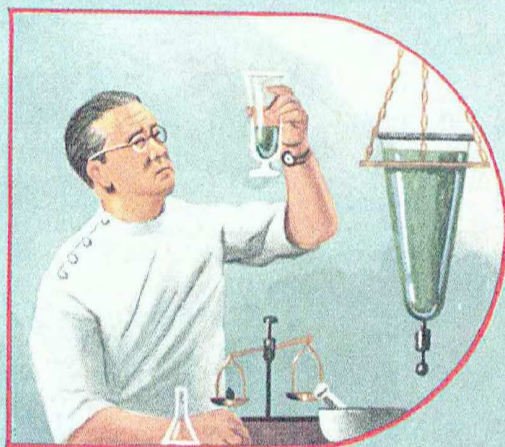


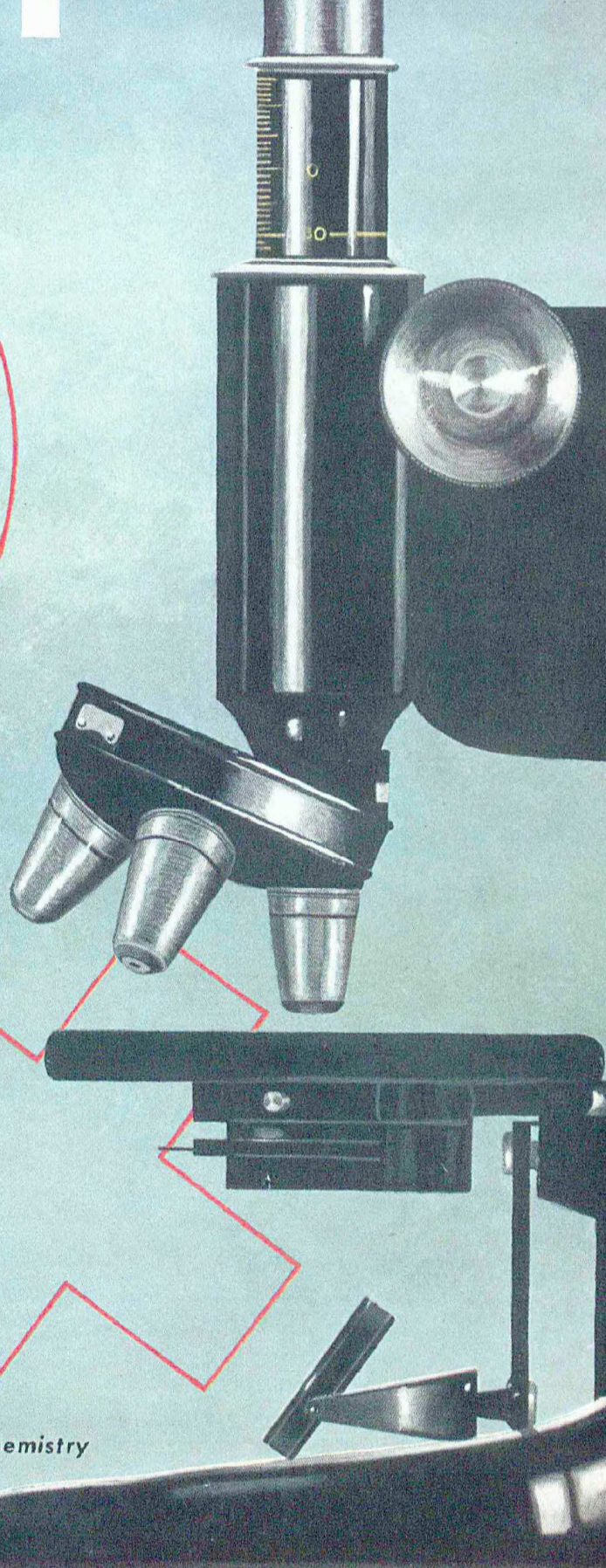
DECEMBER 1951 • JANUARY 1952



pharmaceutical industry



Better Things for Better Living...through Chemistry



It's NEW



COURTESY BETTER HOMES & GARDENS, EMMIE DANIELSON NICHOLSON, PHOTOGRAPHER

Du Pont "Dulux" Super-white Flat Enamel

REG. U.S. PAT. OFF.

adds new richness to fine interiors



Imagine the rich, velvet beauty of a flat finish, combined with the practicality you've come to expect from DULUX Super-white Enamel. That's what you get with Du Pont's new DULUX Super-white *Flat* Enamel. No enamel like it has ever been made!

This remarkable new wall and woodwork enamel dries overnight to a tough, washable surface. It brushes easily—has high hiding power. Its snow-white finish *stays* white. Or, if you prefer, it can be tinted to light pastel shades with Du Pont Oil Colors.

Pretested by Du Pont chemists, field-tested all over the country, DULUX Super-white Flat Enamel is now available from your local Du Pont paint dealer. He'll be glad to answer any questions you may have about using it.



REG. U.S. PAT. OFF.

PAINTS

for every purpose

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



The land of plenty

You've seen the phrase in print; you've heard it a thousand times—especially around Thanksgiving. You've probably used it yourself: "The United States is the land of plenty."

What is plenty? What does it mean? Does it mean that everybody has every last thing he wants? No, that would be downright silly. When we say America is the land of plenty we mean that more people here have more than any other people in any other country have ever had.

We produce more; therefore we have more. How do we do it? Other countries have more natural resources than we have. Still we out-produce them. What is our secret?

The answer seems to be that there is no *one* secret unless it is what we call the American way of life. One ingredient of "The American Way" is that Americans

are willing to take a chance in order to earn a possible reward. Our people truly welcome new ideas. Seeing a chance for profit, someone eagerly goes ahead and develops them. That is what happened with the phonograph, the electric light, the automobile; thousands of other things. Sometimes it took only a few dollars. Sometimes it took millions, as with products of chemical science like nylon or cellophane. But in every case, someone went confidently ahead with an idea.

Can it be that the American secret lies in the words "confidently" and "profit"? An American manufacturer with a chance to make a good profit on a good product can afford to try out new ideas—with confidence. He is willing to risk his time and money on new ideas that promise to be profitable. And he does it with confidence because our American way protects the ideas and profits of individuals and of companies.

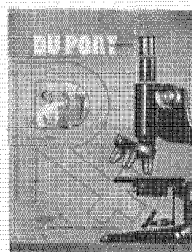


BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

JAMES H. MCCORMICK, *Editor*

Vol. 45 No. 6

Associate Editors, MARGARET MINER
GORDON H. KESTER



OUR COVER: This issue brings to a close our series of industry covers begun in 1947. Our first one saluted the automobile makers, and we conclude with a respectful bow to the pharmaceutical industry. Drug and medicine manufacturers buy many Du Pont chemicals for use in their manufacturing processes,

but there is an even more important reason for including them in this series. At times our lives literally depend on them and on the purity and strength of their products.

Artist Capo Bianco explained that the microscope symbolizes the industry's spirit of progress and

research, and the man in the white coat typifies the neighborhood pharmacist.

We asked about the holes in the wood. "That," he said, "is artistic license, pure and simple."

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Hexamethylenetetramine's 9+ lives

It's hard to pronounce, but important for drugs, fuel tablets, plastics, cork products and decay-resisting oranges

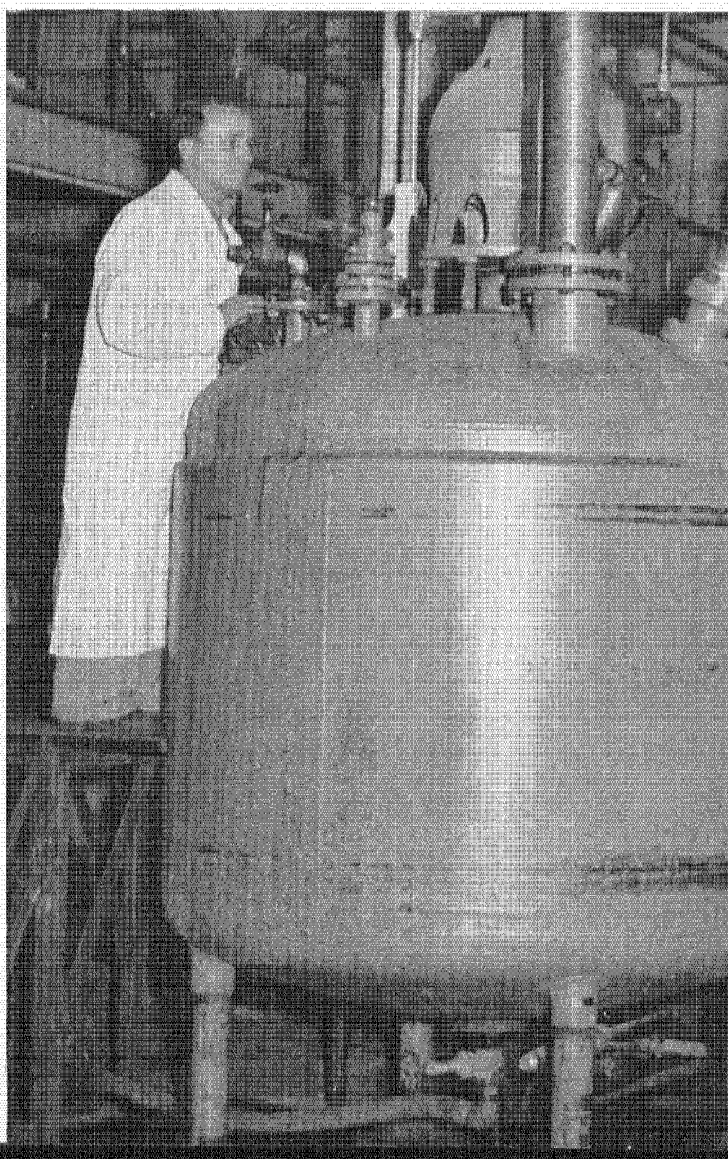
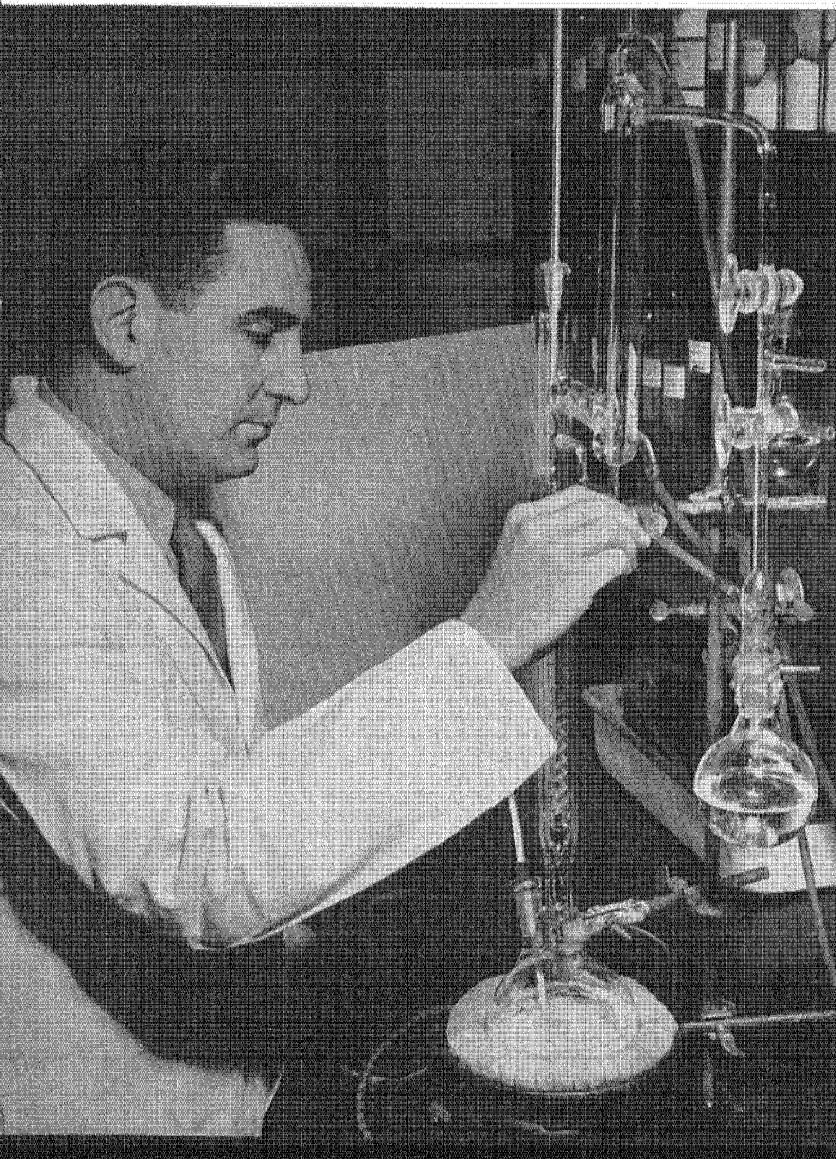
"Prognosis: Death." That's what doctors were saying about Gregorio Zalles four years ago, as he lay in a coma in a Bolivian hospital. His death certificate was complete except for the date, and burial had been arranged. Exhausted by fever, he was one of scores struck down by a typhus epidemic.

Then came the chance visit of Dr. Eugene H. Payne of Parke, Davis and Company, Detroit. Payne was being honored by the Bolivian government for war work, and was just about to leave for South America when word of the epidemic reached him.

At that time, scientists at Yale working under a Parke-Davis research grant, along with Parke-Davis researchers, were hot on the trail of a new drug. This "Chloromycetin" chloramphenicol, produced from a mold originally found in Venezuelan soil, had also been studied by Army doctors. Everyone was enthusiastic, but there had been no clinical trials.

Here, thought Payne, was a good chance to see what "Chloromycetin" would do. He took with him almost all of the drug then available—roughly half a pound. When he reached Bolivia, the pitifully small

Much credit for synthetic "Chloromycetin" is due Dr. Loren Long, left. At right, a view in Parke-Davis plant.



eral Hospital.

Gregorio Zalles was one of the lucky 22 patients—all seriously ill and some on the verge of death—who were treated. Forty minutes after he got his first dose, he asked for water. He's been talking ever since, with possibly some well-chosen words for the undertaker who was so over-prompt with his death certificate. All of the treated cases recovered. Among the 50 untreated ones, 14 died.

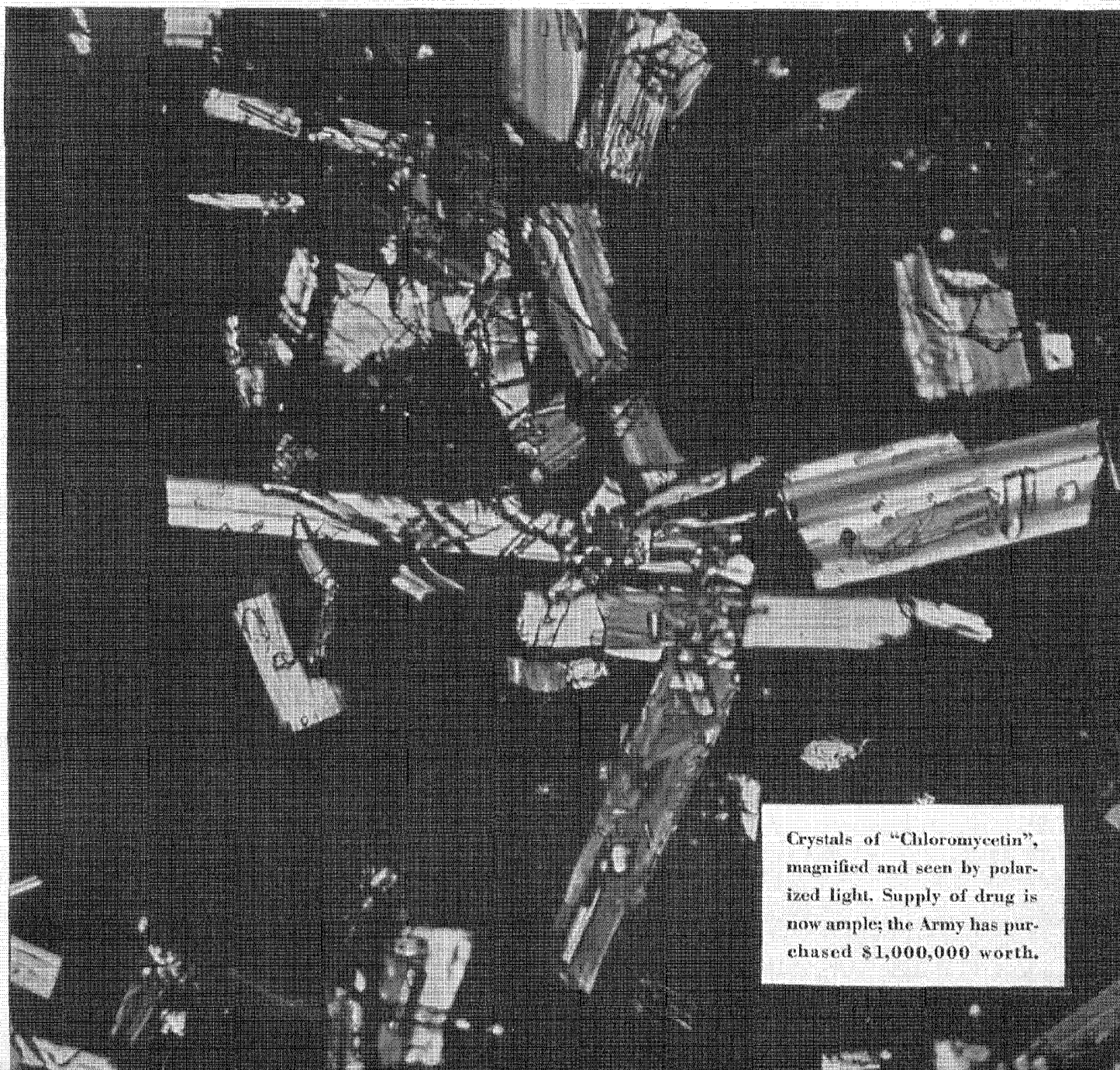
Today "Chloromycetin", although no cure-all, has a well-established place among the wonder drugs. It is used against a variety of diseases besides typhus; among them, whooping cough, typhoid, Rocky Mountain spotted fever, undulant fever, and primary atypical pneumonia.

But this antibiotic has one claim to fame shared by no other. It is the first and only one to be synthesized chemically by a commercial method. The man-made product is identical with the one produced by

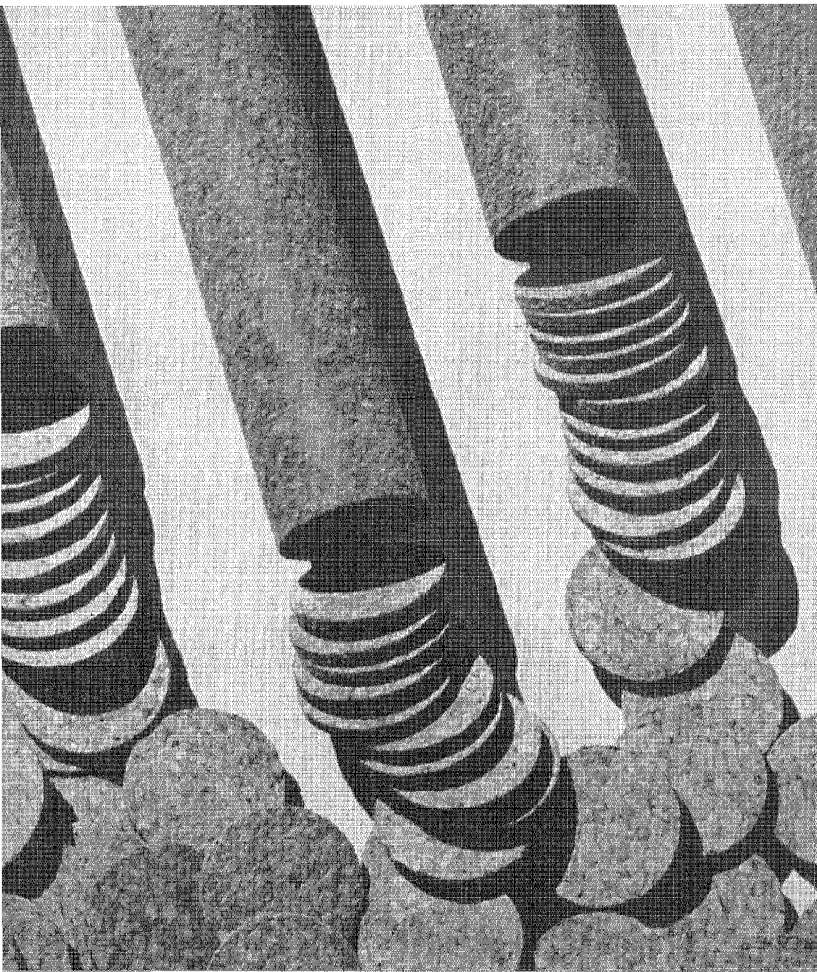
synthetic process turning out "Chloromycetin" quickly and efficiently in ton quantities, the days of the disheartening words "there isn't enough to go around" are past. About 90 per cent of the present supply is made in the newer, less expensive way.

