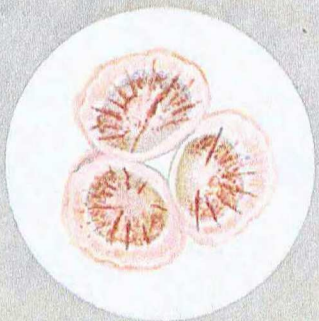
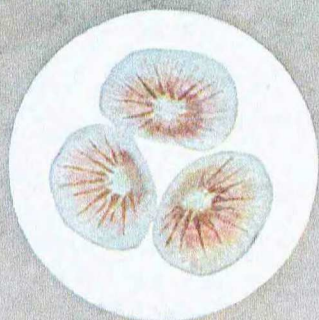
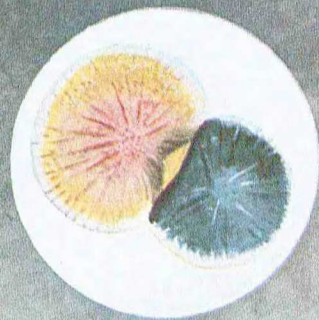
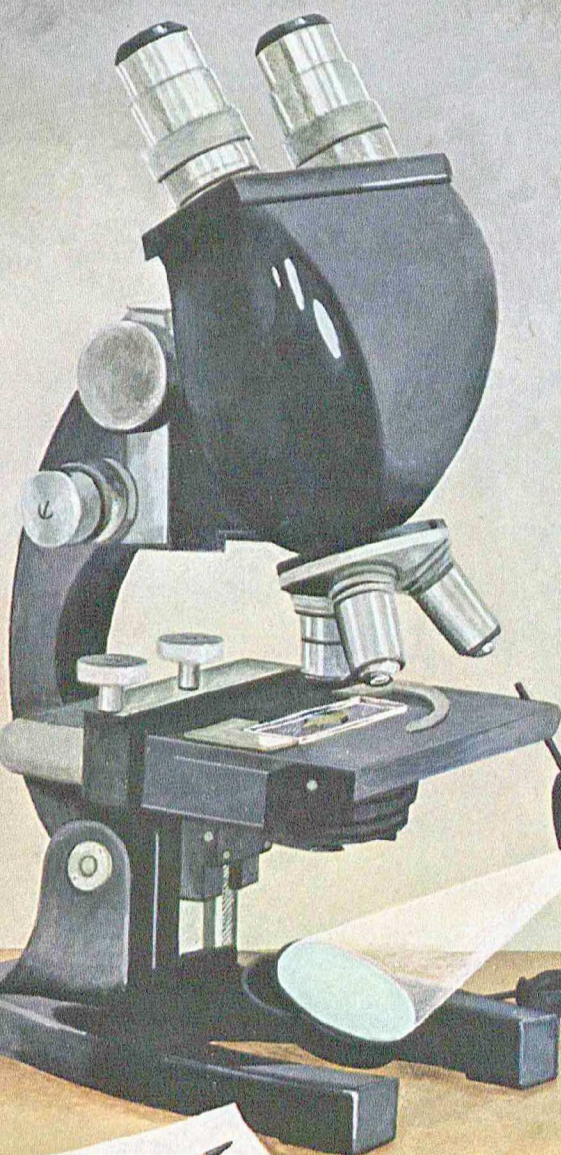


Scientific

December 1953 • January 1954



DUPONT
THE KODAK COMPANY



you want **PETERS** 'High Velocity'"

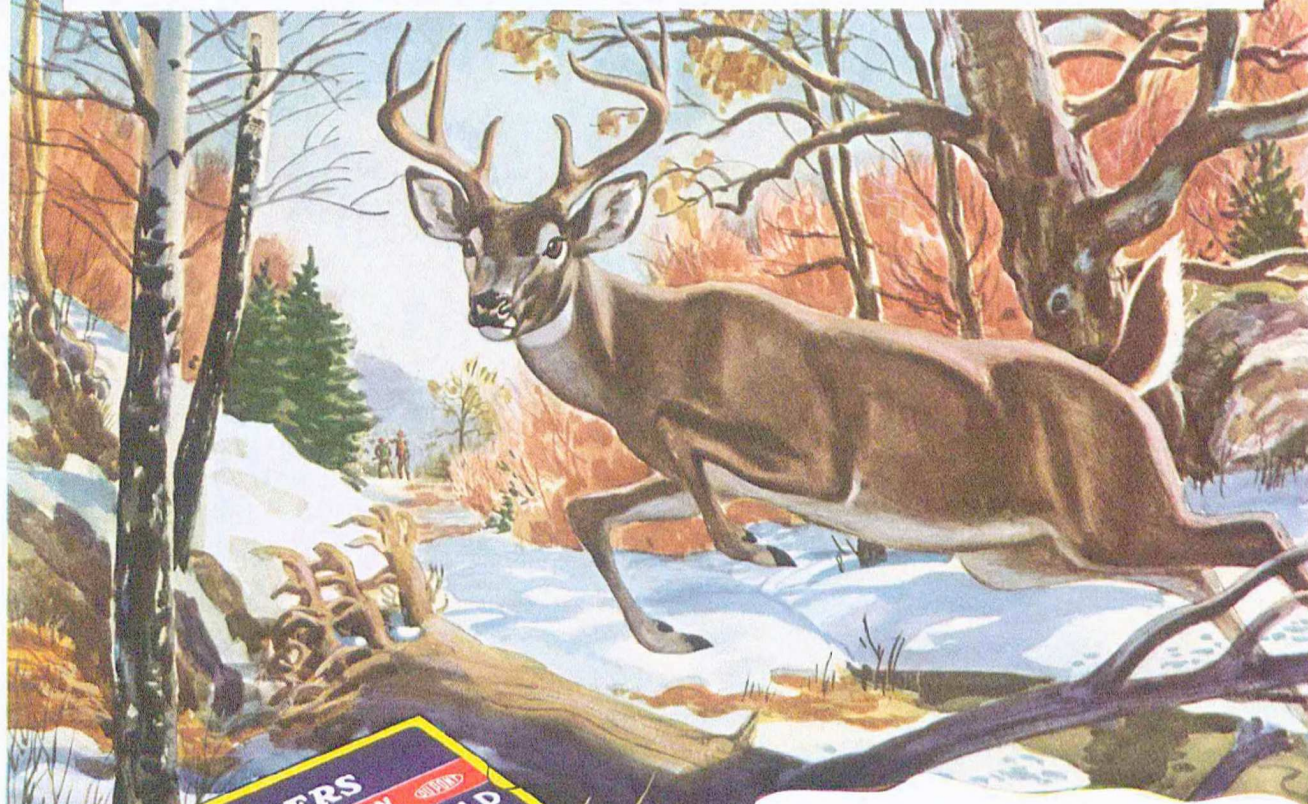
says H. C. "Bill" Fisher, Findlay, Ohio

"I've been going on hunting trips a long time—longer than I'd like to admit—and have brought down a lot of game. Many of my shots have been at long range. But with Peters 'High Velocity' ammunition, I've never worried about knocking down a deer, antelope, or bear—if my aim was right.

"For my money, only Peters 'High

Velocity' packs the power you want on long, difficult shots."

Take it from an expert like Bill Fisher and try Peters "High Velocity" ammunition on your next hunting trip. For any make of modern American gun . . . there's no more powerful ammunition in the world than Peters "High Velocity."



ASK YOUR DEALER for Peters "High Velocity" big-game cartridges. Peters gives you a wide variety of bullet types and calibers. "Inner-Belted" or Protected Point Expanding bullets penetrate deep . . . deliver smashing power. Other features—uniform bullet, minimum disintegration in heavy big game, "Rustless" non-corrosive priming for split-second ignition.

PETERS

packs the

POWER



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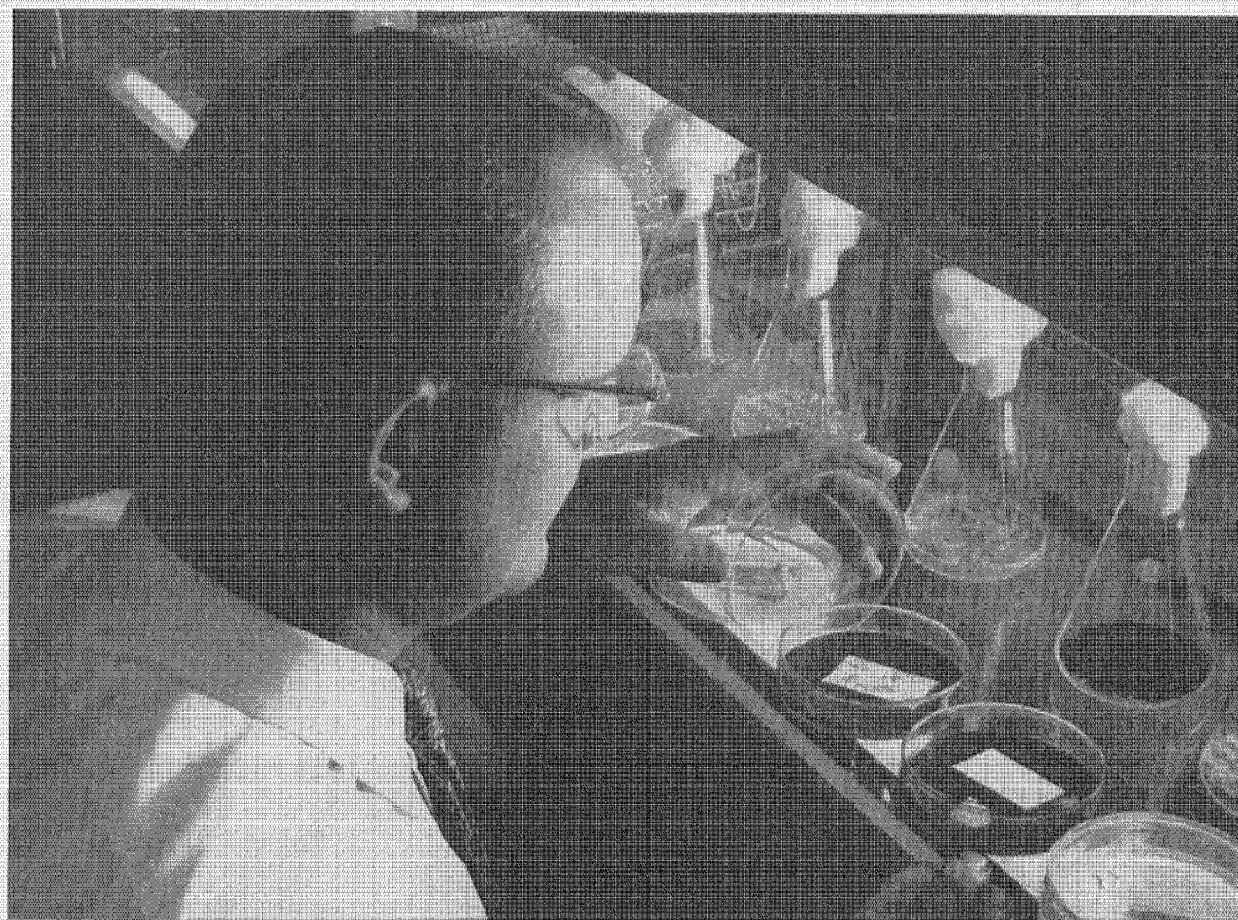
JAMES H. McCORMICK, Editor

Associate Editors, GORDON H. KESTER
MARY ELLEN EVANS

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For more than 30 years Du Pont scientists have been developing new and better fungicides. This fifth in a series of cover paintings and lead articles on our major research activities covers the Company's . . .

