camera, the authority of history and the interpretation of experts. It is the story of the great conflict, from Britain's desperate, lone stand against the Wehrmacht, through the dark succession of Japanese conquests, to the climax of Normandy.

A staff of 18 editors, artists, writers and researchers began work on the volume last March. Some of the facts and many of the pictures have never before been published. Nearly half a million illustrations were reviewed before about 1,000 were selected. Included among the 64 pages of full color pictures are reproductions of paintings captured from the enemy.

Knowing that such a book will be an important

part of home reference libraries, the publishers chose a binding for its durability as well as appearance . . . Du Pont "Fabrikoid" pyroxylin coated fabric. It was chosen for the library edition because "Fabrikoid" stands up so well under repeated handling without showing wear, and it has frequently been chosen for bindings of dictionaries, histories, encyclopedias and other reference books. From all indications this important volume will be in use for a long time—and "Fabrikoid" will protect its appearance just as long.





The background of the advertisement is a vibrant collage of various fabrics. There are sections of green fabric, purple fabric, and a patterned fabric with green, yellow, and pink floral or abstract designs. A pair of large, silver-colored scissors is positioned diagonally across the center-right of the image. Several sewing pins are scattered around the fabrics. The text is contained within a white, torn-edge rectangular box in the lower-middle section.

Colors that Start Bright . . . and Stay Bright

Colors that keep their original bright shades during the life of the garment give real customer satisfaction. That is why more and more fabrics are being dyed or printed with lasting Du Pont vat and other fast colors.

These colors keep their newness through laundering . . . dry cleaning . . . exposure to sunlight.

Whenever you have a dyeing problem, come to Du Pont. The Technical Staff is ready to help you select the proper dye for full fabric serviceability.

E. I. DU PONT DE NEMOURS & CO. (Inc.), DYESTUFFS DIVISION
Wilmington 98, Delaware



BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Du Pont Card