"One chemical we use in this process is hexamethylenetetramine," reports Dr. Loren Long, to whom goes much credit for the commercial success of synthetic "Chloromycetin". "We are now using several thousand pounds of it a week, and that will grow as our new facilities at Holland, Michigan get into full operation. All of the drug made there will come from chemicals, including the hexamethylenetetramine we buy from Du Pont."

The versatility of hexamine, as this jawbreaker is known, is an old story around Du Pont. For years customers have used it to make the phenolic resins that go into camera cases, telephone hand sets, washing machine agitators, and radio and TV cabinets.



Crystals of "Chloromycetin", magnified and seen by polarized light. Supply of drug is now ample; the Army has purchased \$1,000,000 worth.



Sealing discs for bottle caps, cut from composition cork rods, are representative of cork products made with the help of Du Pont hexamine.

Hexamine is also useful for hardening glue, gelatin and casein to make them more water-resistant.

Many of hexamine's jobs stem from the fact that it reacts chemically like formaldehyde, but does so more slowly. This is especially important in making phenol-formaldehyde plastics. In this case, the full amount of formaldehyde usually isn't added to the mixture in the beginning, because the plastic might harden too soon. By making up the formaldehyde shortage with hexamine, a molding powder that hardens at the right time is obtained.

Other times, when hexamine is used in place of formaldehyde, it's a question of smell. To anyone who doesn't appreciate working around an embalming-fluid odor all day, hexamine is a big relief.

Down in Florida, a new use for this compound is going into commercial operation—helping protect citrus fruit from early decay. Here, the actual decay reducer is another chemical, but when used alone it can damage the fruit. So researchers, working on a joint project of the Florida Experiment Station and the Florida Citrus Commission, looked for a way to prevent this trouble. The answer lay in using hexamine along with the other compound.

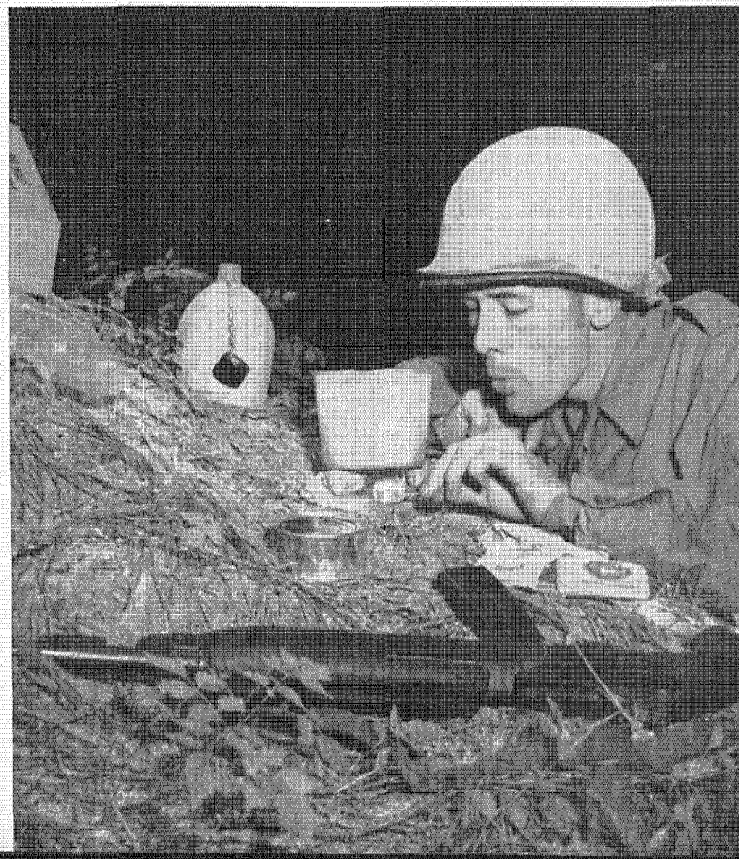
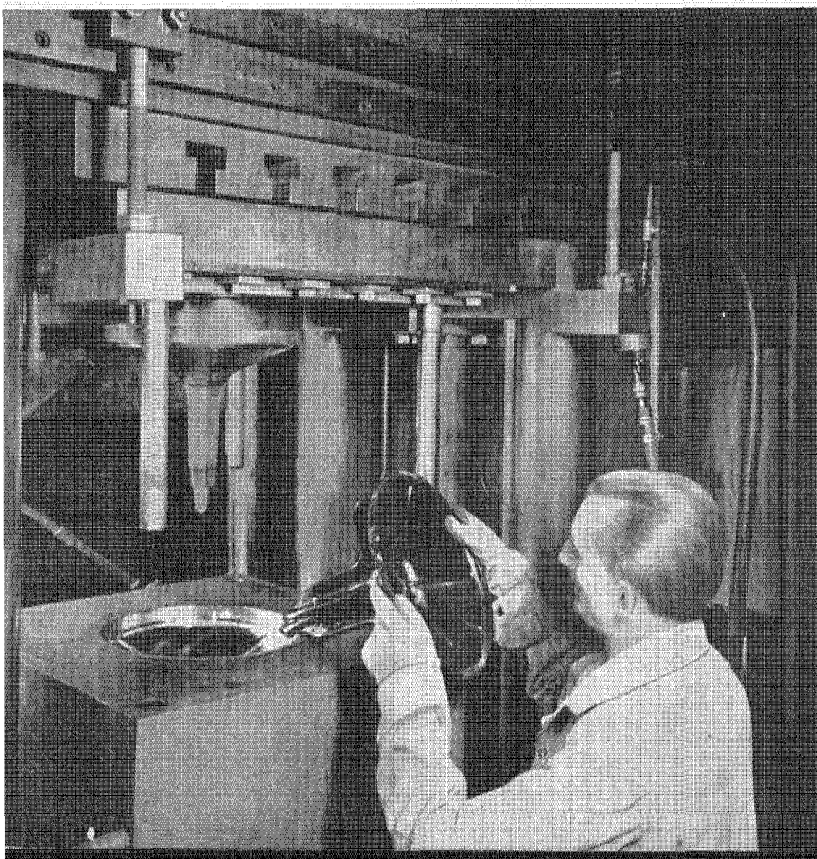
"Hexamine," concurs a horticulturist of the Department of Agriculture at Orlando, Florida, "is an effective safener for the decay-reducing chemical." It's predicted that the new treatment will save the citrus industry hundreds of thousands of dollars in the future.

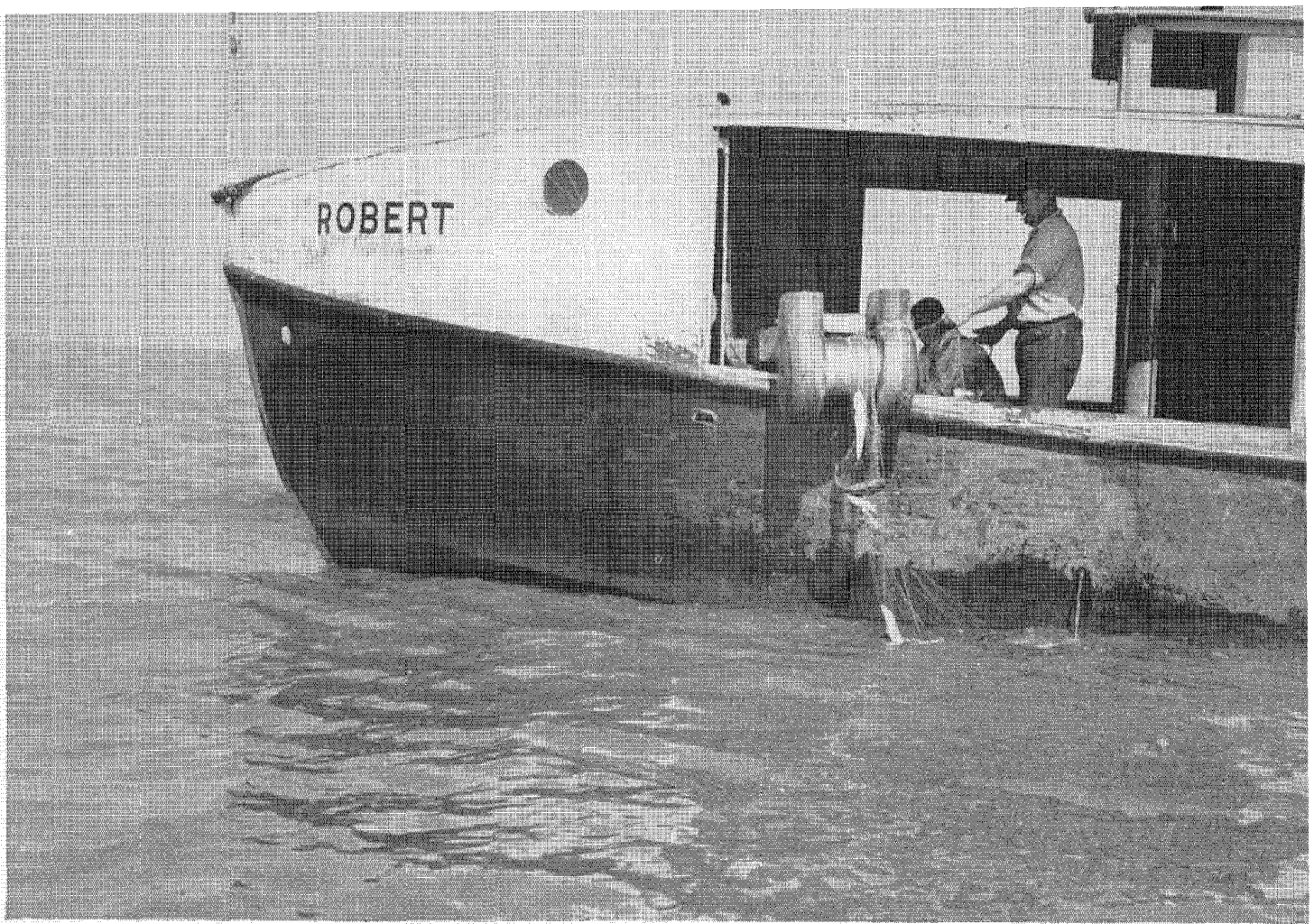
Meanwhile, men of Du Pont's Electrochemicals Department are looking for still other ways in which that chemical jack-of-many-trades, hexamine, can serve their customers and the public.

4

"A chemical timer"—that's what you call hexamine in the manufacture of phenol-formaldehyde items like washing machine agitators.

Formed into tablets, hexamine provides soldiers with a convenient fuel for warming food. The chemical burns with hot flame.





This nylon net, used to fish Lake Erie, has boosted business for Capt. Morris Wick.

Caught for keeps

Nylon cast upon the waters, we said in our November-December 1948 issue, has a way of returning in remarkably good shape. At that time we were speaking of East coast fishermen and the problem of rotting they were solving with nylon nets, which can be stored away wet. And we reported on the nets' lightness, which makes for easy handling and compact storage.

Since then we've heard from another group, the fresh-water fishermen who haul whitefish, walleyes, perch, chubs and trout out of the Great Lakes. And we've received about a dozen reports, from Florida and New York to Michigan and Wisconsin, on a subject that warms any businessman's heart—big jumps in production. These reports come from a survey sponsored by two of the companies concerned with turning nylon into nets—Heminway and Bartlett Manufacturing Company of Watertown, Connecticut, and Brownell and Company, Inc., of Moodus, Connecticut.

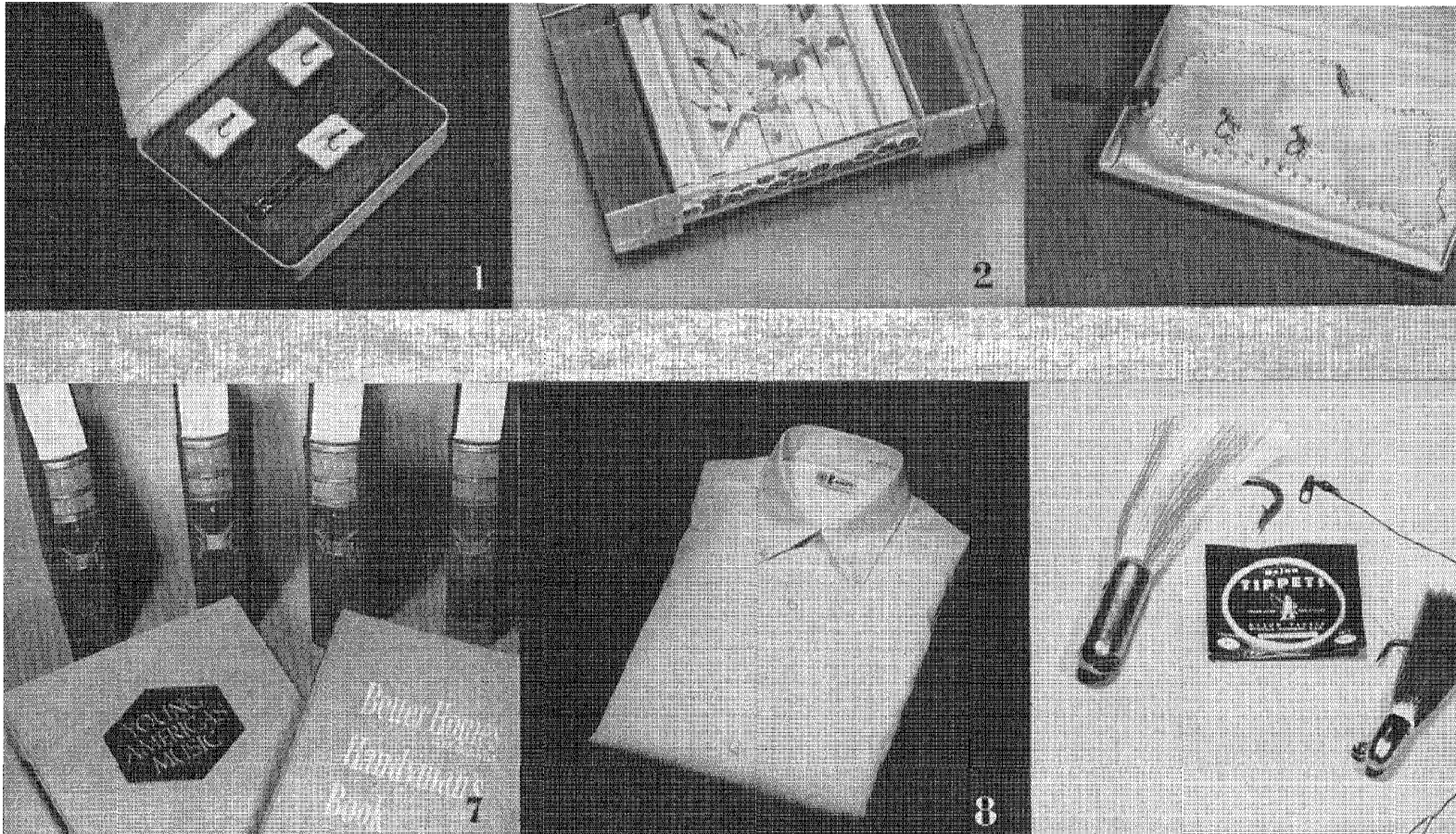
"When it comes to catching more fish, nylon's about three-to-one better than other nets," Frank

LeClair of Two Rivers, Wisconsin has said. For about two years, he's been landing chubs with a "Nylock" net jointly developed by Heminway and Brownell.

Arthur Lasanen of Lake Linden, Michigan, who used both cotton and nylon last year, estimates that his hauls went up 25 per cent with the "Nylock." And Captain Morris Wick of Sandusky, Ohio reports, "I've used nylon all of this season and part of last season. It's the best improvement in our business that could be. It catches considerably more fish on the average."

All in all, one thing is certain. Nylon nets are extremely strong, and that makes it hard for a struggling fish to get free. Even a six-foot, 100-pound sturgeon can't battle his way out, we hear from a New York shad fisherman, who adds, "We are sure we would have lost this fish had we been using one of the other nets."

A few nylon users lament that the nets are catching too well; it's hard to remove the fish once they're snared. But if that's a fisherman's worst trouble, it sounds like he's in the nautical equivalent of clover.

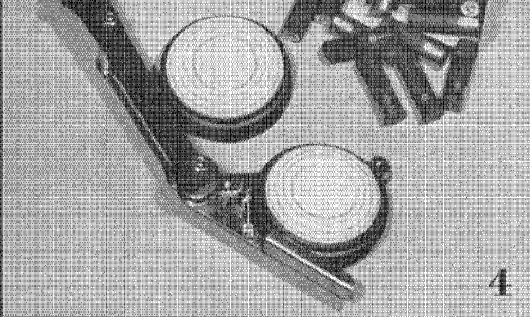


Chemicals for Christmas?

No thanks, you say—but wait a minute. All of the gifts on these two pages owe something to chemistry. We often aren't aware of it, because chemicals have a way of turning into other things before they reach store counters. Actually, only a few items pictured here carry the Du Pont Oval; the rest are woven of, molded from, painted with, or in some other way related to Du Pont products. We hope one or more of them will be the answer to the question marks on your Christmas shopping list.

- 1 TIE CLASP and CUFF LINKS. Miniature red trout flies embedded in "Lucite". Made by Hickok.
- 2 TABLE CIGARETTE BOX. Made of Du Pont "Lucite" by Shoreham Mfg. Co. of Winfield, N. Y.
- 3 PEARLS. Made of "Lucite" acrylic resin by Richelieu, New York City.
- 4 HAND TRAP—TARGETS—SHELLS. Such Remington items are popular gifts for sportsmen.
- 5 JACKET. "Zelan" durable water repellent, fleece of "Orlon", nylon fabric feature McGregor jacket.
- 6 DOLL. Goldberger's "Eegee" doll has arms and legs of washable neoprene, Du Pont's chemical rubber.