War on spores

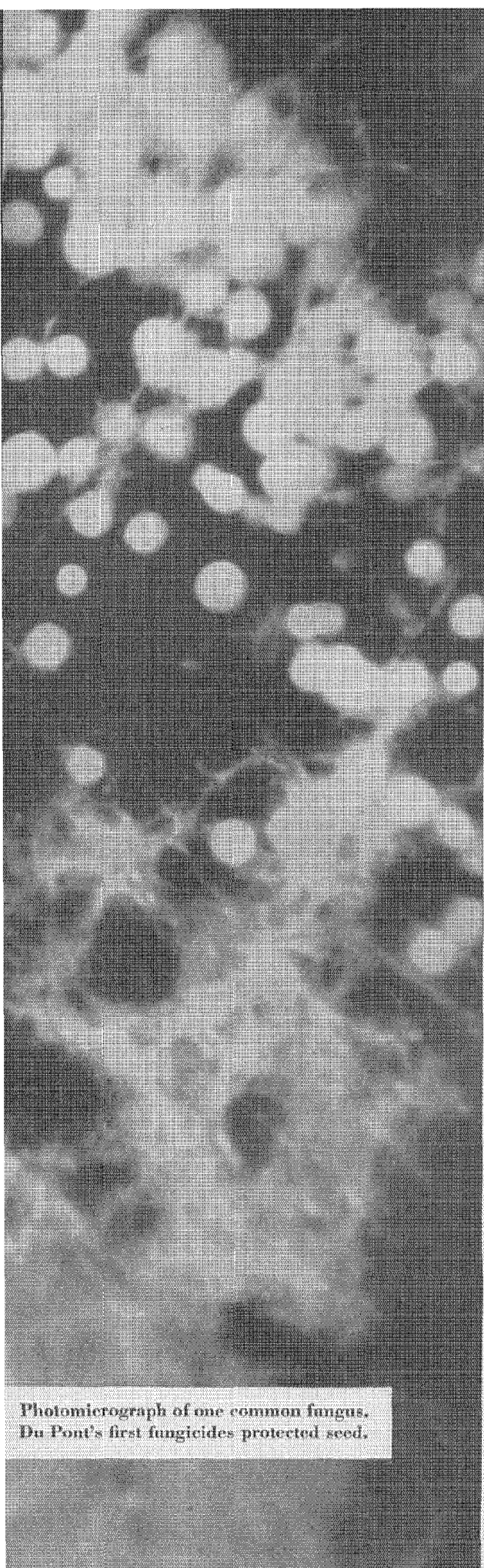


By JAMES H.
McCORMICK

It was 1931, and the Great Depression was just beginning to make itself felt. At Du Pont research continued, and at his lab bench Dr. W. H. Tisdale dusted spores of barley smut into a test tube and added a solution of a chemical obtained from the Company's rubber chemicals laboratory. It was labeled sodium dithiocarbamate. He followed his usual procedure, centrifuging the mixture and then planting the spores on culture plates to grow. But the spores didn't grow; they were dead. Even though the test was repeated time and time again until only one part of the chemical

remained to 25,000 parts of water, the smut spores did not germinate. More tests of dithiocarbamate salts followed—on mildew of roses, wood-staining fungi, apple scab, and others. Each time the chemical killed quickly, and a major new family of fungicides was on the way.

This discovery highlighted the eleventh year of Du Pont's war on spores. Way back when the Company was recruiting technical brains in Europe after World War I, it had engaged Dr. Max Engelmann, who had done some work on mercurial compounds as



Photomicrograph of one common fungus.
Du Pont's first fungicides protected seed.

germicides and fungicides. At Du Pont he had continued this study, and from it came products that are now standards: "Semesan" seed disinfectant for control of fungi attacking vegetable seed; "Ceresan" seed disinfectant for coating grain; and "Lignasan" fungicide for treating green lumber to control fungus sap stains.

Dr. Tisdale's strong lead on the dithiocarbamates galvanized the Company into action, and agricultural fungus disease study was expanded and centered in the Grasselli Chemicals Dept. While the new dithiocarbamates were taking the literally hundreds of separate steps from the first screening to commercial acceptance, another study was begun. This time the goal was an entirely new type of seed disinfectant that would open the way to protect other types of crops. The goal, when reached, proved to be an organic sulfur compound, a first cousin of the dithiocarbamates. The product was named "Arasan" seed disinfectant, or, when compounded to control brown patch and dollar spot on turf, "Tersan" 75 fungicide.

A few years later, "Fermate" fungicide reached the final testing stage—but with two strikes against it. A good fungicide, yes, but this iron dithiocarbamate salt was too expensive to compete with sulfur. Then "Fermate" scored the first of its successes in Connecticut, the home of high-priced, shade-grown tobacco for cigar wrappers. In some mysterious way, a fungus disease known as blue mold had begun wiping out the seedling beds. One year, blue mold was no problem. Three years later it threatened the whole Connecticut tobacco industry, and representatives of the Connecticut Valley Experiment Station at Windsor called for aid. Du Pont rushed ten pounds of the new chemical for testing on the 1941 crop.

The station director wrote this about the tests the next spring: "Hundreds of materials have been tested here and elsewhere, but it was only during the last winter that we finally found one which has given satisfactory results. This is a sooty black powder named 'Fermate'." Nowadays the fungicide is even more at home in the tobacco beds of the South than in those of New England.

SUCCESS ON APPLE TREES CAME NEXT

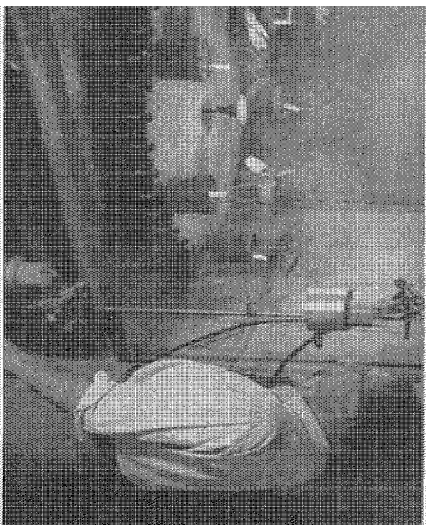
While tobacco growers were fighting blue mold, apple growers in New York were worrying with apple-cedar rust, a fungus that spends part of its life cycle damaging apples. Again a period of greenhouse tests was followed by ones on outside test plots—at the New York State Agricultural Experiment Station in Geneva, N.Y. in this case. Then applications were made on commercial orchards in the Hudson Valley. And again a spectacular success—plus an unexpected bonus. The compound not only prevented rust, but also showed up as a good control for apple scab, America's major apple disease. Recently we learned that the use of dithiocarbamates on Oregon pears is credited with increasing the crop by 300,000 boxes annually.

Du Pont researchers, finding that the iron dithiocarbamate salt was so good, quickly prepared ones in which other metals were substituted for the iron. The zinc salt, especially, was successful, and it was eventually marketed as "Zerlate" fungicide, recommended for control of certain vegetable plant diseases.

These new fungicides, however, couldn't any more control all important fungus diseases than penicillin and sulfa drugs can cure all human diseases. Grasselli biologists and pathologists continued to screen likely fungicide candidates.

Du Ponters also campaigned against industrial losses from fungi. Badly needed, for example, was a product to protect light-colored paints from dirty-looking mildew, particularly in factories where humidity was high, or on the shady north side of homes in coastal

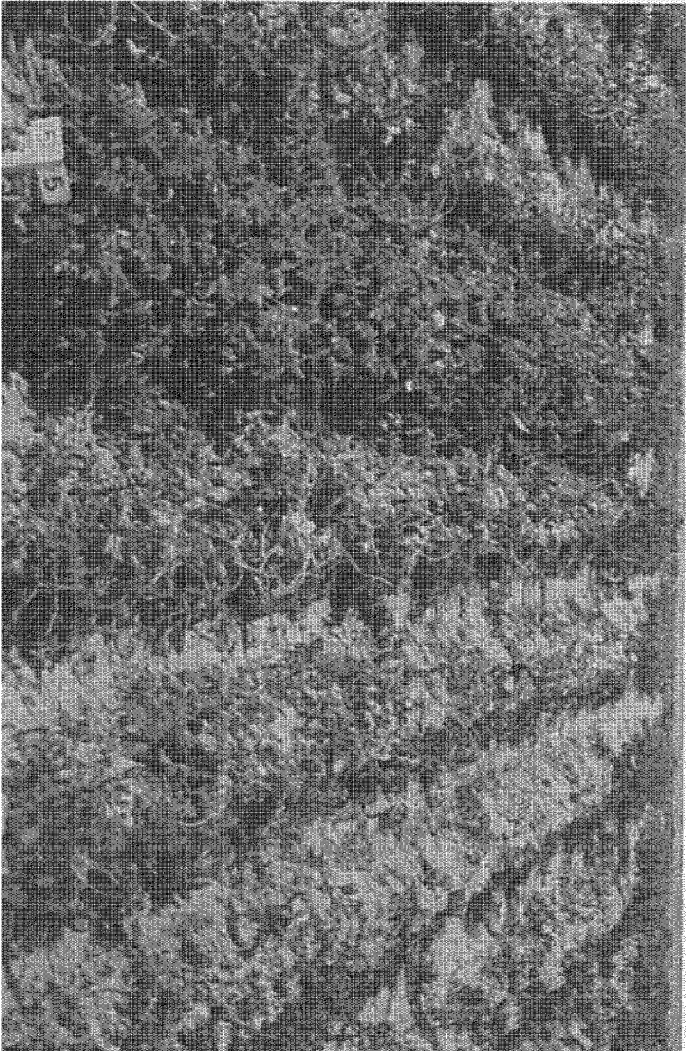
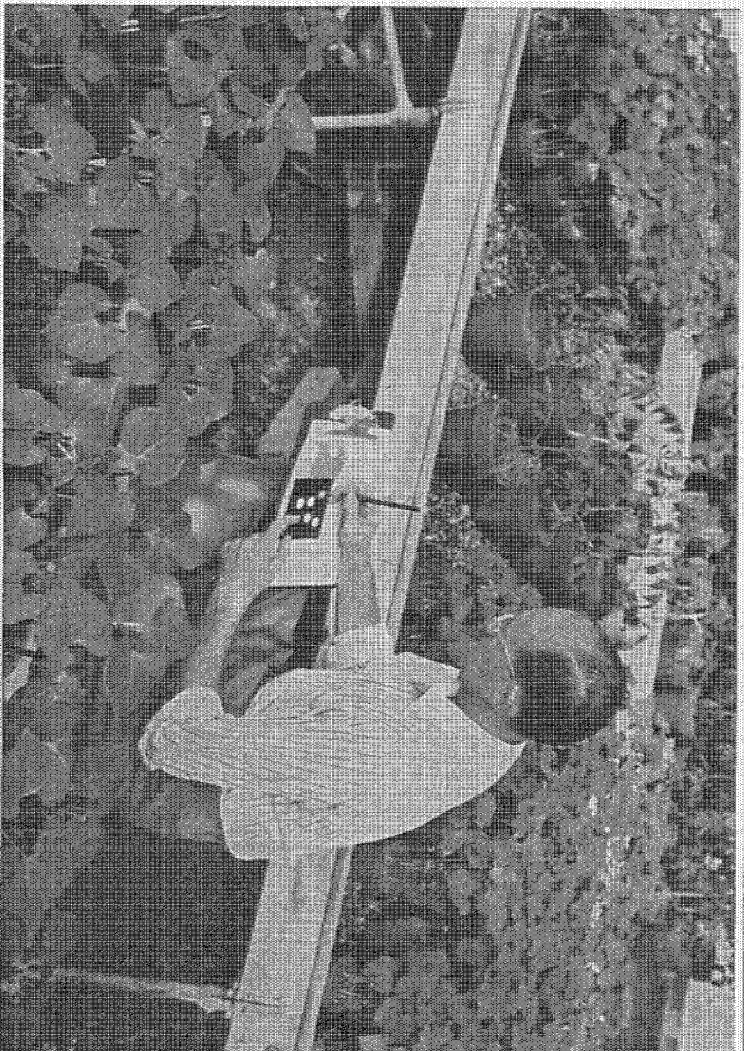
for making paint resistant to mildew.