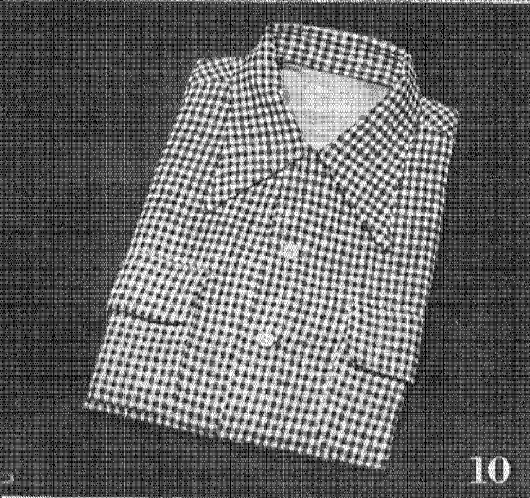
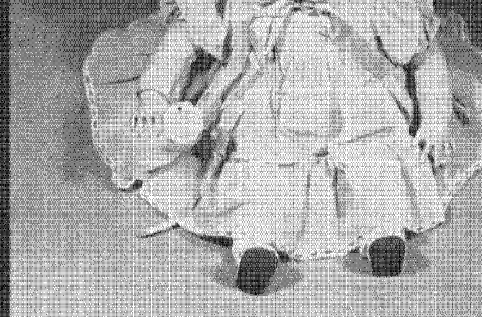




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11



7 BOOKS. Scribner's, *Better Homes and Gardens* protect these books with durable Du Pont coated fabrics.

8 SHIRT. Made of "Dacron" polyester fiber by Raab Meyerhoff, N. Y. C.

9 FISHING LURES and LEADERS. Made of nylon monofilament.

10 VISCOSE RAYON-WOOL SPORT SHIRT. Tailored by McGregor.

11 ROBE. Of "Acele" acetate rayon. Sold by Wallachs, New York.

12 CHINA. Lenox's "Harvest" pattern, decorated with Du Pont ceramic gold.

13 HOME FREEZER. Du Pont supplied enamel and "Freon" refrigerant.

14 LUGGAGE. Of "Fabilite" vinyl plastic material. Gralnick Bros., Inc., Philadelphia is the maker.

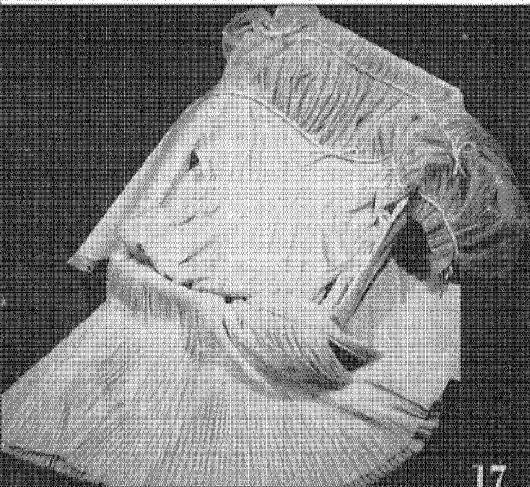
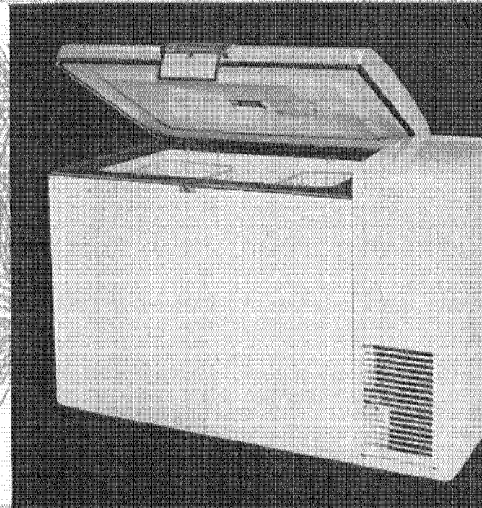
15 BRUSH and COMB SET. Made by Du Pont for the baby.

16 SOCKS. Of "Orlon" acrylic fiber.

17 NIGHTGOWN. Easily-laundered nylon lingerie is an ideal gift.

18 PHOTOGRAPHIC FANS. Kit contains "Varigam" variable contrast photographic paper.

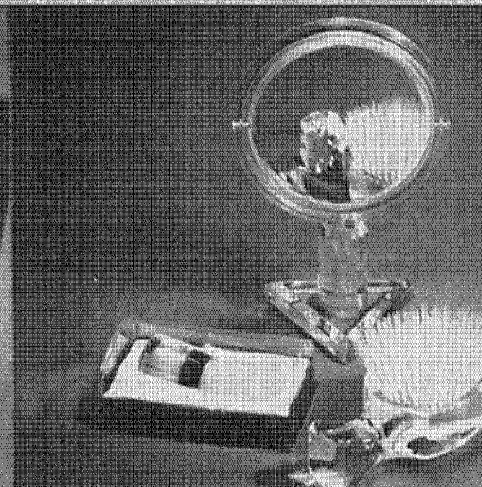
19 GROOMING AIDS OF "LUCITE". Nylon-bristled "Ever-Ready" shaving brush and Shoreham hairbrush. Shoreham mirror.

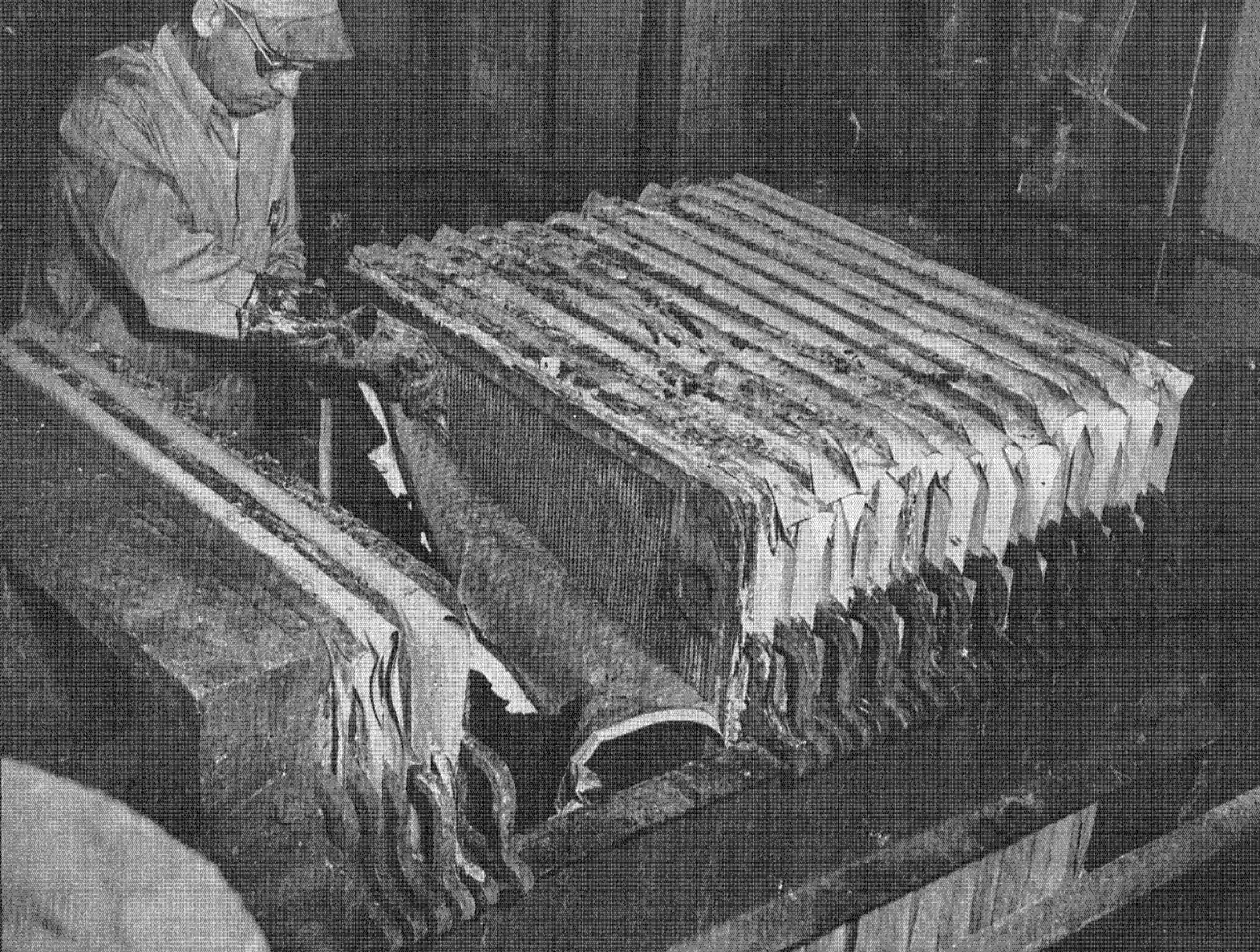


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18





Problem: how to cut industry's filtering costs. Possible solution: use a newly developed neoprene-treated paper filter.

Get it on paper...

*the challenge faced by neoprene chemists
in bringing about the union of
rubber and paper*

Chemistry's latest contribution to papermaking is the successful union of paper and neoprene, Du Pont's chemical rubber. Today more than 50 products are being eyed by Du Pont chemists as likely beneficiaries of this new partnership. Multiwall bags, artificial leather bases, carton liners, dimensionally stable printing paper, disposable waterproof tarpaulins, filter pa-

pers, and paper barrel covers appear to be about ready for the civilian market. Others aren't so far along, and need more working over.

After spending several years and more than \$1,000,000 for research, Du Pont feels that two processes for combining neoprene latex with cellulose are in a fair state of perfection.

In one of them, formed sheets of paper are saturated with a neoprene dispersion. In the other, latex is mixed with the pulp before the sheet is formed. Paper, in the process, becomes a complete changeling.

Paper with neoprene latex added, for instance, has greater tensile strength, both wet and dry; it has better impact and shock resistance, and increased

bursting strength; it takes on marked folding endurance (might be fine for maps!); its internal bond strength and scuff resistance are greater: all without cutting down smoothness, gloss, and tear resistance.

Du Pont doesn't make any of the papers we've mentioned. But it is standard practice for the Du Pont technical people to sweat out, along with paper manufacturers, the solution to problems of producing papers for special jobs. One new product of particular interest to manufacturers, for example, is a neoprene-treated filter paper. The history of its development is typical of several of these new neoprene-paper combinations.

BIRTH OF A PRODUCT

In 1949 Du Pont chemists were on the trail of a paper substitute for expensive canvas duck filter cloths. Progress was slow, and they were having only mediocre success. They needed a paper with rather miraculous properties. It must, they figured, retain much of its strength after long soaking in water, acids, and other chemicals. Quite an order when even the finest cloths didn't always measure up to these rigid specifications.

The chemists had been working with a special latex, a milky-white emulsion of neoprene. The tiny rubber particles deposited on the paper fibers in the pulp stage, they had found, acted as a waterproof binder and added physical properties to the paper that could be obtained in no other way. However, it was necessary to produce these properties without loss of permeability if they were to have a good filter paper. To cut it short, a mill is today producing a neoprene-treated filter paper that appears to be an adequate substitute for canvas duck.

Engineers at the Du Pont Chambers Works at Deepwater, New Jersey are using it in several operations as a complete or partial replacement for cotton filter cloth. The cost of the paper is 5.1 cents a square yard. Cotton duck costs 75 cents a square yard. The



Du Pont neoprene latex is used as a binder in flexible backing felt of Sloane-Blabon "Trenwall" wall covering.

people guiding the project feel that the annual \$151,000 outlay for filter media—duck, synthetic fiber fabrics, etc.—can be substantially reduced.

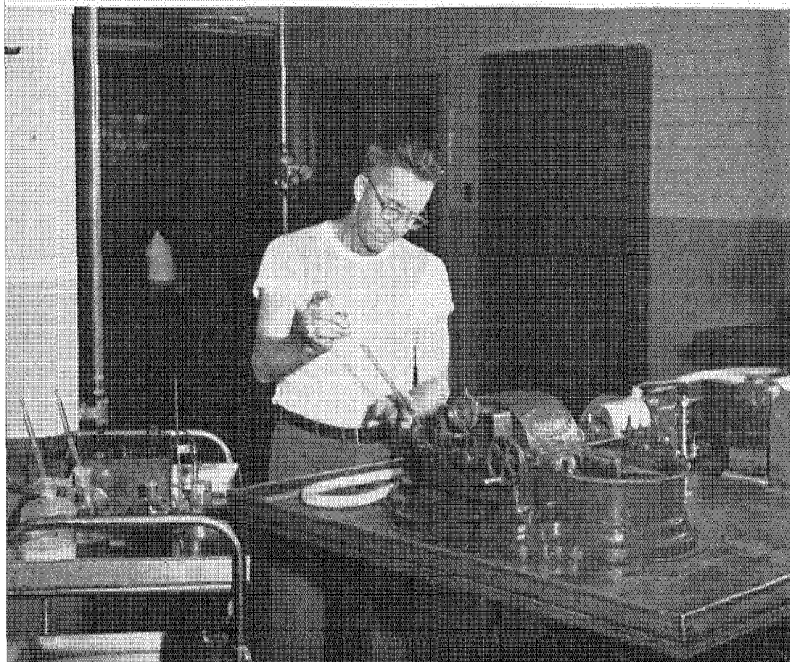
Room and facilities for paper research and development of specialty papers had been on a catch-as-catch-can basis prior to this year. Last July 23, Du Pont dedicated a \$250,000 laboratory at Deepwater, which will be devoted to latex research alone.

In part of the new, two-story building, beaters, driers, and other pieces of papermaking equipment can be hooked up to simulate different paper mill operations. It is, in effect, a papermaking plant on a pilot scale.

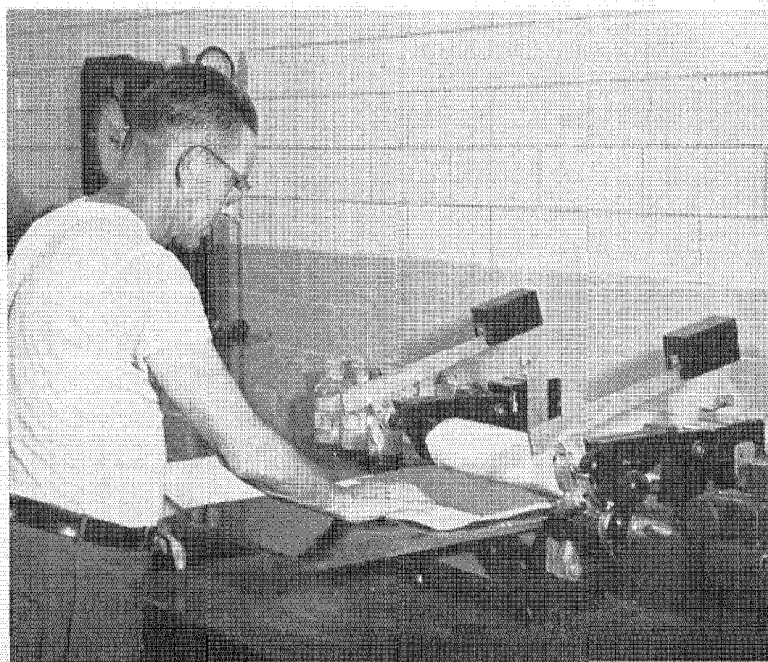
During the ceremonies that afternoon, a speaker referred to the "long procession of intriguing new products" which might, in time, emerge from the new laboratories. Part of this prophecy is already true.

9

In Du Pont's new \$250,000 laboratory, chemists study ways to combine rubber with paper to make useful new products.



Miniature paper beaters (left) and other pieces of equipment permit the lab to simulate different paper mill operations.



Beating blue mold

Du Pont "Fermate" and "Parzate" are protecting young tobacco plants against this leaf destroyer before it has a chance to strike



Whether you smoke or not, you're probably familiar with the big leaves of tobacco that look something like green elephant ears when they're ready for harvest. Looking at the full-grown leaf, it's hard to realize that it was about the size of a dime when it began one of its most critical phases.

Tobacco seed is sown thickly in a plant bed—as early as December or January in Florida and Georgia. When the weather begins to get warm and the seedlings are about four inches high, they are transplanted to the field, where they have space to grow.

It's important for the grower to get his plants in the field as early as possible, so that he can harvest his crop in time for the early marketing season when prices are usually best.

That means the seedlings in the plant bed have to get off to a good start, but keeping them healthy isn't exactly easy. One of the most serious menaces to tobacco seedlings is a fungus disease called blue mold. Growers know it as a bluish downy mold on the under side of diseased leaves. A severely infested bed has a foul smell, and finally looks as if it had been burned over. In some tobacco areas, particularly the Connecticut River Valley, blue mold is not only a constant plant-bed threat but in some seasons even attacks plants growing in the field.

A severe infestation may wipe out a grower's entire supply of plants. He can't walk into a garden store the way you might for tomato plants and buy sturdy plants that will give him a good crop. More than likely he'll have to take the leavings from another grower's plant bed. Purchasing plants is risky because there's always the danger of bringing new diseases into the soil of his tobacco fields.

When blue mold first appeared in southern tobacco areas in 1931, there seemed to be no way to control it. So growers began to seed up to twice the normal amount of plant bed area in hopes that enough

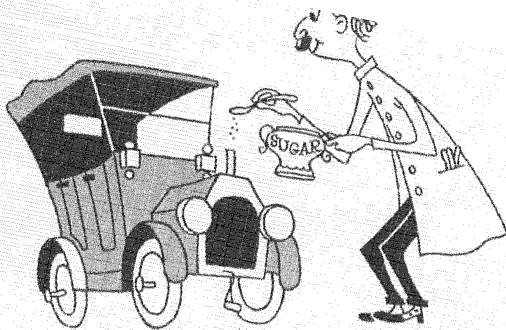
plants would survive to take care of their needs. A hundred square yards of bed might be seeded for each acre of tobacco field, whereas before blue mold appeared, 50 yards for each acre was enough. In 1949 this increased plant bed yardage cost North Carolina tobacco growers alone about \$4,000,000.

Such expensive measures are no longer necessary. Today chemicals will keep blue mold out of tobacco plant beds entirely. Many growers have come to rely on Du Pont "Fermate" ferbam fungicide, based on ferric dimethyldithiocarbamate, for protecting their tobacco plants without injuring the valuable leaves. Used in spray or dust mixtures before blue mold strikes, it will protect the plants. In the past two or three seasons, Du Pont "Parzate" zineb fungicide, based on zinc ethylene bis dithiocarbamate, has also given excellent control of blue mold, and some growers prefer it.

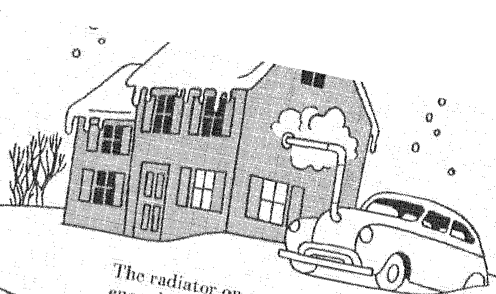
Agricultural authorities in the leading tobacco states recommend ferbam and zineb almost universally for control of tobacco blue mold. In some official recommendations, "Fermate" or "Parzate" is specified by name.

What does control of blue mold mean in dollars and cents? Howard R. Garriss, plant pathologist at North Carolina State College, makes this report based on figures compiled by F. A. Todd of the U. S. Department of Agriculture:

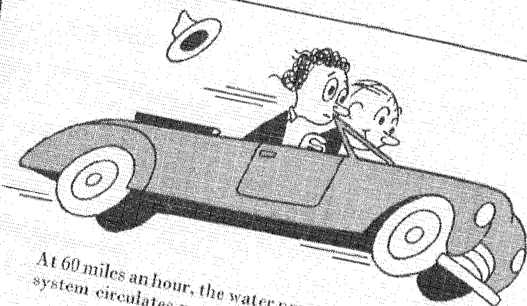
Without blue mold control measures, the cost of producing plants for setting an acre of tobacco is about \$26.30. Even then blue mold may wipe out the bed so the grower has to buy his plants, at a cost of another \$24 to \$30. A farmer using control measures can reduce the size of his plant bed, and cut the cost to about \$14.30. In other words, investing \$3 in blue mold control may save over \$40 for each acre of tobacco field. It's not a bad investment that yields over 1,000 per cent return.



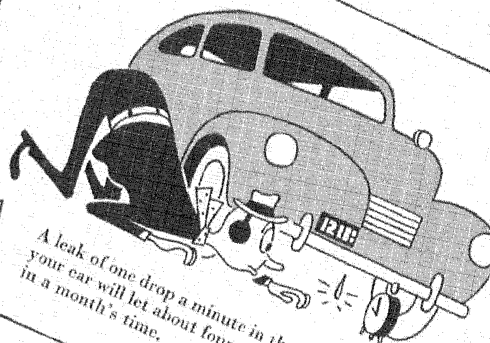
In the early days of the auto, such materials as sugar, honey, kerosene and calcium chloride were used to keep cooling systems from freezing. However, they were unsatisfactory and usually harmful. Out of Du Pont chemical research have come "Zerone" antifreeze and "Zerex" antifreeze for safe, sure protection against freezing, rust and corrosion.



The radiator on a modern automobile throws enough heat to keep a six-room house warm when the temperature outside is zero.

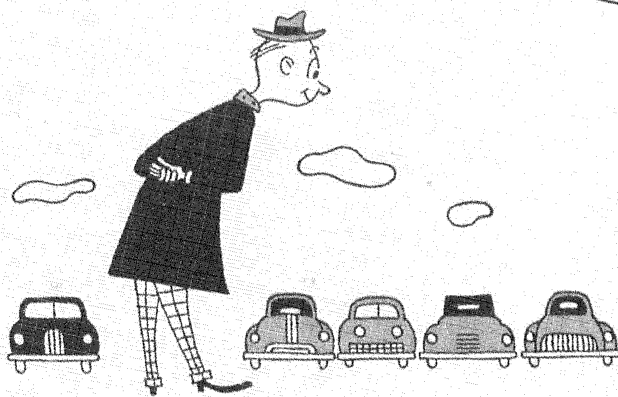


At 60 miles an hour, the water pump in the automotive cooling system circulates more than 3,000 gallons of water an hour.