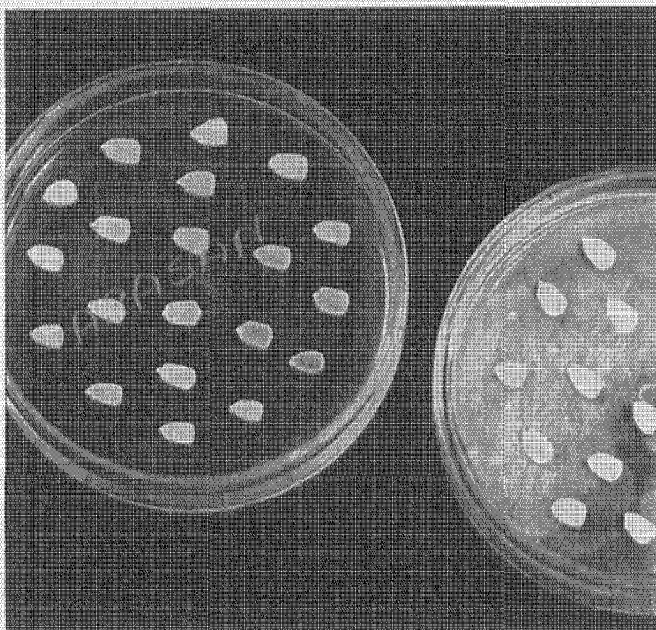
All fungicide candidates receive tests in greenhouse. Here beans are sprayed, and then later checked for rust damage.



Newest product of Du Pont research in field, "Manzate" fungicide, protects tomatos and potatoes against damage.



areas. At least four separate research sections at Du Pont have got into this act at one time or another. The Finishes Division, as early as 1930, was adding varying amounts of known and hoped-for mildew killers to samples of white and light tinted paints, and then testing to see what happened when mildew had a chance to rob the paint of its good looks. This was done either by painting small panels with the special finishes and exposing them on paint farms in Delaware and Florida, or by inoculating the panels with mildew spores and exposing them to simulated weather in the lab. When a test panel resisted mildew attack, factory or home tests followed. For example, panels of various mildew-resistant paint formulations were hung in humid work areas of a bakery or textile mill. Trained researchers followed the tests, and in



Destructive fungi organisms are flourishing on untreated corn (right), but seed disinfectant protects grain (left).

time successful candidates got full-scale tryouts across the country.

In trying out IN-2555 phenyl mercury oleate fungicide as a mildew-inhibitor for outside white paint, for example, homes were painted in more than a dozen cities and periodically checked for as long as ten years before the product got an unconditional go-ahead.

Back in the main ring where agriculture was being emphasized, "Manzate" fungicide, employing the manganese metal salt this time, was prepared by Dr. A. L. Flenner. This new manganese ethylene bis dithiocarbamate protected tomatoes against both early and late blight without harming the plant itself. Field trials, verifying greenhouse results, added anthracnose to the list of fungi to fall before "Manzate".

Then, in typical agricultural fungicide fashion, began six long years of tests by 75 to 100 non-Du Pont investigators. "Manzate" is a going product now; on a

recent check at the farm of W. R. Goodwin in Micco, Fla. an area treated with the new spore killer yielded 44 per cent more tomatoes an acre than an area of the same size sprayed with another formulation.

All of the manufacturing departments and the Chemical Dept. at Du Pont send likely chemical compounds to Grasselli for screening. The chemical is tried out, in varying concentrations, on greenhouse plants infested with various fungus diseases. Another Grasselli group at Delaware's Minquada experimental farm does the biological research on seed disinfectants. Their preliminary work includes study of seed protection in greenhouse plots, and fungus killing power against the various or specific organisms.

Fungicide candidates for inhibiting mildew on textiles, coated fabrics, or paint must, in addition to inhibiting mildew as completely and inexpensively as possible, be safe for the intended application.

Fungus resistance of products is also studied. To take a normal case, suppose someone wanted to check the mildew resistance of a new fiber. Samples of the yarn or cloth would be sent to the experimental labs of Grasselli where, in sequence, they would be wet with water containing the desired fungus spores, incubated in a constant temperature room for perhaps two weeks, rated for presence or absence of growth on the sample, and finally tested for such things as loss of strength.

...BUT FEW ARE CHOSEN

Few of the thousands of prospects pass all of the testing hurdles. Additional ones are passed over when production costs are considered, and finally management must feel a new product is enough better than existing ones to merit the further gamble in time and money required to bring it to market.

Present work and plans for future fungicide research at Du Pont are ambitious. Just being readied for full marketing is I&D seed protectant. It not only prevents attack on seeds such as corn and beans by seed-borne spores and by fungi in the soil, but also protects against such soil-borne insects as the seed corn maggot and wire worm. A universal seed fungicide is still the ultimate research goal in this field.

Work is progressing on improvements of present products, on fungicides to kill harmful soil-borne organisms, and on fungus diseases outside the killing power of present chemicals. On the industrial side, researchers are looking for ways to combine Du Pont's phenyl mercury oleate fungicide with a waterproofing agent, and to find stronger and even better mildew inhibitors for paints. "The need for better fungicides has by no means been fully satisfied," says Dr. Tisdale. "In fact, this need will grow with continued progress in agriculture and industry. The status of living things, whether plant or animal, is never static. With these constant changes, new problems arise. New strains of fungi and new strains and varieties of crops will develop which require special attention and treatment."

Popular with customers, packaged textiles are building sales

while cutting costs for retailers. No wonder packaging is . . .

A two-way winner

"Old concepts of the factor of 'service,' which is the traditional store habit, can sap the black ink out of the lifestream of net profit, and may well be obsolete. The acceptance of self-service and the supermarket by the public is a clear signal that all department stores had better re-evaluate their ideas . . . and roll with the punch," says Jack L. Straus, president of R. H. Macy & Co., Inc.

In rolling with the punch, many manufacturers of merchandise sold through department stores are realizing that the burden of selling is shifting from the sales clerk to the package. Some manufacturers, like Normandin Bros. Co. of Los Angeles, are far ahead of the field. Normandin Bros. have been packaging their "Hollywood Showerobes" in Du Pont cellophane since 1938 and sales have been rising steadily.

Textile manufacturers are finding, too, that packaging keeps merchandise clean, and this protection against dust, dirt and soilage helps reduce one of the largest cost factors in store operations—markdowns. A package that provides protection and visibility of product, they are finding, has great customer appeal.

SANITATION AN ADDED BLESSING

Sanitation afforded by transparent packaging is another sales appeal, particularly in infants' wear. Mothers do not want baby clothing that has been handled. Sweaters, buntings, diapers and blankets, neatly packaged, are as clean as when they left the

manufacturer. The problem of losing mates or parts of ensembles is also eliminated.

Both the customer and sales clerk like the convenience and speed in shopping brought about by packaging. The average customer doesn't need to open the package; brand advertising and the excellent job done in self-service supermarkets have given him confidence that the contents of the package will be uniform in weight, size and quality.

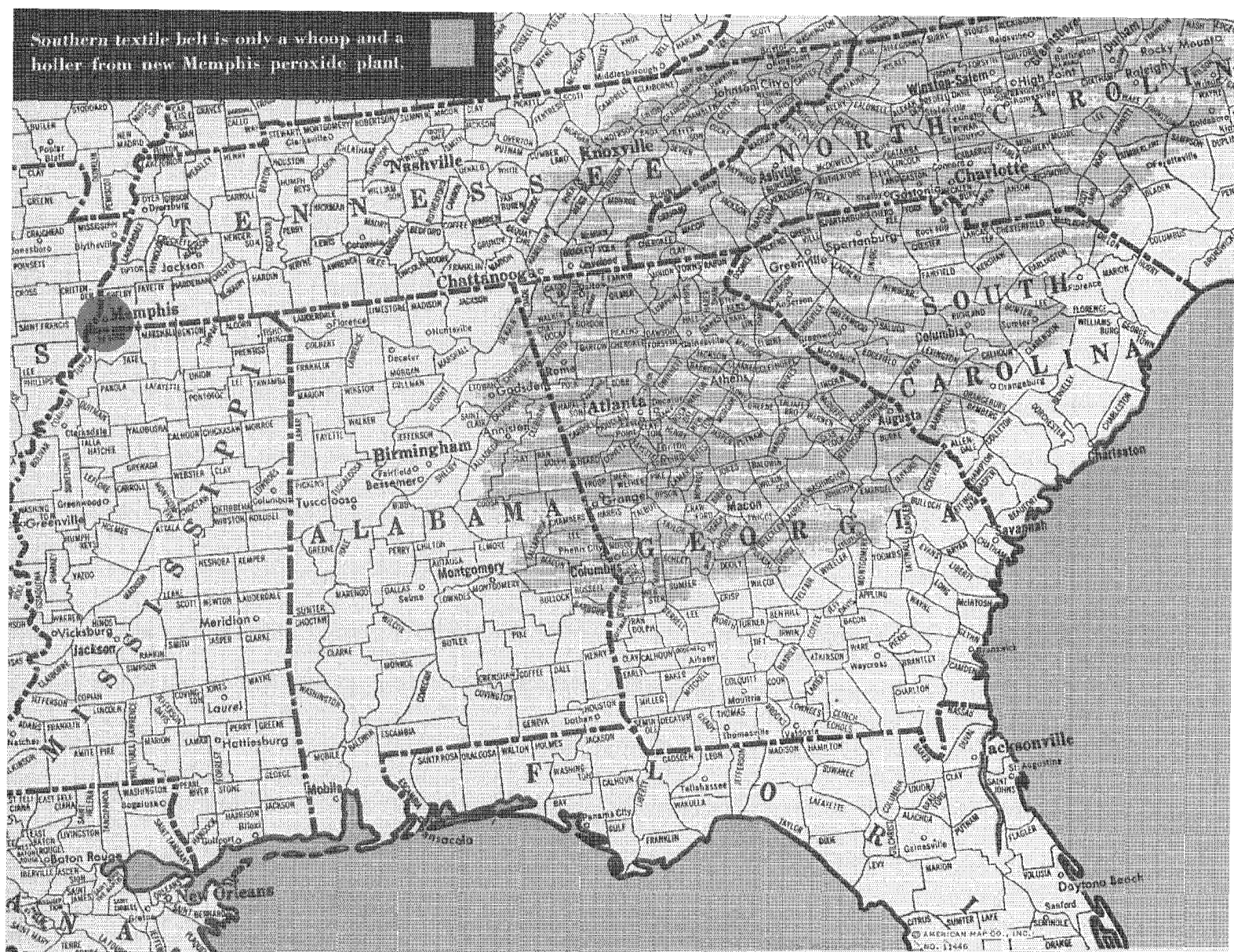
When information on material, size and laundering is printed clearly on the package, the customer reads the information without a sales talk from the clerk. If the brand name is not known, the package helps establish it in the customer's mind.

In buying textiles, the feel of material in shirts, pajamas and socks is important to many purchasers, so shops can offer self-selection from unwrapped samples of the garments on display. The customer chooses what he wants from the counter, then the salesman picks up the packaged garment in the proper size and design, and the sale is completed.

Du Pont polyethylene film is proving itself to be the best packaging material for large, bulky items. Manufacturers are finding Du Pont cellophane ideal for packaging lighter textile items with fast turnover. Whether it's gardening gloves, diapers, or high fashion lingerie, sales have proved a transparent package will win an approving nod from the customer—a nod that quickly says "I'll take this."



Southern textile belt is only a whoop and a holler from new Memphis peroxide plant.



More peroxide from less power

Du Pont's new non-electrolytic process for hydrogen peroxide manufacture is unveiled in Dixie

By HOWARD S. KARNES

MEMPHIS, TENN.

One morning several weeks ago a railroad tank car bearing the Du Pont oval rolled out of this Mississippi River city, bound for a textile bleachery in Griffin, Ga. As it rocked along on the 70-hour journey to Griffin, the car was chalking up two significant firsts:

It carried the first hydrogen peroxide ever manufactured in the South and the first shipment of peroxide from a new plant built by Du Pont's Electrochemicals Dept. near Memphis.