A leak of one drop a minute in the cooling system of your car will let about four quarts of coolant escape in a month's time.

What do you know about antifreeze?



Performance tests have proved that "Zerone", Du Pont's standard-priced antifreeze, when used properly will provide efficient protection against freezing, rust and corrosion for four out of five cars on the road today.

harry goff



At times water itself is an antifreeze. Add five per cent water to pure ethylene glycol (the base of many "permanent" antifreezes), and the freezing point will drop from $+9^{\circ}\text{F.}$ to -6° .

Chapter 2: A customer's story

How a small
GREW into
Gasoline Business
FOUR Big
Service Stations




The DU PONT No. 7 LINE
Made by the makers of DUCCO

April 1929

MoToR

[Small text columns describing the business growth and Du Pont products are present but difficult to read.]

After 22 years, Du Pont reports on an early customer for the No. "7" line of automotive products. He's still doing business at the old stand—plus some new ones.

Back in 1929—when Herbert Hoover had just moved into the White House, stock prices were riding for a fall and the new Model A Ford was the talk of the automobile world—the first chapter in the story of Manning Evans was written.

A Du Pont advertisement told how in eight years Manning had parlayed a world of ambition and a few hundred dollars into a thriving service station business

in his hometown of Columbia, South Carolina. Starting out with one gasoline station in late 1920, he was operating four by 1929, the ad said.

It told how Manning had added to his profits by stocking the popular line of Du Pont No. "7" products, beginning with No. "7" "Ducco" polish in 1926. It concluded with the observation that Manning, a successful businessman at the age of 30, believed he had done nothing remarkable—that any hardworking young fellow could have done the same.

Thus ended the first chapter. Then, a few weeks ago, a *Du Pont Magazine* reporter was sent to Columbia with this assignment: renew the old acquaintance with Manning Evans; find out how the years have dealt with this enterprising Du Pont customer.

Today the Evans Motor Company—which is another way of saying Manning Evans—is prospering. It operates two gasoline stations, leases two more to outside operators and is currently building a fifth. A fuel oil department, started in the late '30s, sells a million gallons yearly. A tire recapping shop, opened last March, is doing \$6,000 worth of business a month.

Manning calculates the present worth of the Evans Motor Company at about \$250,000. At least, that would be his asking price were he asking. Not bad, when you remember that he started business with a stock of 200 gallons of gasoline and 50 gallons of oil, half paid for and half on consignment.



Son Jimmy claims a major share of Manning Evans' attention when the work day ends. Here they discuss model railroading.

He still carries the fast-moving line of Du Pont No. "7" products at his stations, and estimates that he's sold about \$13,000 worth of No. "7" "Duco" polish alone over the years. His particular favorite is Du Pont Cooling System Cleanser.

"I feel I'm doin' the customer a good deed by sellin' it to him," he drawls. "I just tell him he's goin' to have trouble if he don't clean out his radiator."

As Manning Evans' business has expanded, so has Du Pont's automotive line. There were four No. "7" products in 1929—"Duco" polish, auto top finish, nickel polish and touch-up black. Today there are 30, and Manning's shelves carry most of them.

The principal Evans service station is near the geographical center of Columbia, a little over a mile from the state capitol. Manning's office is tucked away on the second floor.

NO LOCK ON THE DOOR

The boss occasionally tends the gasoline pumps himself, but it's a far cry from the old days when he started his own business. During those early years he opened the station at 6 a.m., had his meals brought to him, and often closed for the night after the last street car had gone. When help was scarce during the last war he sometimes worked a 36-hour trick.

"We don't have any lock on the door of this station," Manning boasts. "We're open around the clock around the year. I closed up one Christmas, and I had so many calls I decided never again. I stayed open durin' the war because the public has been pretty darn good to me, and I felt I owed them something."

One thing that strikes you immediately about Manning Evans is his outspoken pride in the South in general and Columbia in particular. For years he sponsored an annual barbecue for the University of South Carolina football team. He never misses one of their home games. He's a member of the Chamber of Commerce, the Junior Chamber, the Lions Club, and steward of the Shannon Methodist Church.

At the bottom of Evans Motor Company stationery appears the sentence: "This paper is made of cotton, the principal crop of the South."

"It was my own idea," Manning says. "I just wanted to remind the local people that our main crop is used for something besides clothing."

Manning Evans, his wife Betty and their nine-year-old son Jimmy live in a comfortable nine-room brick house in one of Columbia's better districts. Jimmy, born long after the Evans had despaired of having children, is obviously the delight of his father. "I'd like to be able to spend more time with the boy," says his father, eyeing the active youngster indulgently.

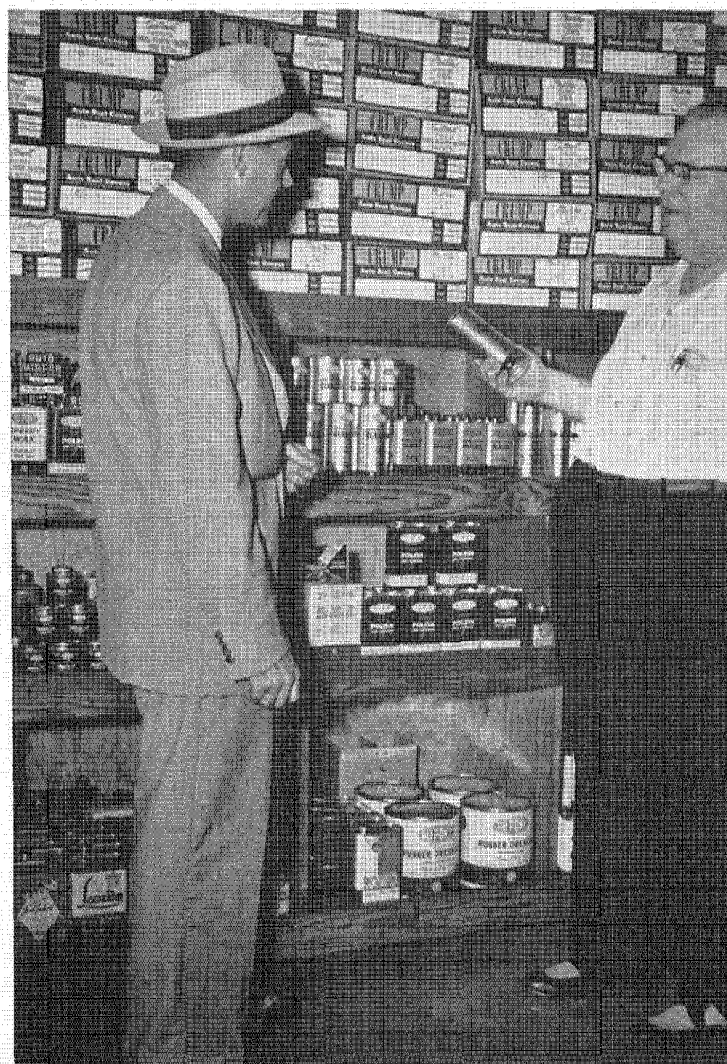
So that's chapter two on Manning Evans, 22 years later. He's done all right for himself, and in the process his customers and his community have benefited, too. The reporter prepared to take his leave.

"Glad you stopped in," said Manning. "Now that you know where we live, don't stay away so long next time."



The Evans Motor Company, started on a shoestring, continues to grow. A tire recapping shop was opened a few months ago.

The boss discusses product performance and selling slants with W. H. McBride of Du Pont, sales representative for No. "7" line.



Black hills bonanza

Dakotans may call them the Black Hills, but the Homestake Mining Company has made them famous for that precious yellow stuff

By J. J. TORPEY

In the museum at Deadwood, South Dakota there's a piece of sandstone, found in 1887 by one Louis Thoen. Scratched in it, apparently with a knife, is the following:

"Came to these hills in 1833 seven of us DeLa-compt, Ezra Kind, G. W. Wood, T. Brown, R. Kent, Wm. King, Indian Crow, all died but me Ezra Kind killed by Ind behind high hill Got our Gold dust June 1834."

The reverse side reads:

"Got all the gold we could carry Our ponies all got by the Indians I have lost my gun and nothing to eat The Indians hunting me."

Although the origin of the tablet is open to some question, its message about the gold is 24-carat fact. The Sioux Indians were known to have gold even before the recorded dates of the area's discovery by white men. In 1874 an expedition under General George A. Custer was sent into the Black Hills to get information about the lay of the land. But even before the expedi-

tion's official reports were published, rumors that gold had been found gave impetus to a rush that reached stampede fever by 1876.

In the Gold Rush of '76 placer claims were located on practically every creek in the northern Black Hills. Several were very rich, especially the Wheeler Claim from which about \$100,000 was panned during the year.

But placer mining—that is, washing the gold from the gravel of the creek beds—was shortlived. Within a few years, the bewhiskered prospector with pick, shovel and pan had left the scene, and the stage was set for more modern methods.

As early as the summer of '75 a few venturesome souls were investigating quartz lode claims. Among them, Moses and Fred Manuel were the most fortunate. After reading newspaper accounts of Custer's expedition, the two brothers met in Helena, Montana and headed for the hills. After a winter of prospecting, they discovered the Homestake Lead (pronounced "leed"). A ledge or outcrop of ore was called a "lead"—and that's the story of how the present mining

Today Homestake Mining Company wrenches 1,400,000 tons of gold ore a year from South Dakota's hills.



town or Lead gets its name.

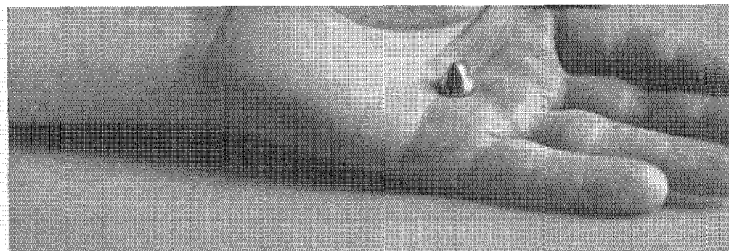
A year later a representative of a San Francisco syndicate came to the Black Hills and optioned the Homestake and Gold Star claims for \$70,000. These claims, covering about ten acres, are a very small part of the 6,000 acres now owned by the Homestake Mining Company.

The early Homestake property went into production in 1878, after overcoming more than its share of difficulties. At the time, for example, the nearest railroad point was at Sidney, Nebraska. All of the equipment—including 80 ore-crushing stamps weighing 750 pounds apiece—had to be hauled 270 miles by ox team. By July, however, the stamp mill was finished and ready to go.

With the turn of the century came many technological improvements to Homestake. For instance, the recovery of gold by amalgamation was replaced by cyanide treatment, and many other innovations that advanced the science of metallurgy were adopted.

Today miners wrench 1,400,000 tons of ore a year from its golden hills. Two shafts are in operation—the Ross with a depth of 4,100 feet, and the Yates with a depth of 4,250 feet. Mining is conducted on 27 different levels, with some 200 miles of tunnel openings.

The ore is unusually hard and tough. A man with a pick could hardly make a dent in it. The rock's even harder than Mount Rushmore granite where the faces



There may be gold in the proverbial hills, but it's spread thin. This button is the amount obtained from a ton of ore.

of Washington, Jefferson, Lincoln and Theodore Roosevelt are carved.

To break up such ore and prepare it for handling requires many special types of tools and equipment. Du Pont explosives and blasting supplies are members of this team. Every year Homestake sets off more than 1,000,000 blasts that explode 3,100,000 sticks of "Gelex" No. 2 dynamite. End-to-end, these sticks would reach from Lead, South Dakota to Denver, Colorado. With these mountain-moving quantities of explosives, 39,000 feet of 7 x 7-foot tunnel are driven yearly through waste rock to reach the ore.

Blasting its way to gold, the Homestake Mining Company has played a big part in developing the Black Hills country. And for over 70 years, it has helped to build a prosperous South Dakota.

Electroplating with "Lucite"

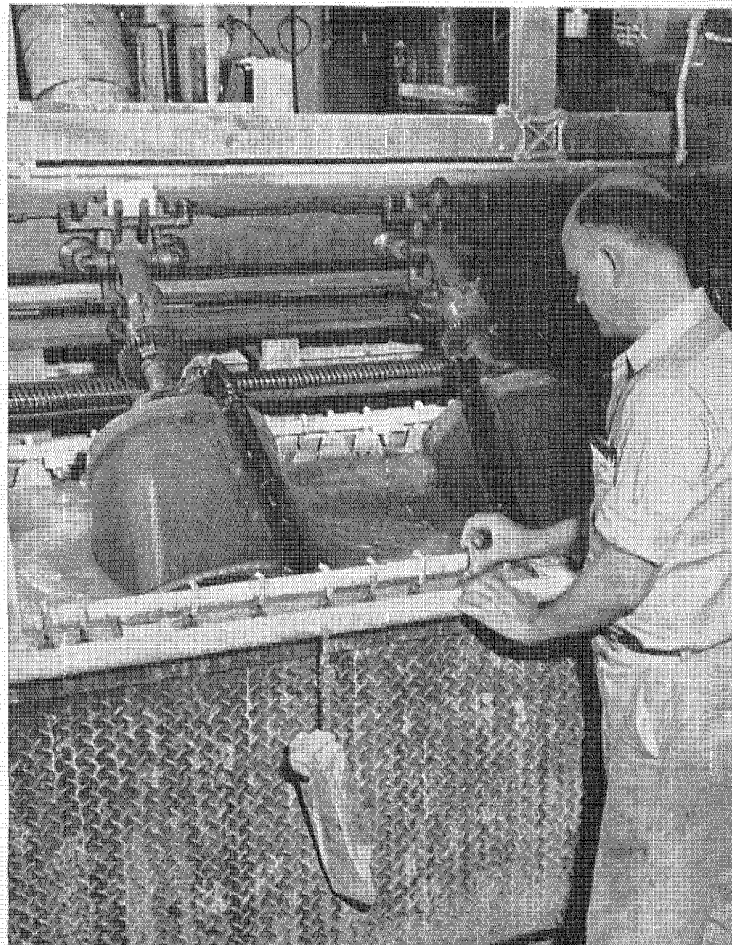
Since its commercial bow in 1938 Du Pont "Lucite" acrylic resin has been used successfully in airplane canopies, advertising signs and automobile ornaments, to name only a few products.

Not long ago the transparent plastic established itself in still another field. Barrels, tanks, liners and other equipment made of "Lucite" are now being used in electroplating zinc, chrome, nickel, and the like on items ranging from snap fasteners to electronic parts.

"Lucite" withstands the high temperatures encountered in many plating operations. It resists the corrosive action of many electroplating solutions, is light in weight, shatter-resistant and nonconductive.

Manufacturers of the equipment—Udylite Corporation of Detroit, Singleton Company of Cleveland, Belke Manufacturing Company of Chicago—find "Lucite" easy to work with. It can be punched, stamped, drilled and sawed. Cemented or heat-welded joints are as strong as the plastic itself—an important point in case of accidental damage on the job.

The spokesman for a firm which has used plating barrels of "Lucite" for 20 months says: "These barrels have been a definite saving to us. Because they are easily repaired, our maintenance expense on this type of equipment has been reduced more than 90 per cent."



They put dreams to work

*Chemical engineers help new products up the steep
path from the laboratory to the marketplace*

As this article is written, American industry is faced with a critical shortage of engineers, chemical engineers among them. Du Pont alone employs about 2,300 chemical engineers—56 per cent more than a decade ago—and has openings for about 300 more. Industry as a whole needs about 5,000 of these trained men and women a year. The defense program has intensified this demand, and, at the same time, claimed a large number of engineering graduates for the armed services.

By E. R. MANCHESTER and GORDON KESTER

According to legend a European science professor once thanked God that no discovery of his had been "prostituted to practical use." Happily for all of us, his stiff-necked attitude is long since out of date.

It probably would shock the professor to know that today thousands of chemical engineers make a career of putting to practical use the discoveries of their brother research chemists in the laboratory.

They guide a new product from the test tube through the semi-works and pilot plant stages to full-scale production—from laboratory infancy to commercial manhood. The factory equipment they design and teach others to operate makes the research chemist's dream come true—and pay off.

The latter is important. An engineer should possess a share of the banker's hard-headedness in financial matters, combined with the creative imagination that can translate what happens on a laboratory bench into a factory process. His process must be able to compete economically with others in industry.

Industrial chemistry is generally dated from the patenting of the soda ash process in 1792 by the French chemist Nicolas LeBlanc, who extracted sodium carbonate from a heated mixture of sodium sulfate, charcoal and chalk. But nearly 100 years passed before

chemical engineering came to be recognized as a distinct profession.

E. I. du Pont de Nemours, who founded the Du Pont Company in 1802, was performing the job of a chemical engineer when he built his black powder plant beside Brandywine Creek in Delaware. The buildings had three stout stone walls, one frame wall and a light roof, so that the force of an accidental explosion would be dissipated in two directions—away from neighboring structures. It was a safety consideration, and safety is still one of the chemical engineer's primary concerns.

In November, 1887, the faculty of Massachusetts Institute of Technology appointed a committee to "consider instruction in engineering as related especially to applied chemistry." A course schedule was adopted the following year, and the first class of chemical engineers was graduated in 1891.

The spectacular growth of the American chemical industry after World War I intensified the demand for chemical engineers. Today there are literally thousands of large and small chemical companies in the United States, and membership in the American Institute of Chemical Engineers has increased six times over since 1936.

The 1951 president of the Institute is Dr. Thomas H. Chilton, a soft-spoken Alabamian whose career

covers almost half of the period during which chemical engineering has been an accepted profession. He directs the Development Engineering Division of the Du Pont Engineering Department and holds Columbia University's Chandler Medal for the formulation of principles underlying certain of the unit operations of chemical engineering.

Some of these unit operations are the flow of fluids and heat, distillation, extraction, gas absorption and other physical operations involving, in many instances, chemical reactions. Development engineering is concerned with basic research into the factors that determine how materials behave. With this knowledge new apparatus can be designed and existing processes improved. It is a never-ending process.

The chemical engineer's task begins "as soon as you leave glassware and are ready to build something out of iron and steel," in the words of Dr. Chilton.

With the rise of chemical engineering there has been a marked change in the methods of developing a chemical process and of designing a plant for it. In the early days, a chemist frequently guided a product from laboratory to plant, more or less "playing by ear" as he went. Today chemical engineers are an integral part of the research staff that has replaced this one-man team.

Before a project is approved for extended research and development work, the chemical engineer is frequently called upon to analyze the proposed goals of the study to see if they are sound commercially. He works with research chemists to set up "reasonable" goals of yields. With the help of others, he estimates raw material and plant requirements, investment, operating cost and the like. Thus, he is able to make sound criticisms and recommendations for continuing or dropping the research project.

In preparing to translate a laboratory process to the industrial scale, the chemical engineer must set up and conduct critical experiments that will define the outlines of a safe and economical operating process and indicate the equipment needed for manufacture. Because of his training in chemistry, engineering and economics he is most often the logical man to coordinate the work of the many others who play an important part in process development.

A recent example of modern industrial teamwork is the evolution of "Orlon" acrylic fiber from the "glassware stage" to plant production. Basic research on the fiber-forming polymer was conducted before World War II, and commercial development was begun in 1947.

A chemical engineer directed the task force of chemists and 50 to 60 engineering specialists of one kind or another assigned to the development of the process and the specification of plant-scale equipment.

First came the construction of a semi-works to pro-

vide engineering data and samples of the new fiber for testing by textile manufacturers.