In the past the Company has shipped the chemical

from plants in Niagara Falls and Dresden, N. Y. to Southern mills, where peroxide is used in about 85 per cent of all cotton goods bleaching. Now, the completion of this new plant in the Mid-South lops a week or more off the delivery time to customers in the textile belt east of here. It means also that pulp mills and furniture factories in the area will get quicker delivery on peroxide for bleaching.

A uniform, permanent bleach for textiles and wood products, Du Pont "Albone" hydrogen peroxide is also used in bleaching oils, fats and waxes, as a

blowing agent for sponge rubber, and for the synthesis of many organic and inorganic compounds. High purity syntheses are possible since the only by-products from a hydrogen peroxide reaction are water and oxygen. "Albone" is sold commercially in 35 per cent and 50 per cent concentrations.

The industrial South might still lack a peroxide plant if it were not for a new non-electrolytic manufacturing process, resulting from more than eight years of research in Du Pont's Niagara Falls laboratories. The Company's northern peroxide plants require large amounts of electric power to electrolyze sulfuric acid for hydrogen peroxide production. The Memphis plant employs a catalytic process starting with readily available raw materials. The new method ends the heavy dependence on electric power, and it may also prove to be more economical.

The manufacture of "Albone" at Memphis follows by about nine months the launching of sodium cyanide production at the same location. Sodium cyanide, like hydrogen peroxide a basic chemical used widely in industry, is also a raw material in making one of the intermediates for nylon.

Du Pont's new multi-million dollar plant rises skeleton-like on a 225-acre former plantation about ten miles north of the Memphis business district. It's of the modern, open-air type, and most of the equipment is operated from controls located in small concrete

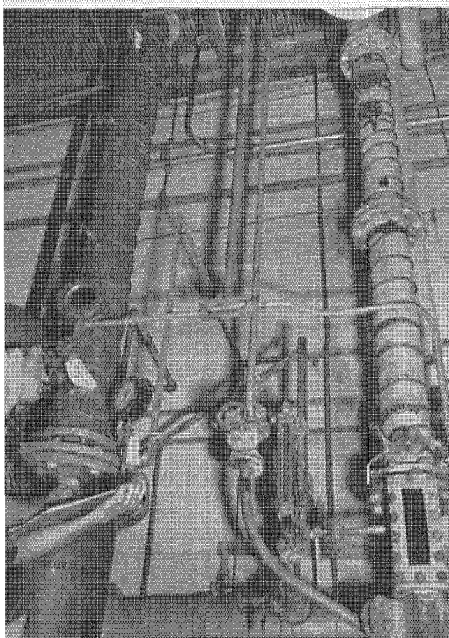
block buildings. Splashes of color identify the pipelines that circulate a variety of liquids and gases, the plant's lifeblood.

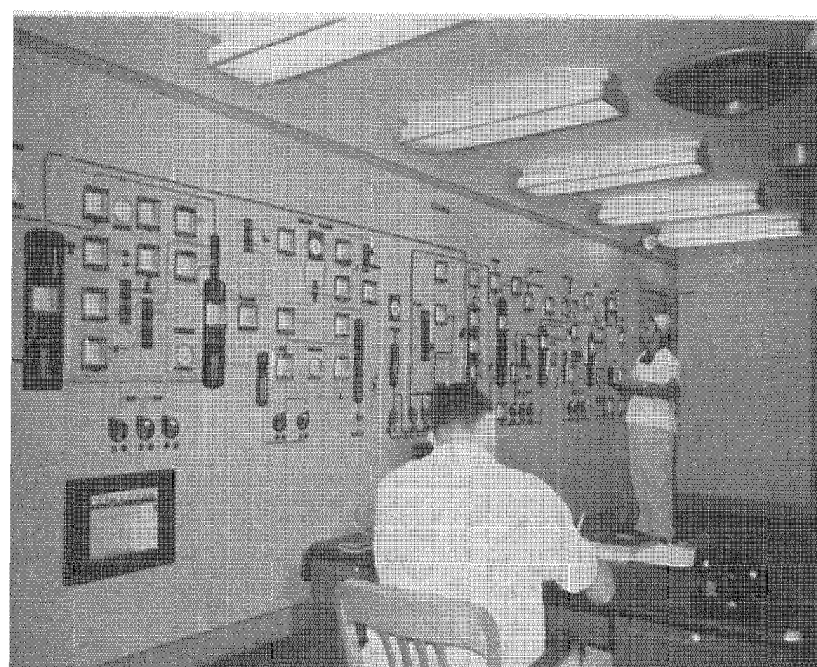
Three thousand gallons of water a minute are pumped from deep wells into the plant. A like amount of liquid is discharged into the Loosahatchie River, a Mississippi tributary. As with all new Du Pont building projects, adequate treatment facilities for wastes were an absolute must. A half-million dollars was spent on three huge retention basins and associated chemical equipment for rendering the waste innocuous before discharge into the river. While the plant was still in the planning stage, a team of six scientists was hired by the Company to make a thorough biological survey of the Loosahatchie River. The survey provides a standard against which plant personnel can check their findings in periodic inspections of the stream.

In avoiding pollution the Company is practicing a good neighbor policy typical of progressive industry. But not every strain on neighborliness can be foreseen. After the plant began operation, we were told, the scream of air from discharge valves brought complaints from householders as far as a mile away. The plant installed silencers on the valves, and now the Tennessee countryside is peaceful once more.

The Du Pont Company is no newcomer to this busy capital of the Mid-South, which boasts a population of 430,000, more than 800 manufacturing plants

BIG SCALE-UP speeded construction of the hydrogen peroxide unit at Du Pont's Memphis plant. The pilot plant below served as model for the full-scale plant at right. Note how miniature columns in pilot plant have become sizable towers in final construction.





From this panel, operators keep tab on hydrogen cyanide process. A high degree of instrumentation typifies plant.



Aluminum drums are filled with "Albone", after first being scrubbed. Impurities cause decomposition of peroxide.

and a volume of wholesale business greater than that of any other Southern city. The Company built and operated a smokeless powder and TNT plant here for the British during World War II. Later the U. S. Government took it over, naming it the Chickasaw Ordnance Works. Du Pont operated the plant until it was closed in 1945.

Tom D. Bell, manager of the new plant, says relations with the Memphis community are "the best I've ever seen anywhere." Charlie Pope, the personnel supervisor, adds "we've got as good a working force as you'll find in the country. They're young, hard workers; everyone wants to be a vice president, and that's the way we like it."

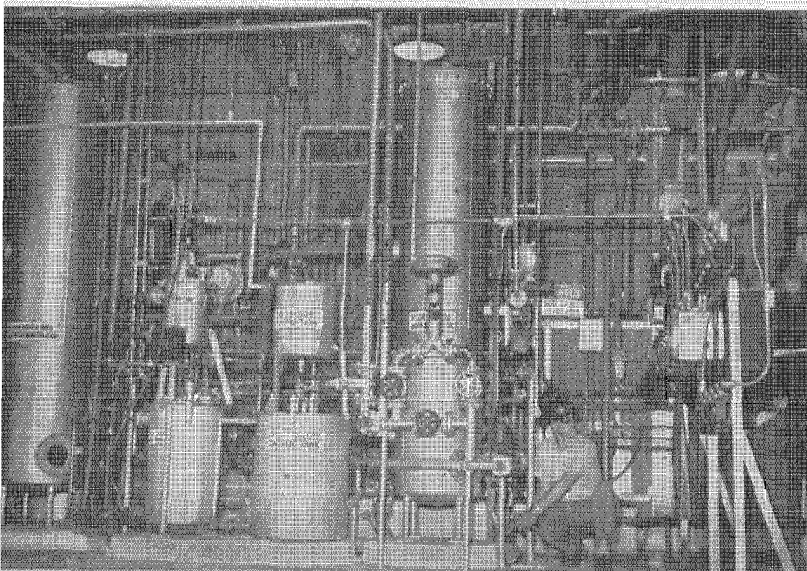
Clifford Penland, executive vice president of the Memphis Chamber of Commerce, says the business community is "proud" to have Du Pont in town. A

reporter for *The Commercial Appeal* uses the same word in describing the city's reaction to the Du Pont decision to build here.

In the 19 months it took to build the plant, almost \$5,000,000 in wages was paid out to construction workers. Wages and salaries on the plant totaled more than a million dollars during the first half of this year. And during the same six months the Company spent more than a quarter of a million dollars on purchases from Memphis business firms.

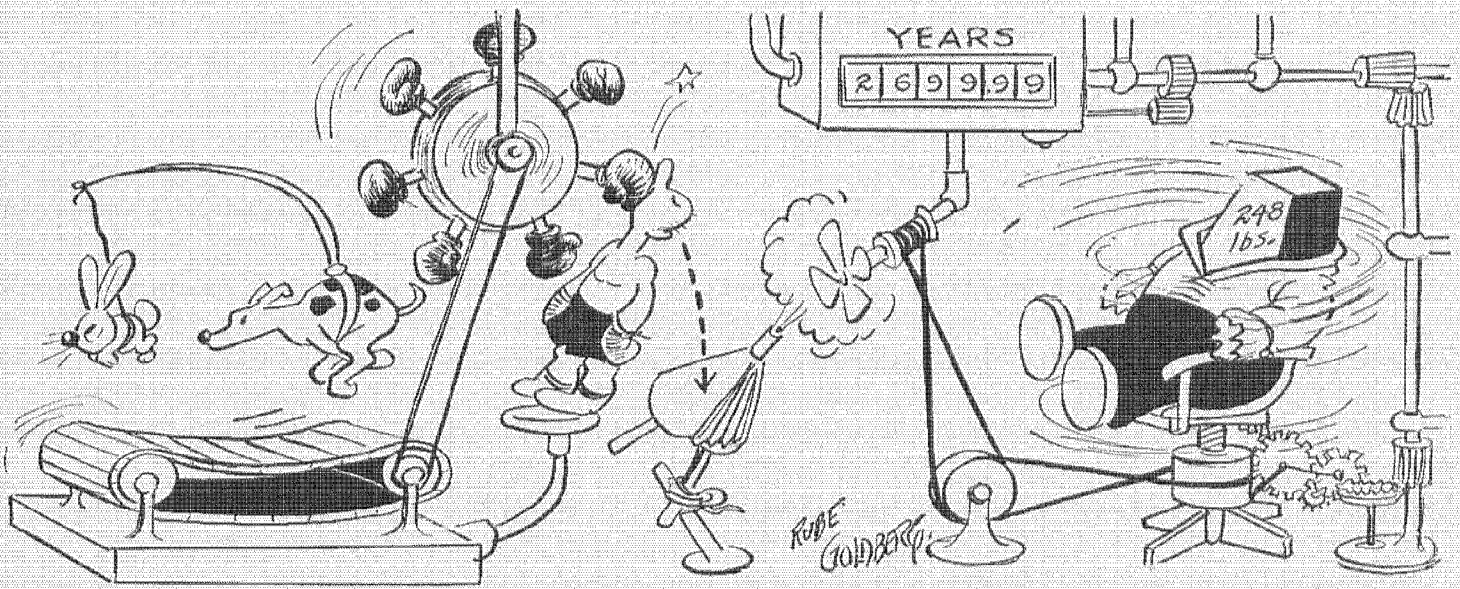
An economic boost for Memphis, a new and important industrial product for the South as a whole, a nearby source of supply for one of Southern industry's essential chemicals—all these stem from Du Pont's decision to build in Memphis, a decision made possible by the research that led to a practical non-electrolytic process for peroxide.

Water used in hydrogen peroxide manufacture is purified. The mixed bed demineralizer shown here removes the salts.



Plant's liquid waste is treated to avoid polluting stream. Sample being taken here is check on treatment's efficiency.





They tried to swivel it to death

A man's best friend in the office—besides his secretary, of course—is a swivel chair that will take his leaning, feet propping, turning and spinning without complaint. Put finally its heart, the swivel mechanism, gives out and the chair is sent to the shop or salvage, and the man is never the same again.