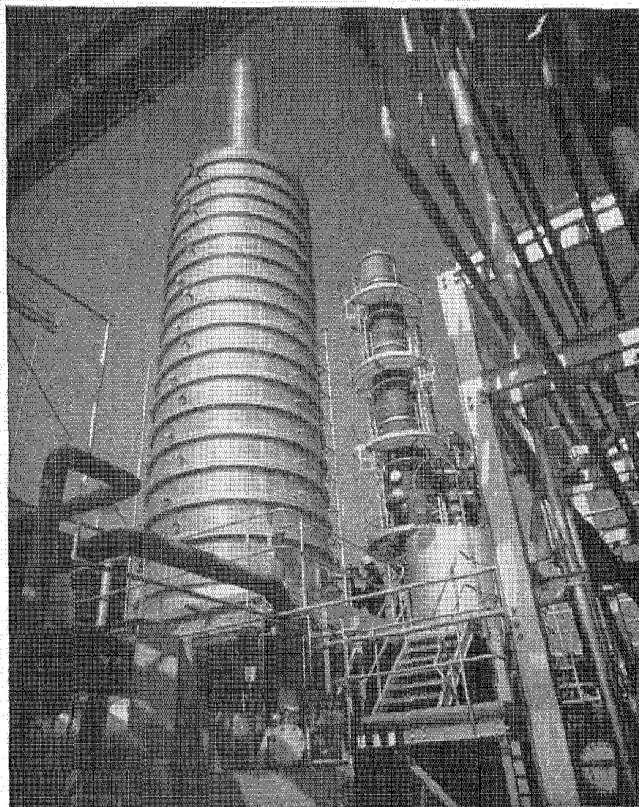
"In getting a new product under way, we always keep this question in mind: Is it worth commercializing? 'Orlon' continued to look good, so we kept on," said one chemical engineer.

After the semi-works came the pilot plant, where a single, plant-size unit for production of the fiber was built. There operators were trained by chemical engineers to use the equipment safely and efficiently. At the same time designs were being drawn and construction was beginning on a full-scale plant at Camden, South Carolina. The final step was a large one. Production capacity at Camden is 30 times that at the pilot plant in Waynesboro, Virginia. In all, Du Pont invested some \$25,000,000 in the new fiber.

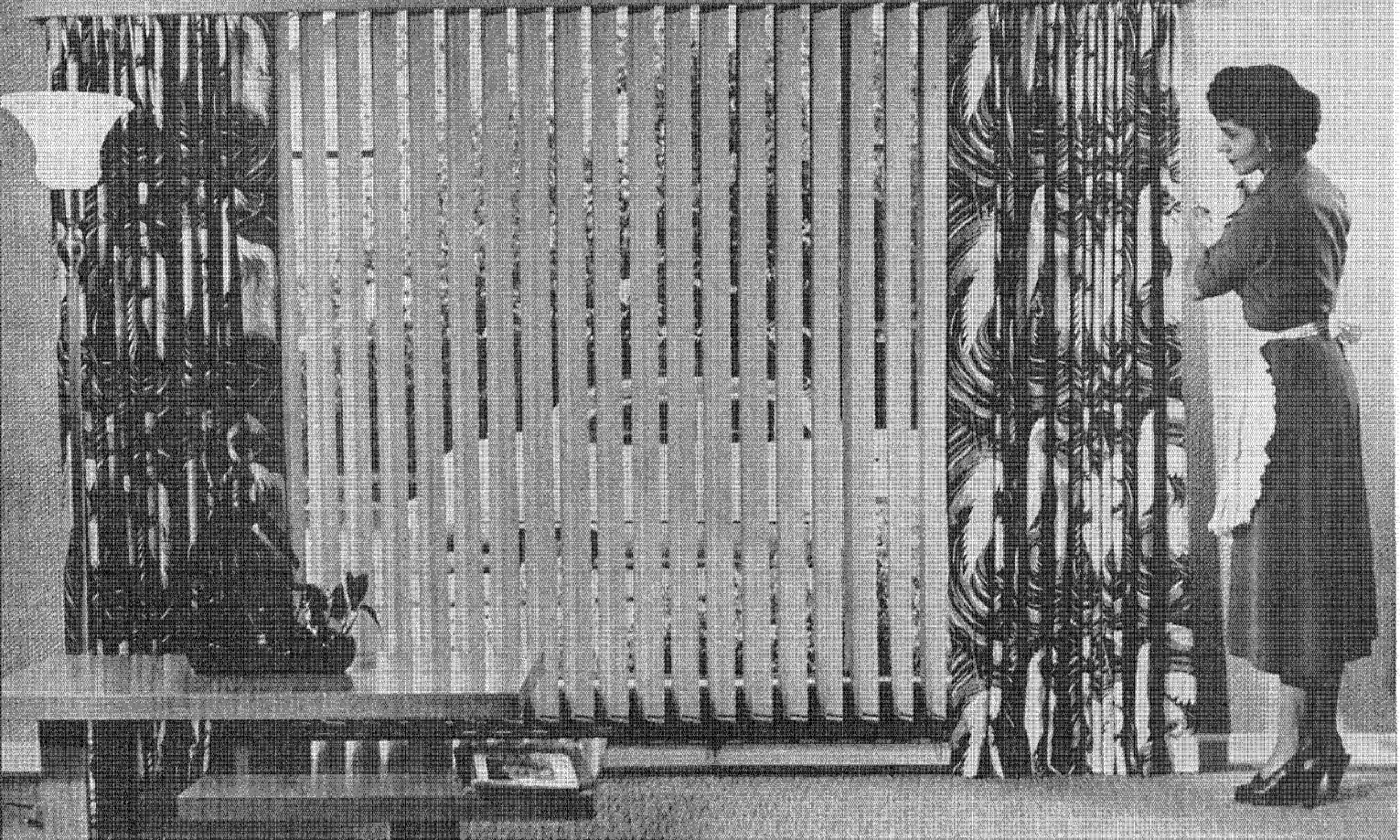
How do chemical engineers feel about putting someone else's dreams to work—"prostituting to practical use" the results of laboratory research?

Dr. Chilton had this to say in a talk before student engineers at Virginia Polytechnic Institute last year:

"Engineering work yields well in the sense of important accomplishment. Whether in a large organization or a small one, it is work of this type that has made possible the material advances in our civilization that provide better living and a fuller life for all."



A chemical engineer led task force which developed "Orlon" from "glassware" stage to full-scale production at Camden.



Verti-Blinds add drama to picture windows, are also recommended for office use. They come in several colors.

Look at...look through

With the new trends in architecture, today's windows are bigger and brighter than ever, but the problem remains: they must be able to supply privacy and good looks as well.

To the seemingly eternal perplexities of shades and blinds, curtains and drapes, the new Verti-Blind, product of the Vertical Blind Manufacturing Corporation of Geneva, Illinois offers a new solution.

Verti-Blinds are fashioned of 4¼-inch-wide overlapping "vanes" or louvers hung lengthwise from a horizontal roller installed at the window top. By a single pull cord, they can be opened or shut, rolled up or down to any desired extent. The closed blinds give an impression of pinch-pleated draperies. Their long simple lines—with or without side drapes—are excellently suited for either modern or period interiors, for offices and display windows, or for unusual room partitions.

Opened full, the vanes admit floor-to-ceiling light without appreciable obstruction of view; partially opened, they direct light to either side of the room. For

a drape effect, they can be parted in the middle and drawn to the side through tie-back loops.

Equally important advantages are found in durability, ease of upkeep, and a wide selection of decorator colors.

Verti-Blinds' vanes are made of Du Pont "Tontine" washable window shade cloth, the plastic impregnated cloth which eliminates mildew hazards, and resists fading, cracking and flaking.

Perhaps best of all, the blinds need a minimum of cleaning, since the smooth surface of "Tontine" sheds dust, and needs only an occasional soap and water rub to come forth renewed.

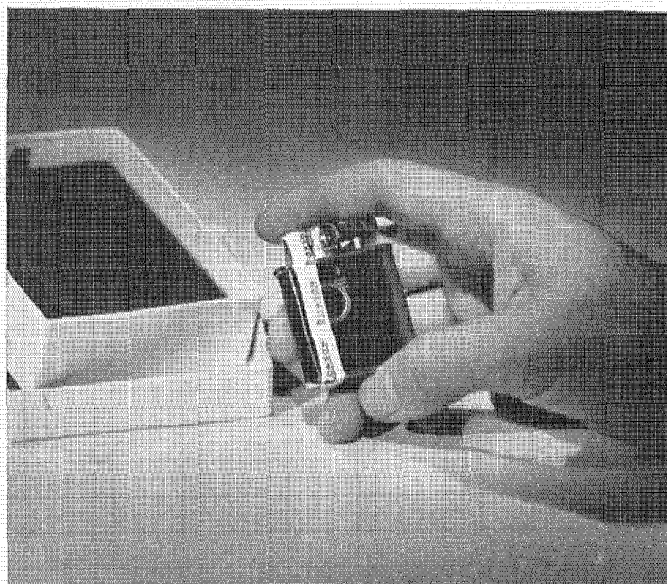
Eleven colors are now available, with more likely to come. They range from chartreuse and forest green to turquoise and white. Colors can be combined for striking effects.

Verti-Blinds are assembled according to the customer's specifications, and about 5,000 homes and an equal number of commercial establishments have installed them during the past year.

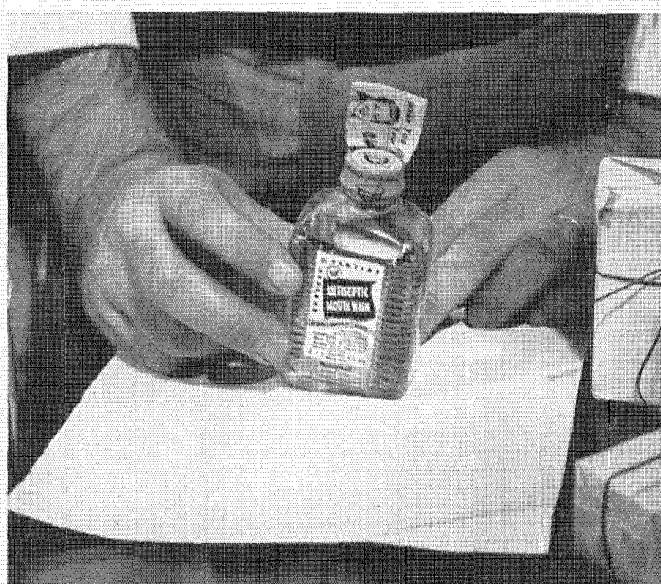
New notes on packaging

When businessmen discuss modern packaging techniques, chances are conversations will soon get around to Du Pont "Cel-O-Seal" cellulose bands. Versatility is their keynote. We've written how this product holds two or more containers in a compact display unit, related accounts of food and drug firms which put these bands on their products to protect them from tampering and adulteration—and even written about one manufacturer who kept the cork handles of fishing rods from becoming soiled when handled in stores by using a protective skin of "Cel-O-Seal". Here are four more new notes on packaging.

In a new Ronson lighter, sparks from the flint light a jet of escaping gas. To be sure fuel isn't wasted, the snuffer cap is held in place, until purchase, by a "Cel-O-Seal" band.



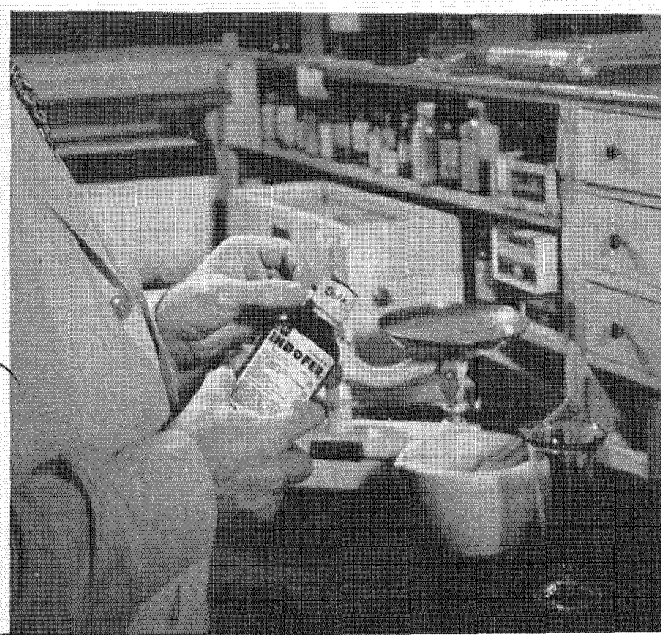
Descriptive material is made part of this mouth wash package. The Du Pont cellulose band, when it's slipped over folder and neck of bottle, shrinks and holds literature securely to cap.



This Denver company once had 2 different labels on its jars. The secondary one, saying "Kosher Pickles," has been replaced by a printed "Cel-O-Seal" band because it made container virtually tamperproof, was easy to apply, and cost less.

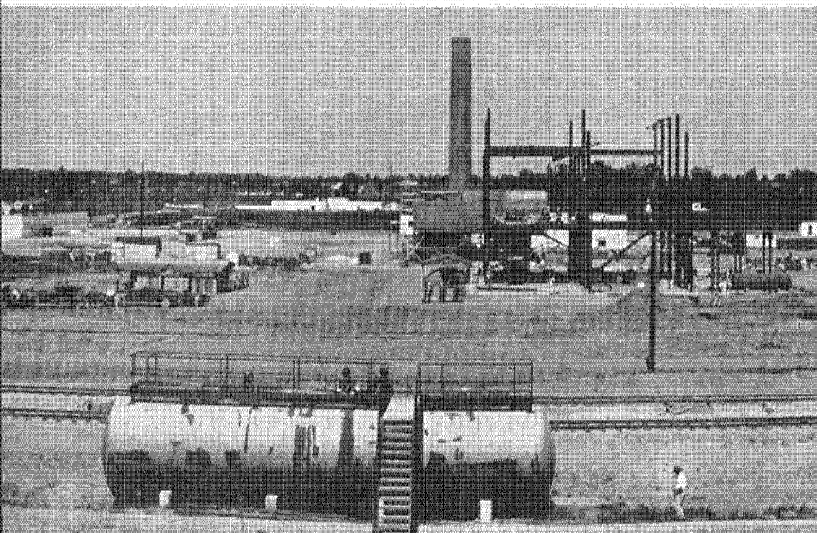


Pharmaceutical companies know the importance of safeguarding the cleanliness of their products. Many use cellulose bands to keep dirt from collecting around the mouth and cap of medicine bottles, and to keep the closures from loosening.

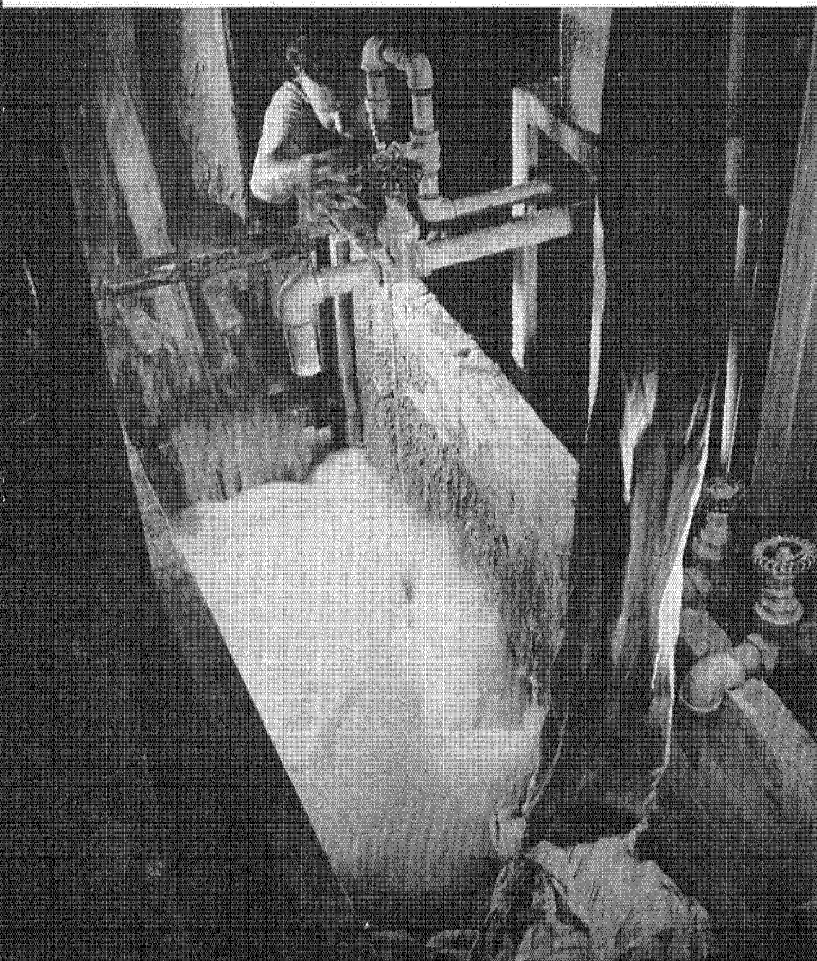


More peroxide from Memphis

Like some chemicals such as sulfur, peroxides have been in short supply for some time now. The pinch of a demand that far outstrips supply has been felt in the textile business, where these chemicals bleach cotton, rayon and other fibers. Rubber manufacturers have been affected. And the pulp and paper industry



Now going up at Memphis, a new plant for hydrogen peroxide will make that chemical more available. Completion is slated for late in 1952.



has been hit especially hard. Until the shortage arose, peroxides had been expanding rapidly in this industry as bleaching agents for groundwood pulp. We reported on this bleaching process in our August-September 1950 issue, telling how it results in paper that's economical, opaque, clean, and takes printing inks well. The process, we noted, had saved about \$2,500,000 worth of wood in one year.

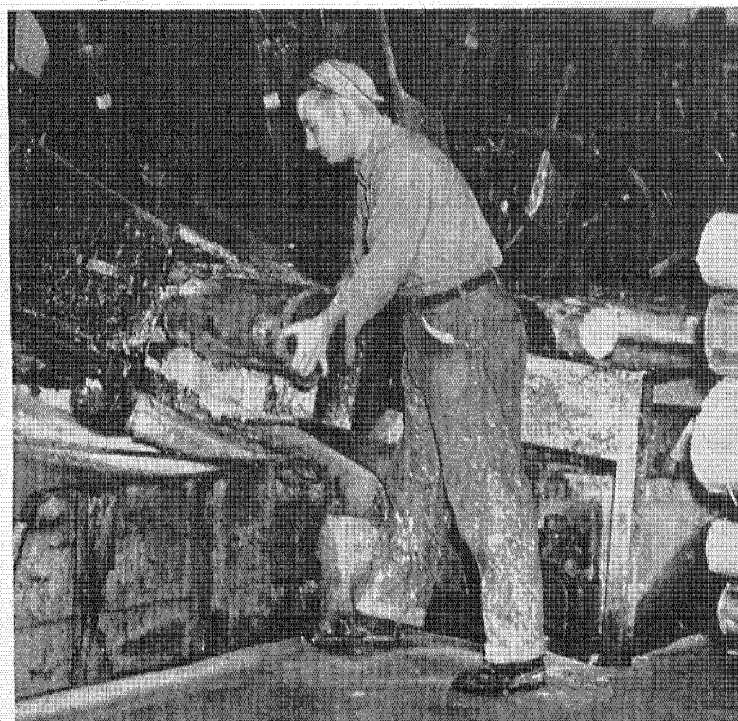
But soon the growth of the process was halted by the peroxide shortage. Many mills that would have benefited from groundwood bleaching had to postpone the idea for a while.

Today, the chemical industry is once again seeing the glow of an adequate supply on the horizon. Du Pont, for instance, announced this year that a new plant at Memphis for "Albone" hydrogen peroxide will start operation in late '52. Here, "Albone" will be made by an improved process that represents six years of research in Company laboratories. It will be the first hydrogen peroxide plant convenient to Southern industries.

At the moment, paper companies are starting to take their delayed plans for groundwood bleaching units off the shelf. Several of these peroxide units are already in the planning or construction stages. Although thinking about late '52 seems premature now, it takes time to get appropriations approved, plant layouts made, and machinery ordered, installed and tuned up.

As "Albone" starts to flow from the new Memphis plant, all of the industries that need it will be able to breathe a little easier.

Textile and groundwood pulp producers have been affected by the peroxide pinch. Now, with more "Albone" in sight, several pulp mills have announced plans for new bleaching units.



Nothing fishy about it

*That's only one quality of synthetic vitamin A,
the new biochemical that frees us of
dependence on fisherman's luck*

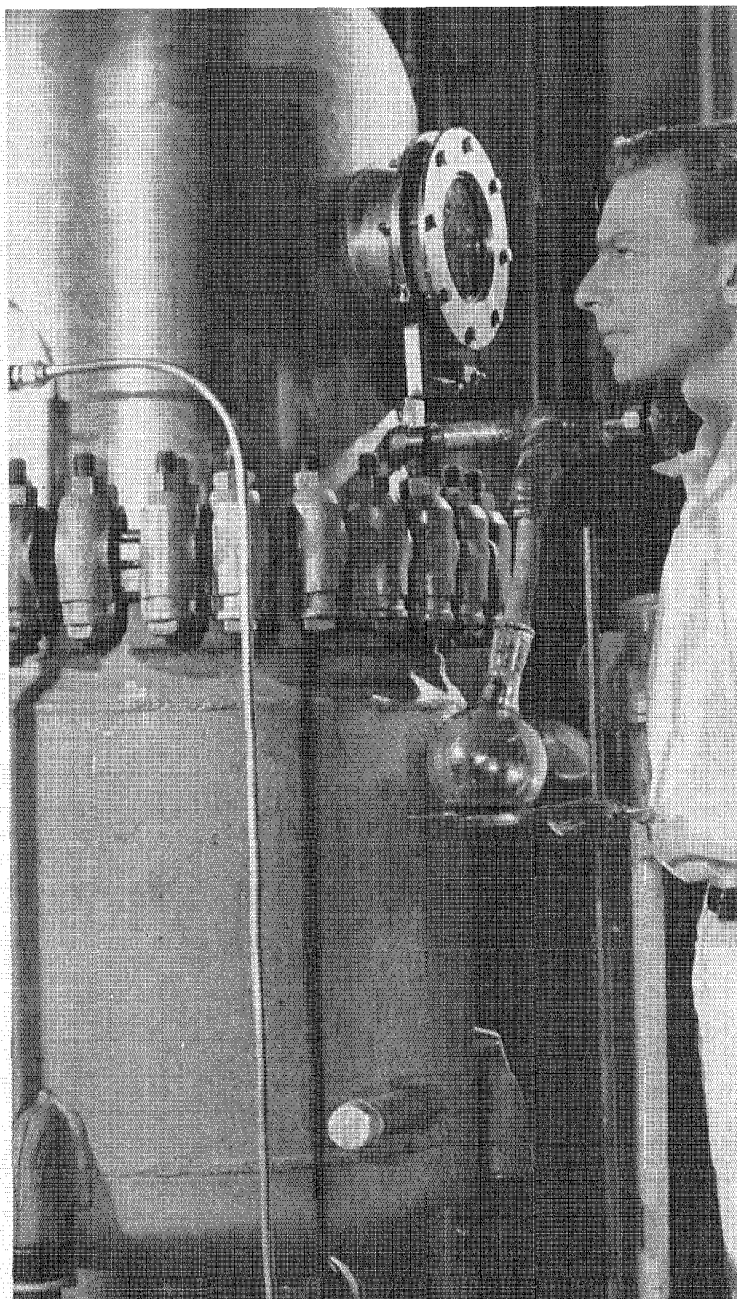
A major advance in organic chemistry came last year with the announcement by Hoffmann-LaRoche, Inc., that vitamin A had been synthesized and was being produced commercially at the firm's new pharmaceutical plant in Nutley, New Jersey.

Until then most vitamin A had come from the livers of cod, halibut and sharks. This fishy origin was evident in the taste and smell of the final product—to the dismay of millions of kids forced to swallow it by the spoonful.

The man-made vitamin has none of the pungent odor and disagreeable after-taste of the fish oil derivative. More important, the synthetic process can be controlled to assure a uniform vitamin content. This avoids the fluctuation in potency and quality characteristic of fish liver oils.

Du Pont "National" anhydrous ammonia plays an important part in the synthetic process. One manufacturing step involves the use of ammonia as a solvent for alkali metals. For this purpose, the ammonia must be pure and free of moisture. "National" anhydrous ammonia meets the rigid requirements of this and other pharmaceutical applications, because it contains 99.99 per cent ammonia, with less than 50 parts per million, by weight, of water. Thus it dissolves alkali metal without the hazard of fire or the danger of contaminating the process.

The importance of the development can be gauged by the fact that the Hoffmann-LaRoche plant alone could meet the nation's requirements for concentrated vitamin A, although a number of manufacturers now use the synthetic process. This ready availability of



New synthetic vitamin A is manufactured under carefully controlled conditions. The purity of Du Pont "National" anhydrous ammonia meets these high standards.

the synthetic vitamin frees pharmaceutical manufacturers of dependence on remote sources of supply and seasonal price variations of the natural product.

The synthetic vitamin is identical with the natural one in its biological, physiological, chemical and physical properties, although lacking its fishy odor. Since it is dependably pure, nutritional and clinical workers can now evaluate its effects more clearly.

Vitamin A is essential to life, health and growth. The major markets for it, other than pharmaceuticals, are foodstuffs and feeds, many of which are fortified with this and other vitamins.



A Wisconsin papermaker is saving \$15,000 a year by using sulfamic acid as a cleansing agent.

The things they do with sulfamic acid

*... vary from manufacture of
sweetening agents and weed killers to new
and better ways of cleaning equipment*

By JAY H. MACKEY

"Here is a new chapter in the story of coal, air and water, and how the children, grandchildren and great-grandchildren of this union have found new ways to work for us." We wrote that first chapter on sulfamic acid ten years ago. Now we're bringing the report up to date.

Soon after Du Pont developed a commercial process for making white crystalline sulfamic acid from urea and sulfuric acid in the late '30s, experimental probing led to several important uses. Sulfamic acid teamed up chemically with other compounds to flame-proof and soften fabric and paper. It turned weed killer. Dyemakers found it helped produce brighter, clearer colors.

At present, the most promising new applications of the acid are in the widely separated fields of cleaning and manufacturing. In Chicago recently, we watched men clean the pasteurization equipment at a plant of the Bowman Dairy Company, one of the largest independent dairies in the country. Their director of

research, Dr. Herbert D. McAuliffe, explained that during a day's operation there is a gradual build-up of milk solids on the heating surfaces of the equipment. At the end of a long run, when as much as 200,000 pounds of milk have been passed quickly through the high-temperature pasteurizers, removing this deposit requires special cleaning methods.

The most common cleaning procedure is to pump a hot, dilute acid solution through the equipment to dissolve some of the solids and more effectively prepare the soil for final cleaning with alkaline detergents.

A number of acids can be used, but some are too corrosive to the stainless steel equipment, while others are so weak that the amounts required would cost too much. "Sulfamic acid," said Dr. McAuliffe, "is strong enough to do a quick and thorough job and is non-corrosive when properly used. Since it is a powder that doesn't absorb water from the air, we prepackage the amount required for our cleaning operations. For more than two years now, we've had a perfect cleaning job every time without any damage to the equipment and at a substantial saving, too, by eliminating waste and over-usage."

Results have been even more startling in neighboring Milwaukee where a paper manufacturer figured

out a way to save \$15,000 a year with this chemical. At Cornell Wood Products Company, paper begins life as a slurry of water and paper pulp. The soupy mixture is picked up by cylinder molds and passed on to endless belts, called papermaker felts, forming a continuous sheet of paper.

The last of these in the series, the press felt, leads a particularly tough life. It has to suck water from the paper and, as a result, sizing materials, fillers and fibers clog its pores so badly that the felt loses its water absorbency. It must be rejuvenated, or cut off and thrown away after less than a week's wear.

Cornell then figured out this money-saving recipe: when a press felt gets dirty, dissolve about 50 pounds of sulfamic acid in hot water and spray on the felt for 20 minutes. Rinse with plain water and start the paper rolling again.

At Cornell this treatment makes the felt about as soft, clean and absorbent as new; its life span is doubled or better. In addition, sulfamic acid is now being used on cylinder molds.

Sulfamic also carved a niche for itself in the pharmaceutical industry recently as a basic ingredient in a new non-caloric drug 30 times sweeter than sugar. This Abbott Laboratories product, "Sucaryl" cyclamate, came into being because a young chemist paused during an experiment at the University of Illinois to trace down a sudden sweet taste in the cigarette he was smoking. Abbott became interested in this sodium cyclohexylsulfamate, and taught themselves how to produce it for those who crave sweets but must eat sugar-restricted diets. "Sucaryl" stays sweet even at boiling and baking temperatures, so appetizing pies, cakes, puddings, ice cream, and even preserves can be cooked with the new product.

The Food and Drug Administration in Washington gave "Sucaryl" the green light, users smacked their



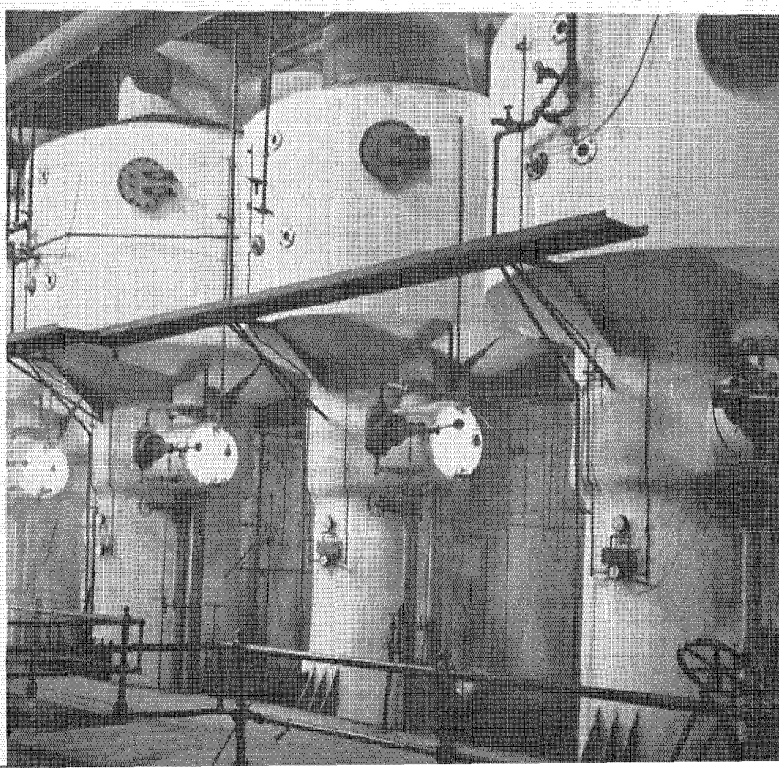
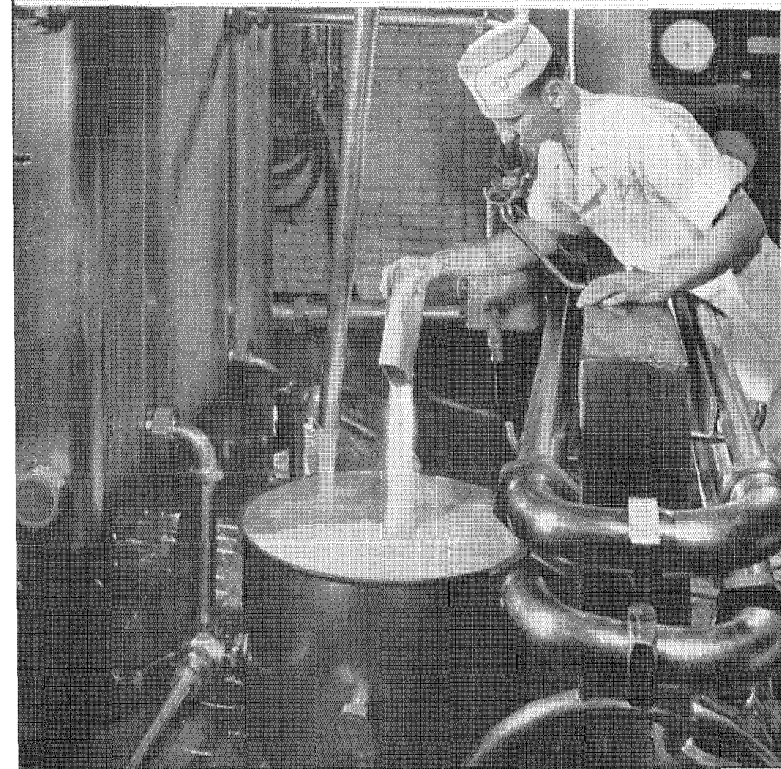
Sulfamic acid is a basic ingredient in new noncaloric sweetening agent that stays sweet even during cooking.

lips over its clean sweet taste, and the food industry visualized a new market of sweet-loving but calorie-conscious consumers. A fruit canner in Chicago, several national ice cream manufacturers, and a brand-name candymaker all successfully tested "Sucaryl". An Iowa bottler is selling soft drinks sweetened with it.

Sweets and sulfamic acid meet again in sugar mills. The experience of sugar producers in the United States, Cuba, Puerto Rico, and the Dominican Republic has shown that sulfamic acid will clean their evaporating equipment thoroughly. They also agree with Bowman Dairy that this is an economical and safe-to-handle acid.

The possibilities of this chemical fill a good-sized booklet. For example, the Grasselli Chemicals Department product information bulletin goes into detail to explain how improvements can be made in dyeing procedures, hydrocarbon catalysis, manufacture of plastics, and pickling and electroplating of metals. Reports have been written on the acid's use in surface active agents and for a score of other applications. Luckily, the supply is plentiful now, for there is no telling how many more of sulfamic acid's "promising uses" will become "practical uses" during its second decade.

In a Chicago plant, the proper amount of the Du Pont acid is measured out for cleaning stainless steel milk pasteurizing equipment. The acid is also used both here and abroad by sugar mills to clean evaporating equipment without corroding it.



Wood from waste

Perhaps in no other manufacturing process is the waste of raw materials so great as in the wood industry. In one recent year alone, wood waste from logging, lumbering and manufacturing of wood products amounted to 108,900,000 tons. This huge loss is everyone's concern, for it is a factor in the cost of houses, furniture, and all products made of wood.

More than 40 years ago, wood technologists sought ways of transforming wood waste into a useful material. Among other things, they tried to make a composite board of wood chips and shavings, but none of the adhesives then available made a satisfactory binder. Then about ten years ago, they turned to the new synthetic resins and found what they wanted.

Today, more than 17 plants are turning out structural boards made of a small amount of resin and

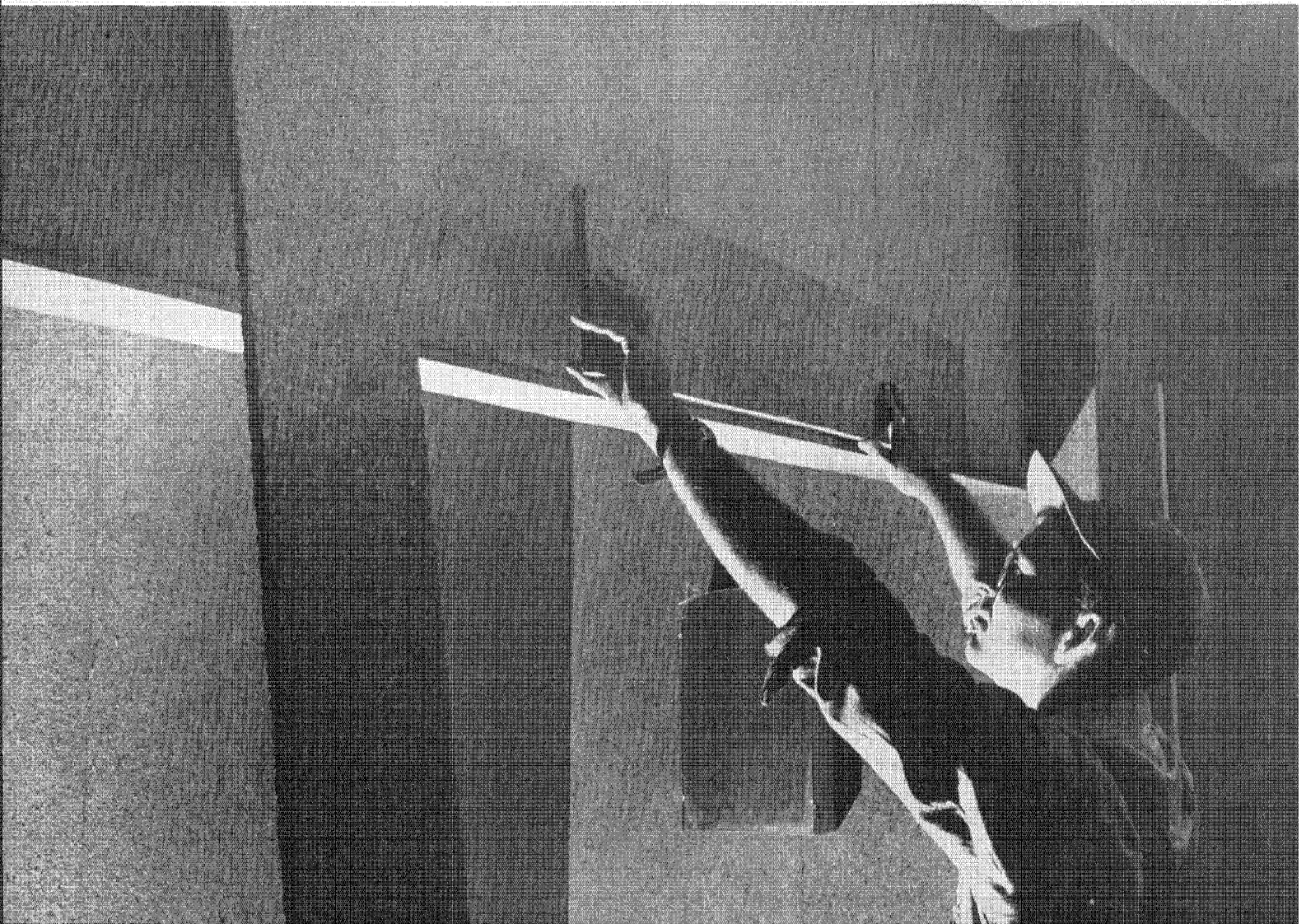
great quantities—thousands of tons—of waste wood.

One of the largest companies in this industry is The Plaswood Corporation of Detroit, Michigan. Operating under a patented process, mills at Hope, Arkansas; Wilton, New Hampshire; and South Nelson, New Brunswick, Canada are producing plaswood at the rate of about 150,000 square feet daily.

In the Plaswood process, waste wood is reduced to fingernail size by chipping and grinding. Then the wood particles are dried. The treated material is coated with a synthetic resin and formed into straight or curved boards under heat and pressure.

The Plaswood Corporation makes its own adhesive by combining formaldehyde with Du Pont crystal urea, a white, crystalline chemical that has a variety of uses in many other industries. The urea

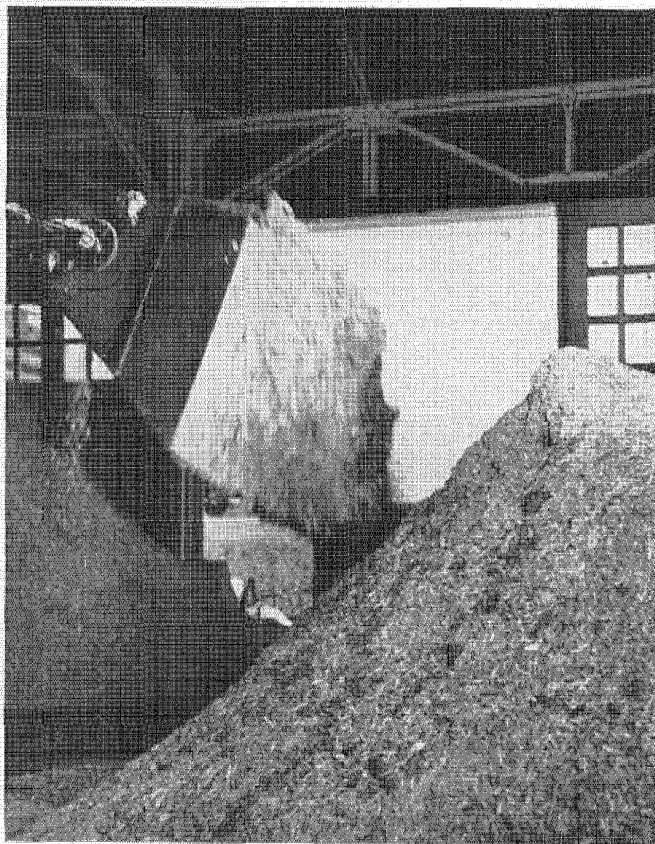
Plaswood, like wood, may be sawed, planed, nailed, sanded and drilled. Here it's being used for paneling.



formaldehyde adhesive imparts strength and water-resistance to the new board and makes it resistant to attack by fungus or termites. In contrast with other types of synthetic resins, Plaswood reports that the urea resins give better physical properties at a considerably lower cost. They are also more readily available and easier to formulate.

Plaswood has a hard surface that will not scratch, dent or mark easily. Like wood, it may be painted, sawed, planed, nailed, sanded and drilled.