At least this used to be the story. Now the Sturgis Posture Chair Co. of Sturgis, Mich. has written a new ending to the saga of the chair, and even the constant swiveler can rest assured the mechanism that keeps him turning will actually last longer than the chair.

The new story goes like this. Engineers at Sturgis knew the only trouble spot on their steel chairs was the thrust bearing in the swivel mechanism. So they set out to test every available material to see if they could find one that resisted abrasion yet was resilient and quiet in operation. For each group of tests they loaded a chair with 248 pounds of substitute human being, started it turning and kept frequent checks on the performance of the bearing.

Results? The ordinary hard metal thrust washer wore out rapidly and was discarded. An oil impregnated, powdered metal alloy bearing lasted about 331,000 cycles in the heavily loaded chair. Then they tried a bearing of molded Du Pont nylon. After 1,550,000 cycles the bearing was still almost perfect; it showed only .004 inch loss by wear. It never squeaked, chipped or cracked . . . and all this without lubrication.

"The interesting part," says J. L. Mann, president of Sturgis, "is that the engineers, in testing the chair,

wore out the bearings in the testing machine. When we found that the wearing qualities of nylon were superior to anything else we tested, we not only put nylon bearings on all our office chairs, but in the testing machine as well."

Equally as satisfactory has been the experience of the Weather Check Window Co. of Garwood, N. J., makers of combination storm windows and screens. Each of their triple track windows requires 12 runners, and therein lay their troubles. The conventional spring-clips were not compatible with the extruded aluminum window frame. Contact with the softer aluminum caused galling. Besides, the runners were scratchy and noisy.

Weather Check engineers wanted to find a more suitable material and decided to try runners of molded Du Pont nylon. They rigged up a window to an electric motor which opened and closed the window 30 times a minute. After the window had traveled up and down more than a million times, the engineers put up their record books. Based on an average of opening and closing a window once a day, the runners of Du Pont nylon would last 2,700 years.

Tests proved the nylon runners not only had excellent resistance to wear but also were economical and showed no galling or binding, no deterioration from weather, no need for lubrication and provided quiet, effortless operation. Tests completed, the Weather Check Co. promptly changed to nylon. They can't wear out the stuff!



Big catch for Nova Scotia

*An on-the-spot report on Du Pont nylon for commercial fishing
in Canada's Maritime Provinces*

By JAY H. MACKEY

LUNenburg, NOVA SCOTIA

The seas were running stronger as the hurricane swung toward Brown's Bank, and the fishing fleet bounced and tossed. Aboard the vessel of Delmar Jones and Charles Nickerson, men worked furiously to pull in their trawl line—a quarter-inch fishing line with short, smaller sized connecting lines called gangings to which the baited hooks were tied. Somehow it had fouled on the bottom 225 fathoms down, and minutes of futile tugging had dragged

on into hours. Then, with the barometer dropping as fast as the storm was rising, the fishermen cut the nylon line and raced for Nova Scotia. The time was early September of 1952.

Jones and Nickerson returned to the waters off Brown's Bank again this year to fish for cod, haddock and halibut. Three months ago, they caught something else as well. The fishermen snagged the line they had cut free the year before and pulled it in. The smaller hemp ganging lines had rotted away, but the nylon trawl line was apparently unaffected by the months in salt water. It was promptly

refitted with gangings and hooks and put back into service.

Morrel Rogerson of Port LaTour, known up and down the coast as the exuberant "Bubbles," is a pioneer among Canadian long-liner captains using deep-water nylon trawl lines. "Soon after we got our first nylon line from F. C. Robbins Import of Yarmouth, we found how tough it really was," he said. "It used to be when we got \$3,000 worth of fish hooked, we got indigestion babying a line that might break under the strain any minute. So we had to pull it in slowly, slacking whenever we rose on a swell. With nylon, it's different. We learned it's strong enough to stand the strain, so we just winch it in.

"THAT NYLON SPIT WATER AT US"

"One day this year," Bubbles continued, "we had a good 2,000 pounds of halibut on our quarter-inch trawl, and then the lower end wrapped around something on the bottom. We gunned our 160 horsepower diesel up to 1,000 revs and yanked that line right out of there. Bent our inch-and-a-half iron dummy roller six inches—the line goes over it when being hauled into the boat—but all that Du Pont nylon did was spit water at us. We've used that line a full year now, and it fishes as good as new."

Despite the relative newness of nylon line and nets in Canada's Maritime Provinces, such reports are already well known. When glowing accounts of nylon's acceptance first reached us, we felt a personal check-up was warranted. With officials of Brownell and Co., Moodus, Conn.—a firm that twists fishing twine and lines from Du Pont nylon fiber and supplies them to Canadian importers—this writer attended the Nova Scotia Fisheries Exhibition in Lunenburg to question the fishermen on what they had found out about nylon.

The stories of the long-liners are backed up by Nova Scotia's lobstermen. They, too, told us that twine and rope of nylon keep their great strength far longer than natural fibers, are more resistant to abrasion and shock than any fiber on the market, and absorb little water, thus staying

lighter than other types. Historically, fishermen have always had to dry their nets and lines before they could be stored. The alternative was rot, mildew, or marine degradation. Nylon ropes, lines and netting, however, need no drying, and can be stored as wet as when pulled from the water.

The experiences of Dewey Nickerson of Clark's Harbor are typical of those who have used nylon for the net-like heads of lobster traps. He says: "As long as four or five years ago, I knitted nylon twine heads for some of my traps. I figure I'm doing real good to get two years out of heads made from natural fiber before they rot. Counting out the traps that storms steal from me each lobster season, I still have some with nylon twine heads that have been used for three years. The traps are worn out, but I'll put the nylon heads into new traps and use them all over again. This spring I plan to set 500 lobster traps off Sea Island, and they'll all have nylon in both the inner and outer heads."

Officials of the Canadian Department of Fisheries attending the exhibition could not, of course, endorse any product, or allow themselves to be quoted because of their official positions. But informal comments of some of these officials about nylon twine for lobster traps could be summed up like this:

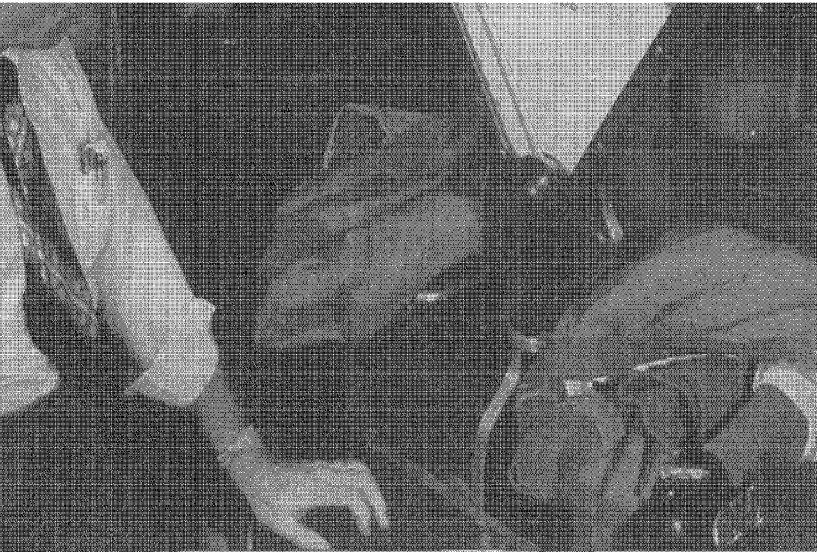
"Give us good markets for lobsters, particularly in the States, and our lobstermen will likely realize that the higher initial price for nylon header twine is a smart investment. Because of its strength, a smaller cord can be used and more heads made from a pound of nylon yarn. The longer life of nylon can be a real time and work saver because nylon heads need less replacement."

Concerning the use of nylon trawl lines by the rugged long-liners:

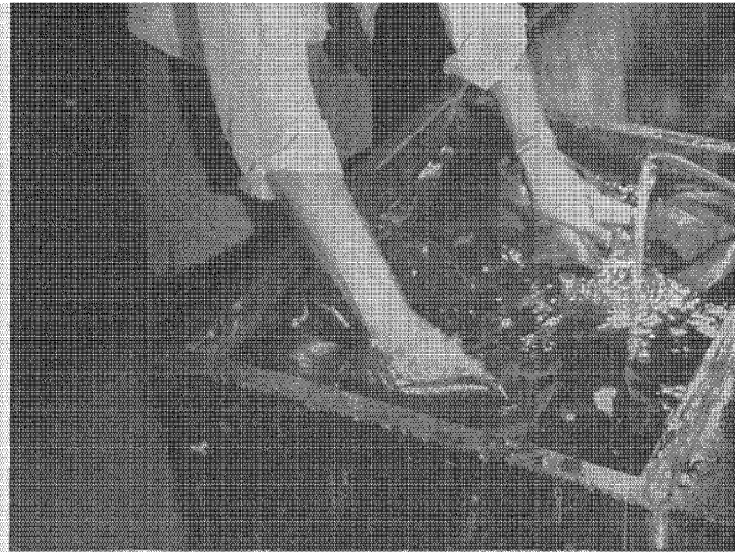
"If the economies of the world fish market are right, the majority of our fishermen will probably switch to nylon for heavy fishing within the next two or three years. It would seem the logical thing to expect."

Canada's lobstermen told us nylon twine head often outlasted rest of lobster trap.





Two suede leather jackets, one treated with "Quilon" and the other finished conventionally, weigh the same as demonstration begins.



Next step is to immerse both jackets in ordinary tap water for five minutes. Jacket treated with "Quilon" should pick up less.

A drenching and a hard-to-convince golfer in a dripping jacket are part of the saga of . . .

Du Pont's newest water repellent

By R. J. WOODRUFF, JR.

As we reconstruct the scene, there was a handful of die-hard golfers on the links that drenched and soggy afternoon last spring—and one guy who had to be shown.

This fellow was wearing a new suede leather jacket in the pouring rain. It looked like a dumb thing to do, but it turned out later that he is sort of the hero of the piece in spite of it. How was anyone to know there was more here than met the eye?

Well, they holed out on the 18th, and slopped into the clubhouse and peeled down. Everyone was soaked to the skin except the fellow in the suede jacket, who was dry as a duck underneath the jacket. Before joining the others in the shower room, he blotted the wet coat with a handful of paper towels as though it were platinum mink.

Soon it was clear that something was happening in the locker room that had nothing to do with par or birdies. In a matter of minutes the jacket, which normally would have been a soaked, heavy mess of leather you'd feel like throwing back over the fence to the sheep, was drying as you watched. Actually, only the

surface had been wet. The leather was still soft and pliable and the color was coming back—no streaks, no dark patches.

It was and it wasn't a miracle, depending on how you look at it. Sure, the total effect, giving suede lasting water-shedding properties, is a miracle. But it is a calculated miracle, and the golfer in the suede jacket knew what to expect.

The chemical that brought it off, a Du Pont water repellent called "Quilon" stearato chromic chloride, is quite something itself. For it is a water-soluble water repellent. It has the additional property of permanency; that is, it won't wash or dry-clean out. When you line these ducks in a row you have the answer to many of the dreams of the textile, paper, felt and leather industries.

The gentleman who ignored his own health on the links that rainy day last March now sits at his desk in Wilmington happily soaking suede swatches, some treated with "Quilon" and others not, to show the advanced state at which suede sheepskin has finally arrived after all these years.



It does . . . three pints less. Merely wet on surface, treated suede dried quickly, remained supple. Other coat grew stiff.

Early tests were run at the old tannery firm of John Flynn and Sons, of Salem, Mass., and this new application of "Quilon" now has been called to the attention of the suede leather industry in general. There appear to be few, if any, processing problems with the chemical. A water solution of the greenish-blue liquid is applied in the dye processing step in place of the fat liquors normally used.

Du Pont men working in the tannery at Salem explained the reaction of "Quilon" with leather. The chromium part of the "Quilon" molecule anchors firmly to the surface of the leather fibrils, while the stearate group acts as a water repellent and fiber lubricant. The treatment also seems to improve the fastness of dyes to dry cleaning, which is important to the garment industry.

Dry cleaning of suede garments has long been considered a ticklish art, and few cleaners would undertake it. But now garments treated with "Quilon" can be dry-cleaned by standard methods without losing color or softness. In addition, treatment with "Quilon" gives suede stain resistance, thus reducing the soiling problem.

PASSES RAIN TEST EASILY

Du Pont technicians have given leather swatches treated with "Quilon" rough treatment under standardized rain tests. In these, a needle spray under heavy pressure blasts at the swatch while other instruments compute the time it takes water to soak through. Untreated swatches, and those treated with conventional wax-type repellents, have stood the gaff for varying periods up to 30 seconds. Swatches treated with "Quilon" lasted a minimum of 30 minutes.

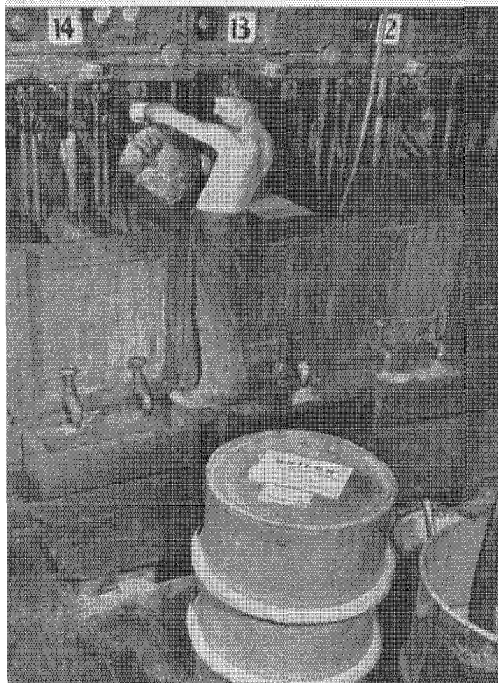
Du Pont chemists first came upon the water-repellent properties of "Quilon" in the course of research with paper finishes just at the start of World War II. It wasn't until 1946, however, that it was made available to industry. By 1949 the paper industry was using it in quantity to make water-resistant and nonsticky paper for meat wrapping, ice cube bags, outdoor signs, and even for use in the building trades.

About half of the fur felt hats made in the country today are treated with "Quilon" for water repellency. Leading hat makers have established for themselves that a treated hat picks up a relatively small percentage of water, even in a downpour.

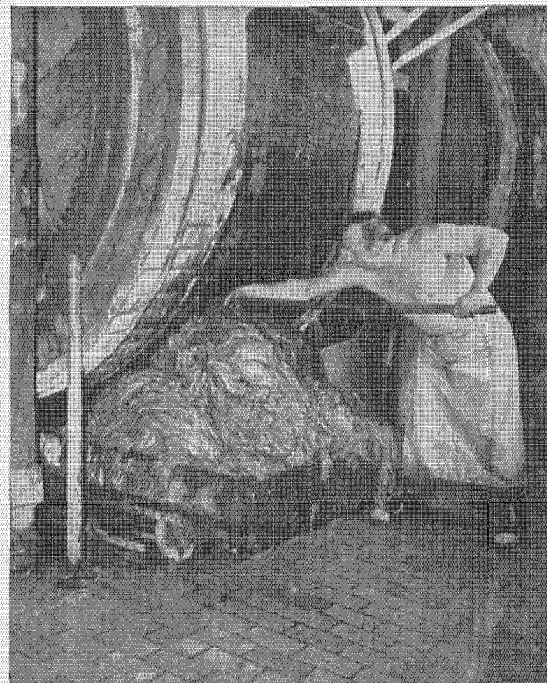
Elsewhere in the apparel field, the chemical also is exciting interest. There is even talk of using Du Pont's new water repellent on the uppers, and in some cases the soles, of heavy-duty Army shoes, golf shoes, hunting boots and similar outdoor footwear.

As you see, "Quilon" is getting set to cover the subject from top to toe.

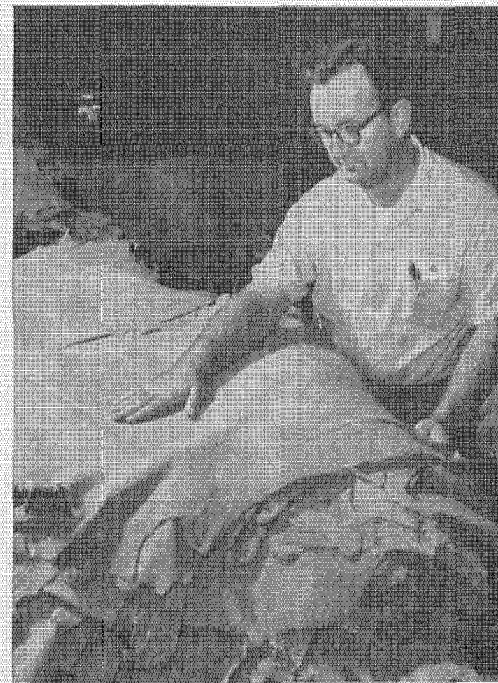
"Quilon" is economical to use. Three pails of the chemical will treat 420 sheepskins.



Pulling treated skins from drum. Tanning is an ancient trade, as this photo suggests.



Suede skins are graded at John Flynn & Son, Salem. This firm aided in development work.



One enthusiastic printer calls the new Du Pont Screen Process Film . . .

“A dream come true”

By FRED J. COWAN

Have you ever wondered how giant billboard posters are printed or how colorful designs are applied directly on glass bottles? Often they are stenciled by screen printing, the most versatile of the reproduction processes. Soon, with the aid of a revolutionary new product, Du Pont Screen Process Film, you'll see more of this colorful lettering and art on objects of all shapes and sizes.

Screen process printing is a highly refined version of the stencil method used to label shipping cartons. Paints or inks are squeegeed through tiny openings in a stencil onto the object to be printed. In addition to bottles and billboards, screen process printing is used on colorful show cards and textiles, metallic objects such as airplane wings

and truck bodies, and almost any other surface on which you may want to imprint a message.

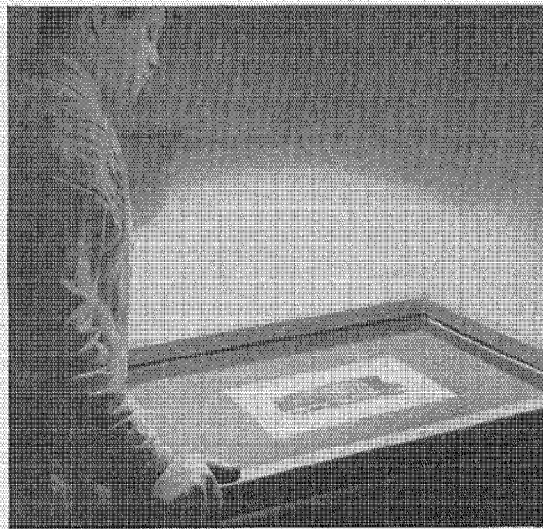
In the past, screen process printing has often been slowed by the intermediate steps in making a finished stencil from art work. Now, Du Pont Screen Process Film, using a photographic technique, dramatically reduces the number of steps required and makes screen printing more versatile than ever.

Here's how it works. Say you have an idea for a Christmas card and a friend who is artistic enough to draw it for you. Your local screen printing shop can reproduce it in any and all of the colors you wish, on whatever paper you select, or even on cloth—those painted neckties you've

Small film positives such as lantern slides can be enlarged on new Screen Process Film.



A third method of exposing the film is by contact in a photographic printing frame.



Darkroom developing of Screen Process Film is easy and takes less than three minutes.



Developed film is sprayed with warm water. Unexposed, unhardened gelatin washes away.

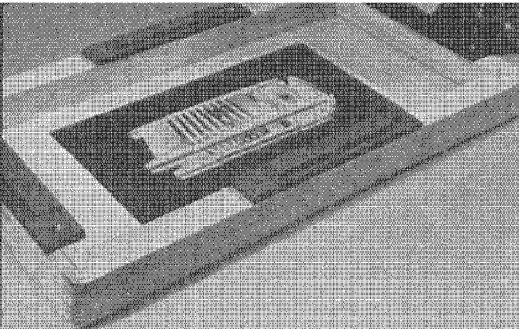


Printing screen made of fine mesh silk or metal is placed in contact with the film.

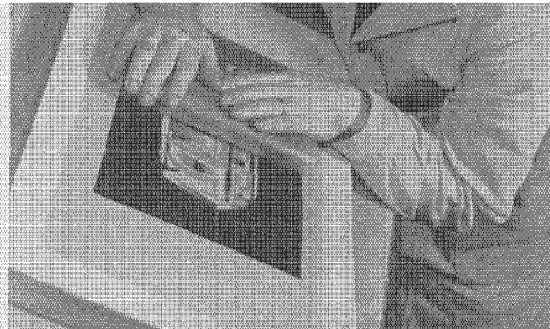


Excess water is absorbed by blotting paper. Pressure makes film adhere to screen. (Over)





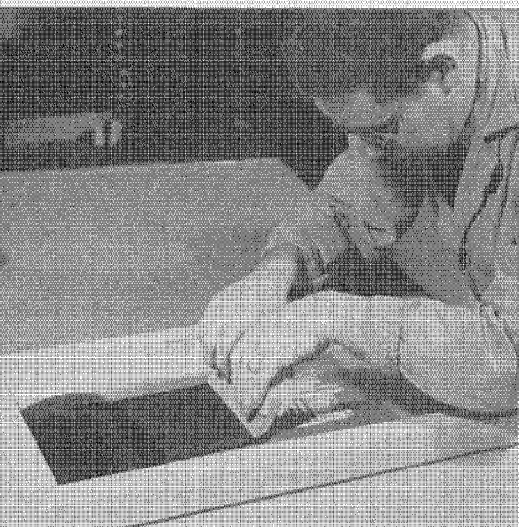
Screen Process Film, now on silk screen, dries in about 20 minutes when fan is used.



Vinyl base is dry-stripped from the film, leaving gelatin layer adhering to screen.



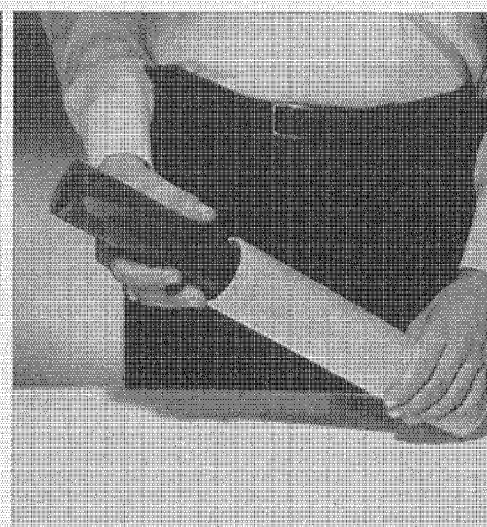
The screen ready for printing. Details are sharp and clean; stencil is long lasting.



A screen in use. Printing paint or ink is squeezed through open mesh of the stencil.



Variety of materials, such as paper, metal, textiles and glass, can be screen printed.



For distant printing, bulky screen need not be shipped. Developed film is sent instead.

seen were very likely screen printed. Your drawing is photographed on Du Pont Screen Process Film, enlarged or reduced, by the camera, to the desired size. The exposed film is developed in a darkroom for about three minutes. Then the film is sprayed with hot water, and a fascinating change takes place. The gelatin areas of the film exposed to light have been hardened by action of the developing chemicals. They adhere to the vinyl base, while the unexposed areas, still soft, are washed away.

PHOTOGRAPHIC IMAGE GOES ON SCREEN

The sheet of film is then pressed into contact with a piece of fine silk or metal mesh stretched tight over a wooden frame. When the film is dry the vinyl base is stripped off, leaving a thin but durable gelatin stencil on the silk or metal. The printer matches your color selection with paint or ink. A different stencil is used for each color, and the ink is forced through the stencils onto the paper by a rubber squeegee. Result: a beautiful card.