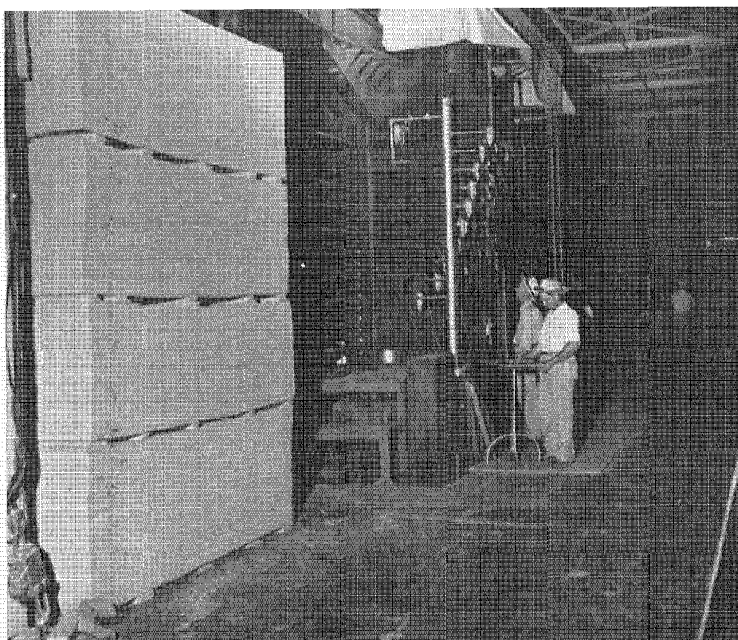
Plaswood products are being used currently as core stock for plywood and furniture where the dimensional stability of the new product is an important



factor. They are also being used as an underlay for linoleum and asphalt tile, in roof decking, and for partitions. The Federal Housing Authority has tested and approved the use of plaswood for exterior sheathing, subject to the same limitations which govern the use of all fiber board for this purpose.

Plaswood is outstanding as a core for plywood and decorative plastic laminates, because the lack of grain direction minimizes warping, and the continuous surface eliminates raised or sunken joints. Furthermore, plaswood furniture cores cost approximately one-third less than conventional lumber ones. Curved plaswood is being used to make chair backs. Other molded pieces are being tested for many more uses.

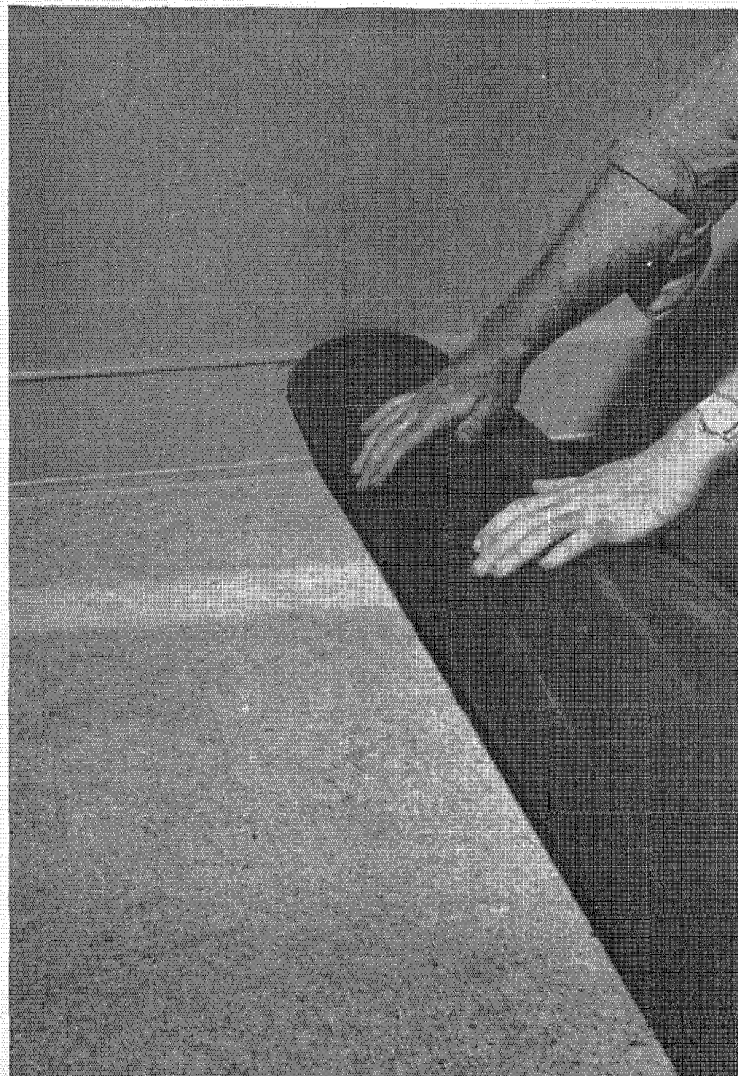
You don't have to be a conservationist to appreciate the invention of plaswood. But the fact that thousands of tons of waste wood already have a rebirth of usefulness promises increased benefits in the future.



Plaswood is formed under both heat and pressure in large presses like the one shown in the background.

Wood waste is the chief ingredient of plaswood, and it is ground and chipped to fingernail size. Urea resin is used as the binder to make a strong and water-resistant board.

Plaswood is versatile. Uses range from core stock for plywood and furniture to underlay for linoleum.

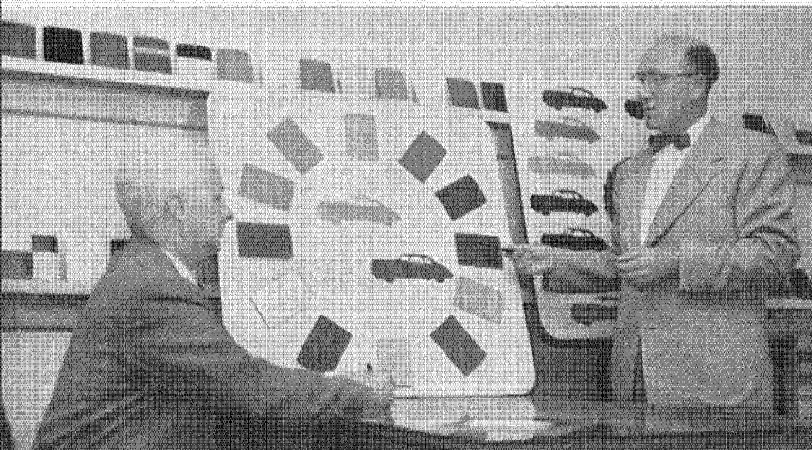


New car colors

Ever Hear of Como Blue, Pebble Tan or Yuma Beige? They're samples of the popular new pastels you'll be seeing on the 1952 models

DETROIT, MICHIGAN

This is the high point of the year in the Motor City—equivalent to magnolia time in Charleston or the Mardi Gras in New Orleans. The work and planning of many months are over, and the cars Americans will buy in 1952 will soon be rolling off the assembly lines onto showroom floors.



Du Pont Refinish representative, left, gets lowdown on car colors for '52. He can now start production wheels turning.

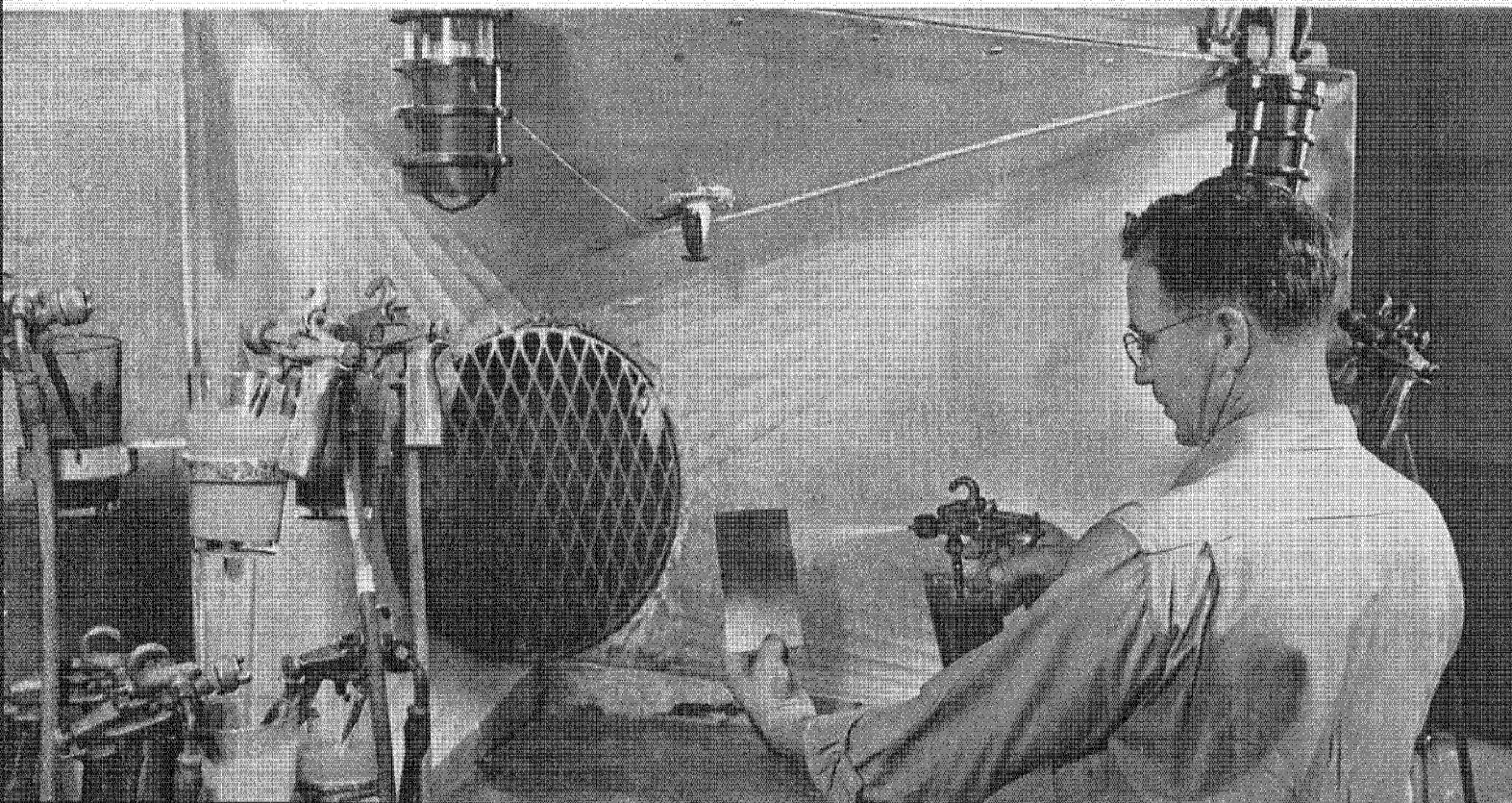
One thing a visitor notices immediately is that this season's models are decked out in more attractive new colors than ever before. Industry spokesmen say there are a third again as many new car colors this year as last. The explanation is that, with the uncertain defense picture holding up most major model changes, the accent is on the car's finish.

The motoring public's current preference for light colors—grays and greens are special favorites—is reflected in the 1952 lineup. At least half of the colors being introduced are pastels. The darker colors are principally metallic finishes. Two-tone paint jobs are common, a trend stimulated by the popularity of hard-top convertibles.

Color selection in Detroit is a year-round business. As a rule the initial plans for the new colors are drawn up by color specialists. But later, because of the many technical problems involved, top production people as well as promotion men, creative stylists, and color experts work hand in hand to come up with colors that are not only beautiful to look at but are also exceptionally durable. The results of their combined efforts are given such melodious names as Cherokee Red, Belfast Green, Potomac Blue, Fanfare Maroon and Oriole Gray.

Picking names for the new colors sounds easy, but

Sharp-eyed color shader in finishes plant sprays sample of "Duco". It must match auto maker's color standard perfectly.



it ain't necessarily so. This year, for example, one sales promotion manager turned down Miami Sand on the theory that loyal Californians wouldn't buy it no matter what it looked like.

Du Pont watches the color selection process with more than ordinary interest. Since 1923 the Finishes Division has maintained close personal contact with automakers through on-the-spot color specialists. These experts submit color samples of "Duco" automotive lacquers and "Dulux" enamels to the manufacturers far in advance of the new car season. Some of the colors suggested are accepted as is; others are modified to meet the individual manufacturer's ideas. The success of the service depends on the ability of Du Pont color specialists to keep abreast of the constantly-changing color trends in the industry.

To stay ahead of this demand for new colors requires continuous experimentation and testing by Du Pont. A couple of years ago, for example, the Company's Pigments Department came up with a new pigment called BON Maroon. The Finishes Division Laboratory in Philadelphia dispersed BON Maroon in lacquer and sent test panels off to Florida for exposure trials. Many more experiments followed before the working properties of the finish satisfied auto plant requirements. Now the new "Duco" lacquer color is being introduced on a popular-priced 1952 model. It has a highly durable finish and a warm, rich tone.

An interesting phase of the color story is the part

played by the Du Pont Refinish Sales section, which supplies car dealers and refinishers with ready-mixed colors to match all the new models. As soon as colors have been selected by the auto manufacturers, a Du Pont Refinish representative in Detroit starts the production wheels rolling. By the time the new models reach showrooms the new colors are available to car dealers and refinishers all over the country. This requires quick action on the part of all concerned in the Refinish distribution system, right from sales through the 37 Refinish warehouses to Du Pont jobbers. A typical Du Pont Refinish jobber has salesmen out servicing his car dealers and refinisher customers soon after the new car color information has been released.

Car dealers are the heaviest users at first because when a new model comes through from the factory with a scratch, it must be repaired—immediately and perfectly. Later on, the nation's refinishers become the heavy users to meet the demand for touch-up and over-all car refinishing in the new colors.

Planning for the 1953 models is already some months along. As part of it, new finishes in which automakers have shown an interest are now being tested for exposure characteristics in the Florida sun. Other samples are being made up in Du Pont laboratories.

"Anyone with experience can build a car that takes you where you want to go," said a car stylist recently. "What we insist on is a car that will be a pride to own. Color is an important part of its esthetic appeal."

From our columns

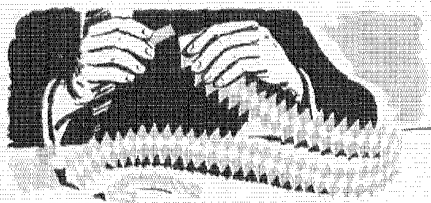
10 YEARS AGO . . . (Du Pont Agricultural Blaster, 1912)

"One of our enterprising California agricultural blasters has just closed a contract to clear a large area of land controlled by an English syndicate, at the head of which is a British Lord of the Realm. Lords, dukes and kings all look alike to our blasters. They would just as soon have their money as the coin of good American citizens."

"Over a large part of many western states the old buffalo wallows are still a nuisance in the fields. To remedy this at a trifling cost drive a round steel bar into the center of the wallow, and touch off a half stick of Du Pont dynamite in the hole. Your bog hole will be no more and you will grow better crops on that spot than in any other part of the field."



20 YEARS AGO . . . (Du Pont Magazine, 1932)



"Millions of people are collecting package wrappers of cellophane . . . and buying the colored sheets at stationery and chain stores to make belts, cigarette cases, handbags, lampshades and other useful articles . . . No one seems to know where the idea was first developed, but when a Hollywood actress was seen wearing a cellophane belt, thousands of people wanted to know pronto how they were made."



Best dressed gifts of '51

Want to give your packages a personal touch?

It's easy with rayon ribbon

Unfortunately, in our era of store-bought gifts, it's easy for holiday presents to seem "canned" and impersonal. They're sold by rush-harried salespeople, bought by crowd-harried shoppers, and paid for in cold currency. Of themselves, they often have about the warmth and individuality of a K-ration.

The remedy, it seems to us, is not for Grandmother to get out her knitting needles and make personalized gifts for the family—or any such back-to-the-soil procedure. Simply by packaging them interestingly, store-bought gifts can be given a lot of personality.

Making package creations is easy and fun. Starting with good-looking wrapping paper and lustrous ribbon of Du Pont rayon, you can easily turn out

novel hearts, bells, butterflies, pompoms, or elegant formal bows.

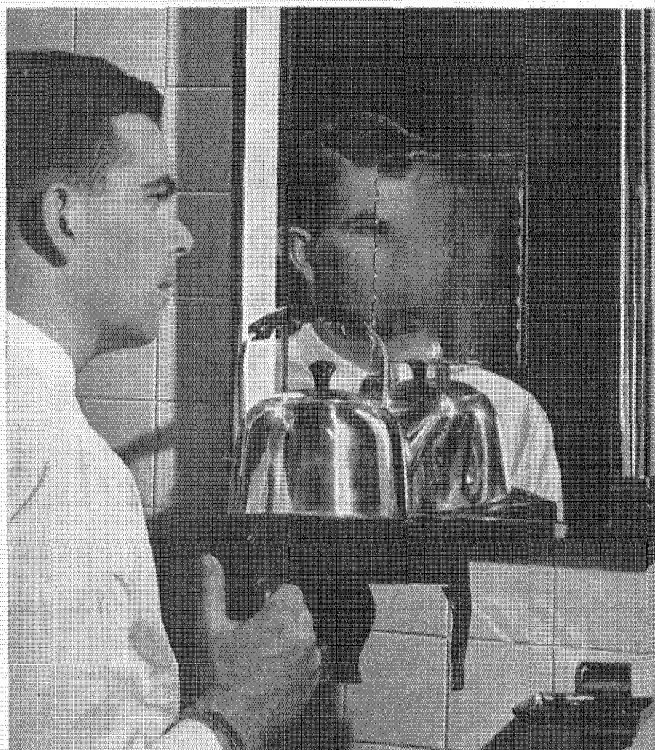
If you'd like to try your hand at some of these, you might want to drop a line to Chicago Printed String Company, manufacturer of "Satintone Ribbonette." The address is Room 12, 2300 Logan Boulevard, Chicago 47, Illinois. Their gift wrapping division, "Tie-Tie" Products, offers an instruction folder that shows how simple it is to make clever packages.

"Satintone Ribbonette," made of Du Pont rayon fibers held together by an adhesive, is durable and strong, yet gracefully pliable. It's available in many colors—in either a crimped or smooth finish—at the wrapping counters of leading gift, stationery and department stores.

Even if you don't feel artistic, though, you can still have novel bows of rayon "Ribbonette." The employes of many gift wrapping departments across the country have been specially trained to make them for you.

What's New

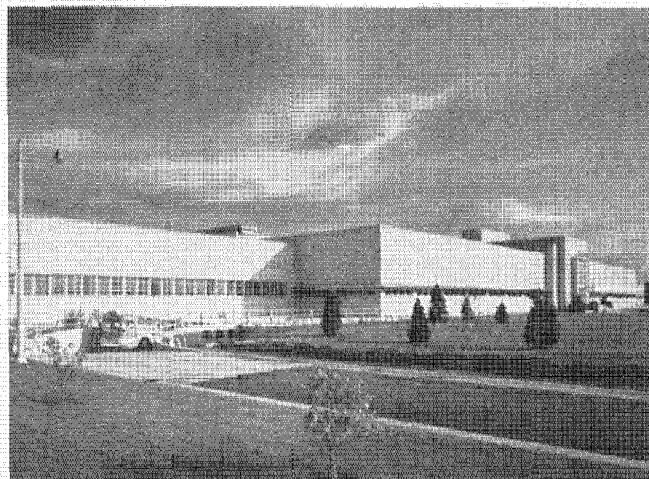
● **SUBSTANTIAL PRICE CUTS** on "Marlate" methoxychlor and EPN-300 insecticides were announced recently by Du Pont. The reductions were made possible by increased sales volume. EPN-300, for example, recommended only for control of orchard mites when it was introduced 18 months ago, is now used against several insect pests.



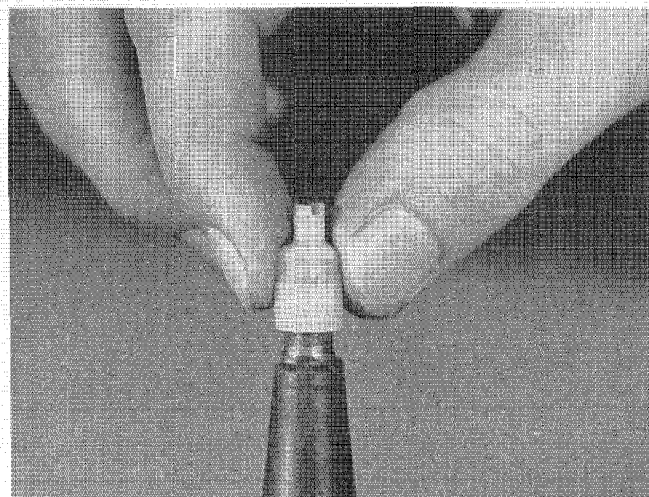
● **NO BATHROOM FOG.** Steam cannot fog the mirror of this bathroom cabinet manufactured by Charles Parker Company, Meriden, Connecticut. Note how ordinary mirror in center of picture is fogged by steaming kettle. An electric heating element made with a special conductive compound of Du Pont neoprene keeps the glass warm enough to prevent condensation. The chemical rubber was chosen because of its heat resistance.

● **WHAT CARTRIDGES FIT** what rifles, pistols and revolvers? This is the information contained in two new folders. For free copies of "Remington Gun and Cartridge Adaptations," and "Peters Gun and Cartridge Adaptations," write the Advertising Department, Room D-8, Remington Arms Company, Inc., Bridgeport 2, Connecticut.

● **NEW COLORS FOR NYLON** that give superior sun and water fastness are now available from Du Pont. Trade-marked "Capracyl" dyes, the colors will be especially useful on nylon sport clothes, beachwear, upholstery, and other fabrics exposed to sun and moisture. They also give similar color fastness on wool and wool-nylon blends. For information write Dyestuffs Division, Nemours 2504, Wilmington, Delaware.



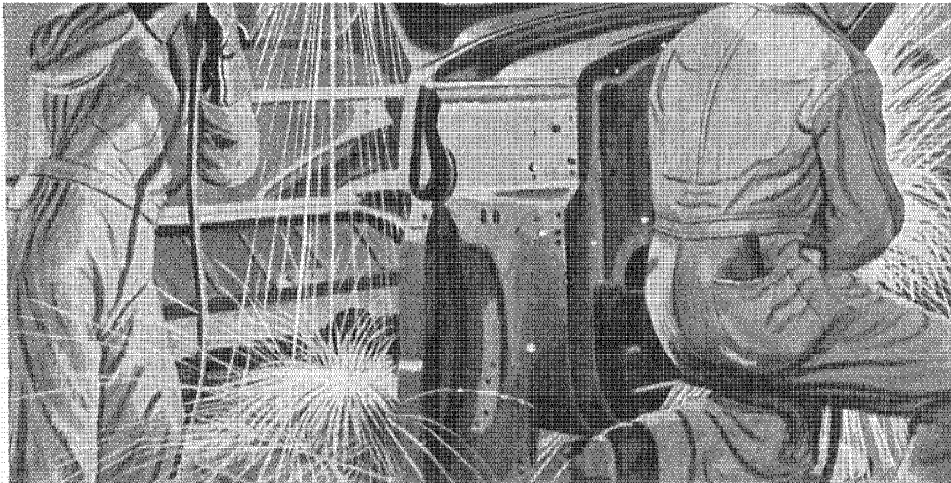
● **NEW PHARMACEUTICAL PLANT** of the Upjohn Company, near Kalamazoo, Michigan, has 120 separate air conditioning systems to meet exacting needs of various departments. Combined, the systems move 2,810,000 cubic feet of air a minute. Refrigeration units use "Freon" fluorinated hydrocarbon refrigerants—safe because they are nonflammable, nonexplosive and virtually nontoxic.



● **TIRE VALVE CAPS** of Du Pont nylon plastic are a new product of the Dill Manufacturing Company of 700 East 82nd Street, Cleveland, Ohio. The caps make an airtight seal, won't chip or split, and resist corrosion. They come in three styles, including the "screwdriver" type above.

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FOR ADDITIONAL INFORMATION on any of the products or services mentioned in this issue write the Editor, Du Pont Magazine, Wilmington, Delaware.

Safer living

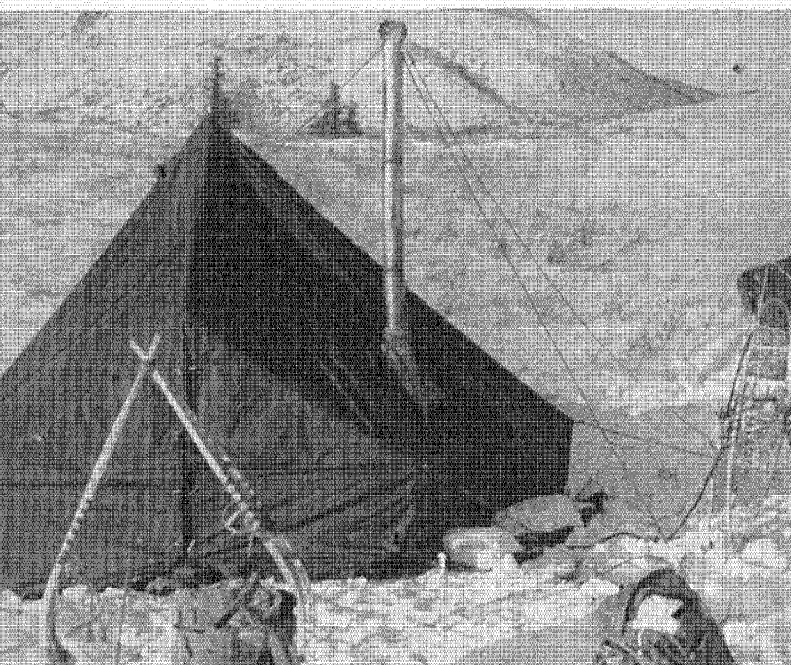


... is promised for both soldiers and civilians by new uses of "Erifon" flame retardant ...

A new type of tent is making life more comfortable for our soldiers these days. It is light and pliable enough for one man to put up even in the coldest weather, yet the tent has two layers instead of the usual one.

The outer ply is a tightly woven fabric of the type tested by Admiral Byrd in the Antarctic, and the inner one is a light industrial sheeting that looks like sugar sacking. Between the two is an air space for insulation. This construction keeps moisture from condensing on the inside of the tent and dripping on the occupants, but the treatment given the cloth is equally important to the comfort and safety of the men. Both layers are treated with "Erifon" flame retardant so that stoves can be used inside the tent.

How many of the new tents is the Army using? No one is giving out exact figures, but millions of yards of this tenting have been bought by the military.



The same properties that make "Erifon" promising for civilian awnings, tarpaulins and clothing won Army approval for the new tents. "Erifon" flame retardant leaves the pores of a fabric unclogged so that moisture can escape. This is as important in tents as in jackets or overalls. And cloth that has been through a bath of the chemical does not get sticky in tropical heat, or stiff in polar cold.

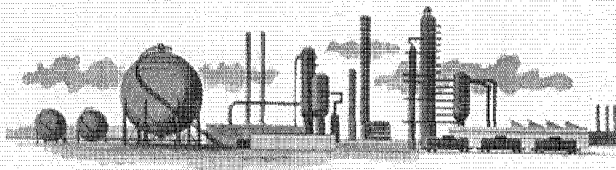
Production of the flame retardant is being increased, although it is a relative newcomer among Du Pont products. Its development came from a study of titanium chemistry by the Pigments Department. When it was introduced two years ago, we pointed out that "Erifon" makes cotton, rayon and other cellulose materials flame retardant. It retards combustion so that these flammables, if ignited, won't continue to burn and spread fire. "Erifon" is a complex chemical mixture, and must be put on the cloth in a textile mill where application can be carefully controlled. Dry cleaners and laundries aren't equipped to do this.

New applications are being studied. Experiments in service labs, for instance, show that it's feasible to treat drapery fabrics for hotels, theaters, schools and other public places. Properly treated fabrics exceed the requirements of Federal and private flameproofing tests, and they stay flame resistant after long weathering or repeated washings and dry cleanings.

Another group interested in "Erifon" are clothing manufacturers. They are now evaluating treated cotton work clothes for men who work near fire hazards. Suits and overalls for welders, steel mill workers and others are in actual use to see how well they stand up. If results are as good as expected, scientists will be much closer to their goal of a simple flame-resistant treatment to reduce loss of life and property from fire.

Fabric used to make new 2-ply Army tent is treated with "Erifon" flame retardant. Stove can be used inside tent.

The octane counters



Du Pont's motor gasoline survey benefits the motorist as well as the oil industry

If you should pull into your favorite service station around New Year's Day and find a stranger having a gallon can filled at the gasoline pump, don't jump to any conclusions. He may be out of gas—or he may be one of 31 Du Pont representatives collecting samples of gasoline at selected stations from coast to coast.

The roundup of samples from some 40 American cities marks the beginning of the Du Pont motor gasoline survey, conducted quarterly by the Petroleum Chemicals Division to determine the antiknock rating and tetraethyl lead content of motor fuels marketed throughout the country.

The whole survey operation, from sample collection to delivery of published results, is completed in three weeks or less. The schedule requires some fast leg work. One Du Pont man, for example, picks up samples at 24 service stations in Denver, Colorado; Casper, Wyoming; Great Falls, Montana, and Aberdeen, South Dakota. He flies from city to city to meet the deadline.

Altogether, as many as 700 samples of regular and premium grade gasoline are collected. They are rushed for analysis to the five district laboratories of the Petroleum Chemicals Division. The data are checked there, then air mailed to Wilmington for further checking and tabulation. To save printing time, as many pages as possible are set up before printing deadline. Only the final figures have to be dropped in at the last minute.

This emphasis on speed is the secret of the survey's value to the petroleum industry. Oil refiners and marketers want the information while something can still be done about it. One company's fuel octane

rating can't lag behind that of another for long—not in the oil industry.

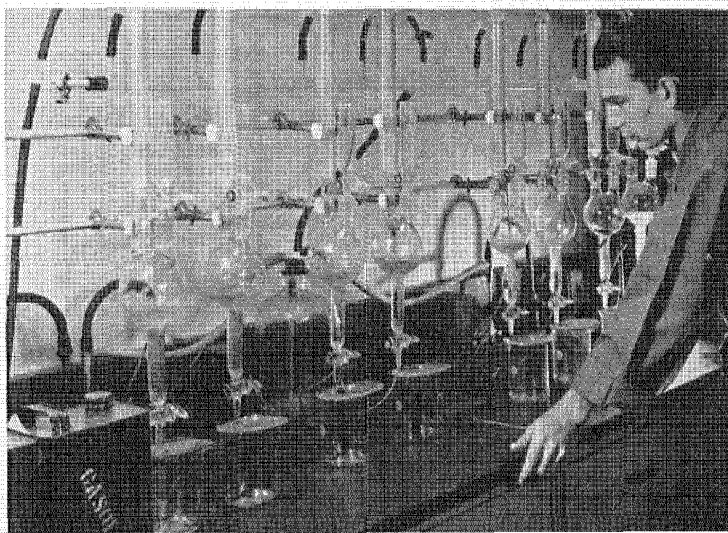
Competition among refiners, spurred by pressure from automobile engine designers for higher antiknock fuel, has been of real benefit to the motorist. Between 1930 and 1950, for example, the octane number of regular gasoline rose from 60 to 84, and that of premium from 74 to 90 plus. The result of fuel-engine improvement over the period has been a gain of 30 per cent in fuel economy, according to a recent study by an automotive research laboratory.

In planning its quarterly survey, Du Pont gives careful consideration to selection of brands, number of samples and the choice of cities, so that reliable conclusions on trends can be drawn. Brands chosen are believed to be representative of the range of quality offered in a particular area, and samples are taken from service stations appearing to have a reasonable turnover. Brand names are coded in the printed report, and each refiner is given the code for his own brand only.

The survey serves a secondary purpose, too. Occasionally the Du Pont laboratories will come up with a gasoline sample containing more tetraethyl lead than is permitted by the government. As a manufacturer of TEL and an adviser on the proper handling of the antiknock fluid, Du Pont can point out the condition to the refiner.

The first of these survey reports was mailed out two years ago. A measure of their popularity is the fact that twice as many copies are being distributed now. In giving the oil industry an up-to-date self-portrait, Du Pont feels that it is also performing a service for the industry's final judge, the American motorist.

Gasoline samples bought in 40 cities are tested for antiknock rating and TEL content at Du Pont laboratories.





Give a boy a gun for Christmas

Want to make a boy happy this Christmas? Then give him a gun of his own. It makes no difference whether it be a highly engraved custom-built small gauge shotgun or a reasonably priced .22 caliber single shot rifle; if it is "all his own" one of the chief desires of his young life has probably been realized.

Young America's desire to possess "a real hunting gun" is traditional. He considers the privilege a recognition that he has attained the age of responsibility, and that his parents consider him capable of handling firearms in a careful and safe manner.

"How old is *old enough* for my boy or girl to handle firearms?" is a question that has puzzled many parents. Usually youngsters are ready to start shooting when they have shown a sense of responsibility in other fields. This may be at 12, 13 or 14 years of age.

How can a parent know that his child has a sense of responsibility? By asking himself a few simple questions, such as: "Would I trust him to carry the neighbor's baby across the street, or take a \$20 bill to the grocery store, or carry a really important and confidential message, or look after the house for a day while I'm away?" The answer to these questions will help guide you to a decision.

A boy's first gun is usually a .22 caliber rifle, and properly so because it is easier to teach basic shooting principles with this type of gun. Once you have given it to him, it is your duty to see that he

learns to use it safely and properly. If you are not a sportsman, discuss the matter with some friend experienced in such affairs. It will be best to arrange for the youngster to attend a class sponsored by some club affiliated with the National Rifle Association. Here he will have the benefit of expert guidance along with other pupils of his own age, which will make the training period all the more pleasant for him. If this is not possible, ask some friend who is a competent instructor to give your youngster the right start. (Full information on shooting instruction may be obtained by writing Rifle Section, Promotion Division "C", Remington Arms Company, Inc., Bridgeport, Connecticut.)

Completion of a course in gun handling does not necessarily mean that a boy is qualified to go target shooting or hunting alone. He needs adult supervision for a year or two so that he will know, and become imbued with, all the rules of safety on the rifle range or in the woods and fields.

Shooting with a .22 caliber rifle is not an expensive sport. Remington Arms Company, Inc., a Du Pont subsidiary, has been a leading manufacturer of sporting firearms and ammunition for many, many years. They produce an inexpensive line of .22 caliber rifles that will delight the heart of a youngster, and the cost of Remington .22 ammunition is nominal. But regardless of cost, when you give a youngster a gun, you give him a lifetime of shooting pleasure.

Yes, color in operating rooms

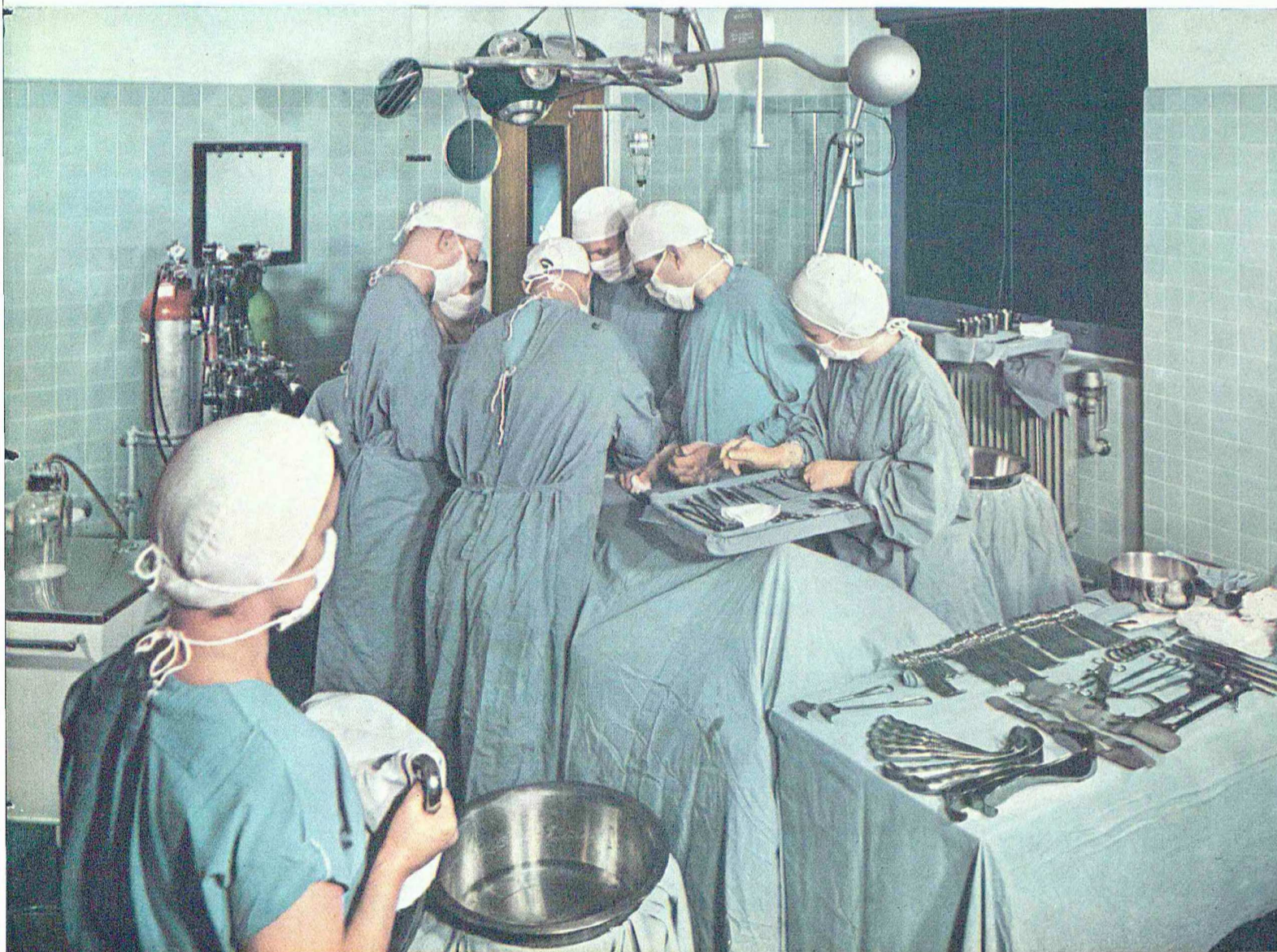
To most of us, spotless white in hospital linens is as symbolic as red for fire engines. But if you haven't seen an operating room lately—and we hope you haven't had to—take a look at the colorful one below. It's in The George Washington University Hospital, Washington, D. C., and illustrates what's happening in many hospitals throughout the country.

The growing trend toward color is not a matter of prettiness. It's a calculated, scientific affair. "To a surgeon, white is just an uncomfortable glare," says Victor F. Ludewig, superintendent at George Washington. "Color reflects less of the bright light focused on the operating area. So a surgeon's eyes don't tire so quickly. Besides, different colors in different parts of the hospital make it easier to sort linens in the laundry. Green for one area isn't mixed up with blue for another."

Some hospitals use dyes in their own laundries. But Ludewig reports that his institution prefers to buy linens already dyed by the manufacturer. "It costs a little more at first," he tells us, "but that's more than compensated for. Mill-applied fast dyes last much longer, and don't take up time in our laundry room. They give us more uniform shades than we could get ourselves, and save the cost of frequent redyeing."

Men of Du Pont's Dyestuffs Division say much the same thing about the use of color. For years, hospitals have been writing to Du Pont for information on colored linens. The advice they receive has always been the same: take advantage of the extra-quality service you get from fast vat dyes applied by the textile industry. They keep colors on the job longer with less inconvenience and with greater long-run economy.

"It's easier to work around colored fabrics—less glare," we were told by one of the surgeons pictured below.



"You're a mighty smart shopper, Mrs. Gray"



HERE'S HOW CELLOPHANE HELPS YOU GET YOUR MONEY'S WORTH



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KEEPS FOOD CLEAN. Food goes in your mouth—and your family's. If you buy it in Cellophane, you know it's safe from dust, dirt, flies. And no other shopper's handled your food in "touch-me-not" Cellophane packages.



KEEPS FOOD FRESH. Food in Cellophane is fresher in the store—and *stays* fresher at home. To reseal the package, just twist or fold the wrapper shut: bread stays fresh, potato chips crisp, vegetables garden-crisp. You save waste, use all you buy.



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