Any number of stencils can be printed on the same card to produce different colors in different areas, and the stencils are good for many thousands of impressions. This procedure we've just described is representative of screen process printing using the new Du Pont film in a camera. Instead of the camera, however, a projector may be used to make enlarged stencils directly on Screen Process Film. This is the usual practice, for example, in making large

outdoor posters. Stencils the same size as a transparent positive may be made, using conventional equipment such as contact printing frames.

One of the biggest advantages in the eyes of many screen process printers is that, unlike conventional materials, Screen Process Film can be exposed and developed, then held for application to the screen at a later date. Or it can be rolled up and shipped in a mailing tube for printing elsewhere. This is a new departure, since in the past the screen itself, stretched taut on a bulky frame, had to be wrapped and shipped.

Older materials require refrigerated storage, but this film can be stored and handled like any photographic film or paper. The film is physically tougher than the older materials, too, and needn't be handled with kid gloves.

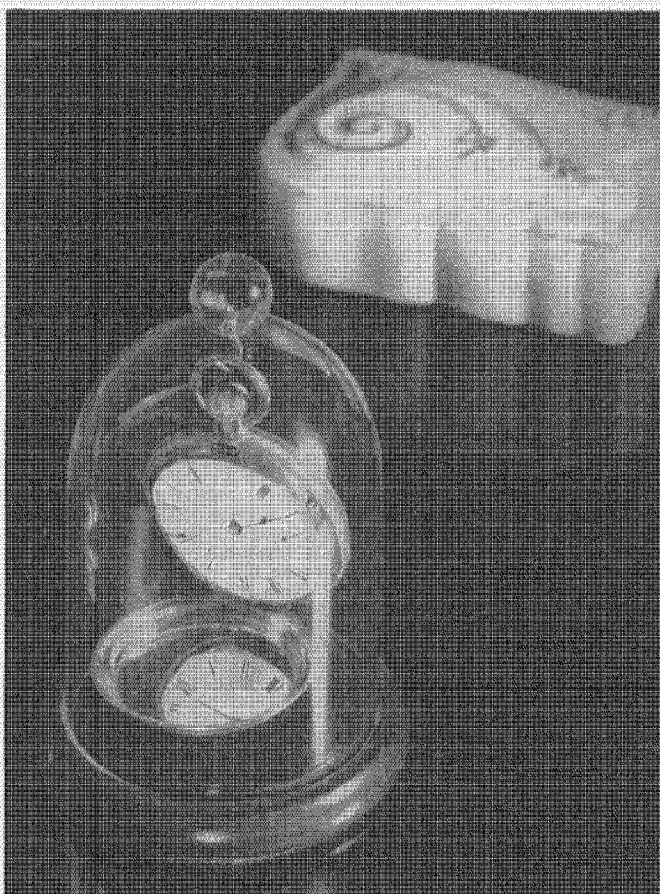
Announced a month ago at the Screen Process Printing Association convention, Du Pont's film is already seeing service in printing billboards, aerosol containers, glass bottles and jugs, Christmas cards, and advertising displays and exhibits. The film is expected to expand even farther the horizons of an already fast-growing industry.

Look at that cheese glass again. Does it suggest a use for a label that won't peel off? Is the need for a sign unaffected by rain and wind? An artistic pattern on cloth or pottery? Your screen process printer is the man to see. For technical data on processing the film, write this Magazine for a descriptive brochure.

What's New

• A NEW \$3,000,000 MINE and plant to produce ilmenite, the raw material for titanium metal and titanium pigments, will be constructed for the Company near Lawtey, Fla. Mining will be done by a dredge floating on a "traveling lake" dug in the ilmenite-sand deposit. Operations are scheduled to begin early in 1955.

• EXPLOSIVE RIVETS that are blast-free and practically noiseless are now on the market. When this new Du Pont rivet is expanded, no deformation appears on the opposite or adjacent structure, even when extremely close to the shop end of the rivet.



• A GIFT IDEA for friends who have an heirloom watch is this "Treasure Dome" molded of Du Pont "Lucite" acrylic resin. Crystal-clear "Lucite" is shatter-resistant and easy to keep clean. Made by the Carol Beatty Co., 635 S. Kenmore Ave., Los Angeles 5, Calif.



• CARBOY ON WHEELS. This new tank wagon, built to Du Pont specifications, was recently put in service at Grasselli, N. J. Its three glass-lined tanks hold 1,500 gallons, as much as carboys piled at left, and deliver acids that are of C. P. reagent grade. One large user estimates bulk delivery will save him as much as \$15,000 a year.

• A MOSQUITO-KILLING CHEMICAL now gives hope to areas where this disease carrier has become resistant to DDT and other insecticides. One ounce of the chemical, EPN-300 insecticide, will kill all the larvae in an acre of water-covered area. As a powerful new weapon against mosquitoes, it can be used only in diluted form against the wigglers and only by technicians trained in safe application of toxic materials.

• ALL-NYLON BED SHEETS, made by Pepperell Mfg. Co., are now on the market. The new sheets come in twin-bed and double-bed sizes and set a new standard for easy care, durability and long wear.

• TWO NEW TECHNICAL BOOKLETS on hydrogen peroxide are available. "Albone' Hydrogen Peroxide" describes properties, uses and applications of the product for the production manager or technical director. "Epoxidation and Hydroxylation with Organic Peroxides" is a guide for evaluating reactions of this type. For copies, write Electrochemicals Dept., N-11507-HP, Du Pont Company, Wilmington 98, Del.

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For additional information on products or services mentioned in this Magazine, write to James H. McCormick, Editor, Du Pont Magazine, Wilmington 98, Delaware.

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Chrysler Corp.; Page 30, top: Courtesy Byron Jackson Co.; Pages 32, 33 and 34, top: Courtesy Food Machinery and Chemical Corp.; Page 35: Courtesy The American Perfumer.



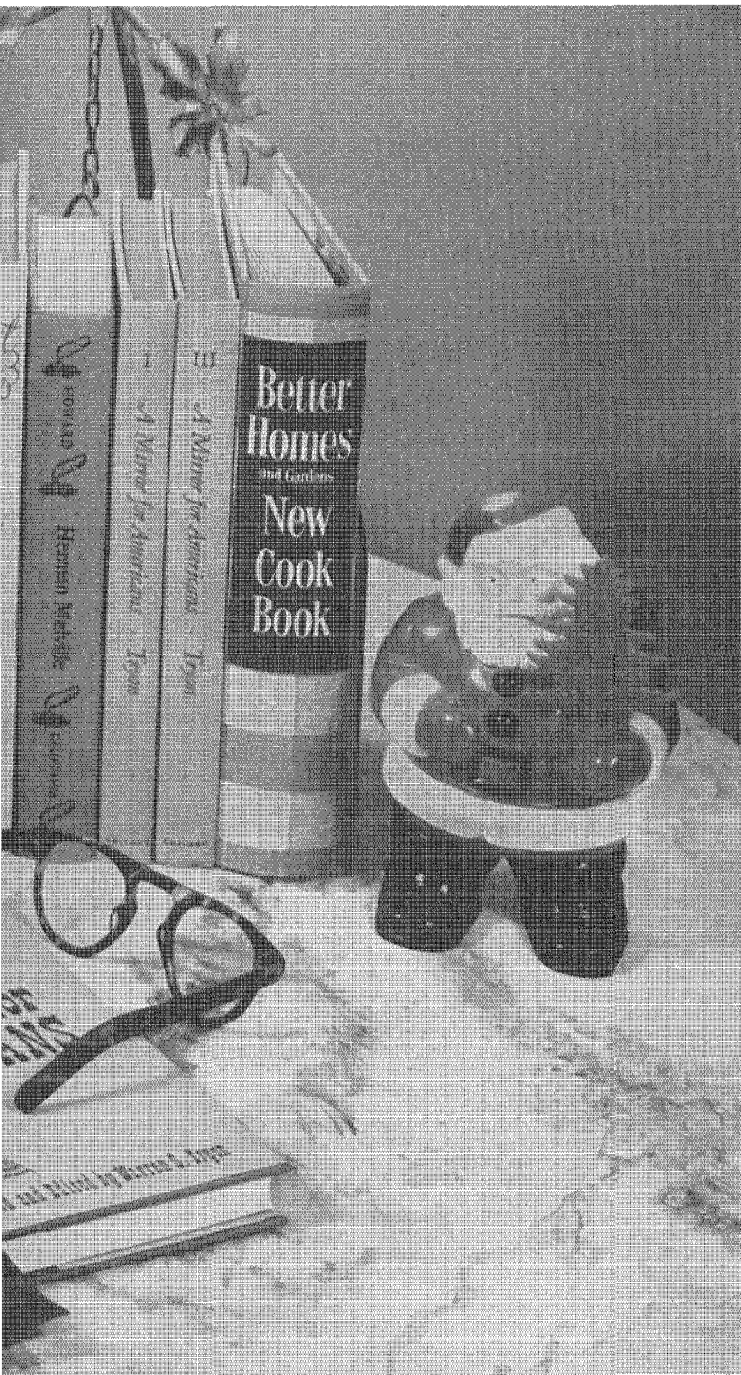
For lasting pleasure . . .

Give books this Christmas

Books make memorable gifts, ones that do honor to both giver and receiver. In their infinite variety can be found something to match the interests and needs of everyone on your Christmas list, and the fitness of a gift is half its charm. Good books are timeless companions, too, growing in value with the years.

The volumes reviewed here, along with others at your bookstore, should be examined with your Christmas list in mind. To complement their inner quality, each book is bound in either Du Pont "Fabrikoid" pyroxylin-coated bookbinding material or "PX" pyroxylin-impregnated book cloth for handsomeness and durability.

HOLY BIBLE. Pilgrim Edition. Oxford University Press, \$8. What more fitting Christmas gift for the young than this King James Bible with explanatory notes



especially adapted for young Christians? Contains 13 color plates showing the Holy Land, Solomon's Temple, etc. Bound in "Fabrikoid" and gold stamped.

History

A MIRROR FOR AMERICANS: Life and Manners in the United States 1790-1870, as Recorded by American Travelers; compiled and edited by Warren S. Tryon. Three volumes. University of Chicago Press, \$14.50 set. The young nation as seen by its traveling citizens. Fascinating first-hand glimpses of daily life often missing in more formal histories.

WAGON ROADS WEST, by W. Turrentine Jackson. University of California Press, \$5. The covered wagon, symbol of westward movement, needed trails on which to

travel. This is the story of the federal government's role in surveying and improving Western wagon roads in the years after the Mexican War. A segment of national history minutely explored.

SOLDIERS, INDIANS & SILVER, by Philip Wayne Powell. University of California Press, \$4.50. The evolution of Spain's colonial policy in North America. Touched off by a Mexican silver rush in 1546, a bloody Indian war eventually convinced Spanish policy makers that diplomacy and religion were more effective weapons than the sword.

Science

FOOD FOR LIFE, edited by Ralph W. Gerard. University of Chicago Press, \$4.75. Authorities on nutrition and metabolism pooled their efforts to produce this understandable account of what you eat and why. Intended as background to help you interpret the welter of information available today on such matters as diets and vitamins.

LIFE OF THE PAST, by George Gaylord Simpson. Yale University Press, \$4. An eminent paleontologist explains his science for the general reader. Paleontology, the science of reading the record of life, has made rapid progress in recent years. The author tells how fossils have increased our understanding of life and its evolution.

Reference

THE COLUMBIA-VIKING DESK ENCYCLOPEDIA. Viking Press, thumb-indexed, in gift box, \$12.50. Up-to-date coverage of science, the arts, and world affairs. Ideal for home, office and school. Deluxe edition covered with "Fabrikoid".

THORNDIKE BARNHART COMPREHENSIVE DESK DICTIONARY. Doubleday; flexible "Fabrikoid" cover thumb-indexed, \$3.95. More than 80,000 entries, 700 illustrations, notes on correct usage.

HAMMOND'S NATURE ENCYCLOPEDIA OF AMERICA. Classics Edition. C. S. Hammond & Co., \$25. Colorful (320 paintings, 104 maps) guide to the animal, vegetable and mineral kingdoms of the U. S.

... And Others

HERMAN MELVILLE, by Leon Howard. University of California Press, \$5. Biography of that "lively, unconventional man," the author of *Moby Dick*. A re-creation of the writer and his times.

AFTER THE HUNT, by Alfred Frankenstein, University of California Press, \$10. An art critic's sleuthing uncovers the story of William Harnett and other American still life painters of the period 1870-1900. Well illustrated, with colored frontispiece of title painting.

BOUQUET DE FRANCE; An Epicurean Tour of the French Provinces, by Samuel Chamberlain. Gourmet, \$10. Combined guidebook, restaurant directory and cookbook by a gourmet. Recipes range from Escargots Maison, as served in the town of Pont-de-Dore, to Poule au Pot Henri IV, specialty of a Paris restaurant. Mouthwatering.

BETTER HOMES AND GARDENS NEW COOK BOOK and HANDYMAN'S BOOK. \$3.95 each. Practical and welcome gifts for the newlyweds on your list, or the older friends who somehow overlooked these volumes.

INTERNATIONAL POSTAGE STAMP ALBUM, Part I. Scott Publications, \$10. For the collector. Covers 1840-1940, has more than 1,200 pages. Loose leaf, with cover of dark blue "Fabrikoid".



1,000 consecutive X's

*... spell out to the small-bore rifle competitor why this new match ammunition
is the hottest rifle news of the year*

By HENRY P. DAVIS

The small-bore rifle shooting competitor pursues a goal that may never be reached. He wants an ammunition that will land all of his bullets in the same hole in a target. A large order, but the sporting ammunition industry is nevertheless working toward that end.

It is this exacting ideal that lends great significance to the recent announcement by Remington Arms Co., Inc. of its new Remington Match and Peters Match ammunition for the rifle shooting fraternity. In a sustained firing test with these cartridges,

Remington technicians scored 1,000 consecutive X's—hit the bull's eye within a bull's eye 1,000 times in a row! Such sensational accuracy was unheard of, and it was by no means accomplished overnight. The new match 22s climax one of the most elaborate development operations in recent ammunition history.

HUNTER AND SHOOTING COMPETITOR DISAGREE

The regular 22 caliber long rifle ammunition has been famous for high accuracy for a long time, and is altogether satisfactory for the hunter. It is a mass production item that is clicked off the loading machines at Remington Arms' Bridgeport, Conn. plant at the rate of several millions of finished cartridges a day. Yet, although each is a precision instrument, the standard cartridge doesn't meet the standards of the serious-minded small-bore competitor. He has his heart—and eye—glued on the tiny white-rimmed "X ring" of the target. This is the gauge by which winners in rifle shooting matches are usually determined, for it is no departure from the usual for two or more shooters in a 22 caliber match to end up with perfect scores of 400 out of a possible 400. Even if shoot-offs were practical there would be no need to use this method in settling the issue, for the excellence of the individual's marksmanship is reflected in the number of X's—the number of bullets landing inside the X ring—that appear in his score. The 400 shooter with the greatest number of X's wins the match.

HITTING A 25-CENT PIECE 100 YARDS AWAY

There are seven rings on the official National Rifle Association 100-yard small-bore rifle target, decreasing in size as they increase in value. The five, six and seven rings, each counting for a corresponding number of points, are in the white portion of the target. The black bull's eye contains four rings, the eight, nine, ten and X rings. The ten ring is two inches in diam-

eter, and the X ring is only half as large. Picture shooting at a 25-cent piece 100 yards away, and you'll have some idea of the accuracy that must be built into bullets that will hit such a target with dependable consistency.

And it'll also give you some idea of why more than five years of experimental work went into just the bullet design of the new Remington and Peters Match ammunition. This design is a radical departure from the conventional. The shouldered profile was chosen only after it had proved its ability to give maximum accuracy. The bullet fits the rifling perfectly and delivers a uniform center of impact over a long series of shots.

70 ALLOYS TESTED

More than 70 different alloys were tested thoroughly before the final bullet composition was chosen. This alloy gives the bullet exceptional wind stability and hence provides greater accuracy. At the same time, the material reduces leading in the rifle barrel. The cartridge case also underwent complete revamping, from head to mouth. While, in the natural course of development, each new Remington product is put through the wringer in every practical manner, new and unusually exacting tests were devised for these cartridges, and the highest standards of performance were met.

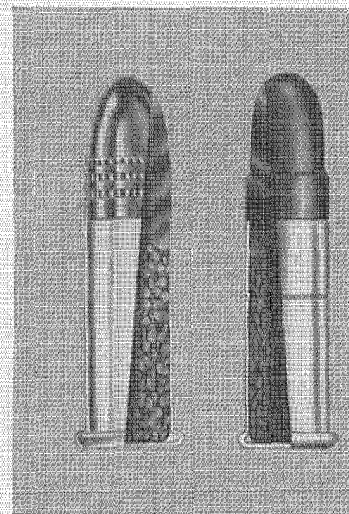
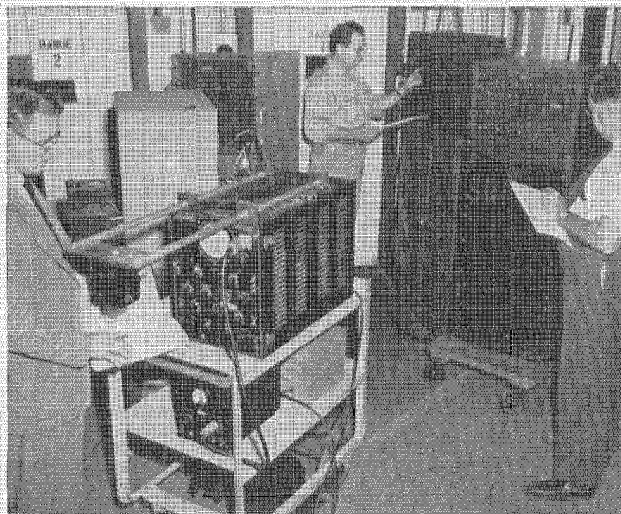
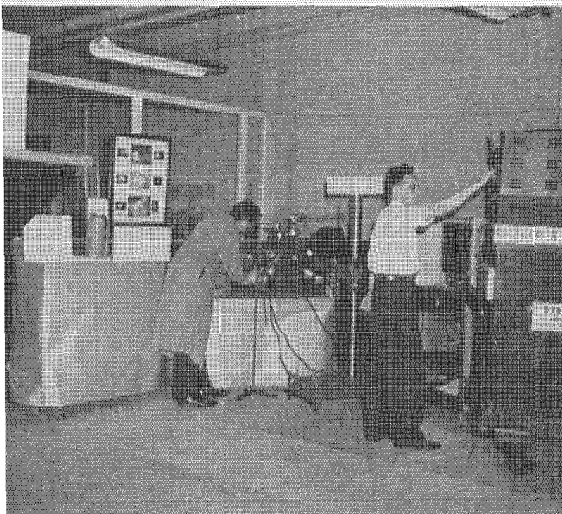
It is conservatively estimated that more than half a million cartridges were test fired before Remington's Research and Development Dept. was willing to place its stamp of approval on the new product.

Small-bore rifle shooters all over the country have acclaimed the new cartridge as a great step toward the ultimate in precision firing. Such approval from what is probably the hardest-to-please segment of the shooting sport is gratifying encouragement to Remington Arms' continuing research and development program.

Remington Arms' new 22 caliber match ammunition resulted from more than five years of research.

During its research and development stage, the new cartridges were subjected to daily tests.

Regular 22 cartridge (left). New match cartridge (rgt.).





Service with a smile brings 'em back again.

Why do you buy like you do?

Extensive Du Pont survey reveals what goes on in motorists' minds when they buy gasoline

By MARY ELLEN EVANS

If you are an average American, chances are you've read results of many surveys lately, or even been interviewed on any subject from sex to cigarettes. And as interesting as the findings may be as conversation pieces, each survey was made to get objective and useful information on the subject at hand.

Take the recent survey being completed by the Du Pont Petroleum Chemicals Division. Called "The Service Station and the Motorist," it is a study of the national buying habits of motorists at service stations. The survey was conducted as a company service to our tetraethyl lead customer, the petroleum industry, which provides you, the motorist, with the services and products you need.

Trained interviewers talked with 3,100 car owners at home. This household study provides a base for measuring what people *say* they do and why they do and think certain things when buying gasolines. Observers then made some 24,000 observations at 1,193 service stations—to see what motorists *actually* do when buying gasoline. Here are some of the chief findings of the interviewers. See how your buying habits stack up with the national average.

Q. When you buy gasoline around home, do you usually go to the same service station?

Two out of every three purchasers of gasoline said

"yes." Almost nine out of ten motorists have been going to their favorite station for more than a year; almost half for more than five years. And four out of five buy all or nearly all their gasoline there.



Trained interviewers asked buying preferences.

Q. How did you happen to start going to this station?

"It's located conveniently," said 4 out of 10 drivers. This usually meant within two miles of home. Next most frequent answer was that they knew the dealer and felt friendly toward him.

Q. Why do you usually buy at that particular station?

Motorists continue to stop at their favorite station, they say, because they like the service. Close behind this answer are "convenient location," "like the dealer," and "brand of gasoline." The higher the income of the driver, the more he stresses service.

Q. When on a trip, what things do you consider in deciding where to stop and buy gasoline?

Travelers said they look first for clean stations and then for particular brands of gasoline. Station appearance proved to be of more importance to women than it is to men. Brand was next in importance for both.

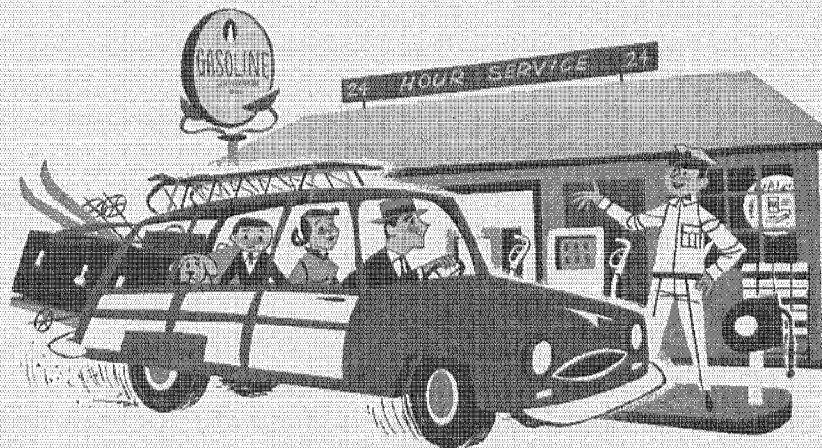
Q. If your station changed and sold a different company's gasoline, would you continue to go to the same station?

One half of those asked said they would remain loyal to the station even though the brand were changed. They said they would stick with the station because of service, dealer friendship and convenience. Those who said they would change stations if the brand were changed would leave because they are loyal to brand. Even among those who do not buy all their gasoline at one station, 37 per cent are loyal to one brand.

Most motorists, the survey shows, have a preferred brand. Two out of three say they buy one brand exclusively. In other words, at the station, gasoline is bought, not sold. It is brand acceptance that is sold, before they drive in. And selection of brand is based on belief in quality. Gasoline grade names are seldom recalled; it is the sign identifying the station that is remembered.

Q. What grade of gasoline do you usually buy?

Premium grade is preferred in the West; regular leads in the Central States and in the U. S. as a whole. Those who buy regular say price is the largest consideration. A dealer's best prospect for sale of premium is to



Cleanliness is stopper for travelers.

motorists with higher incomes and with newer or higher priced automobiles.

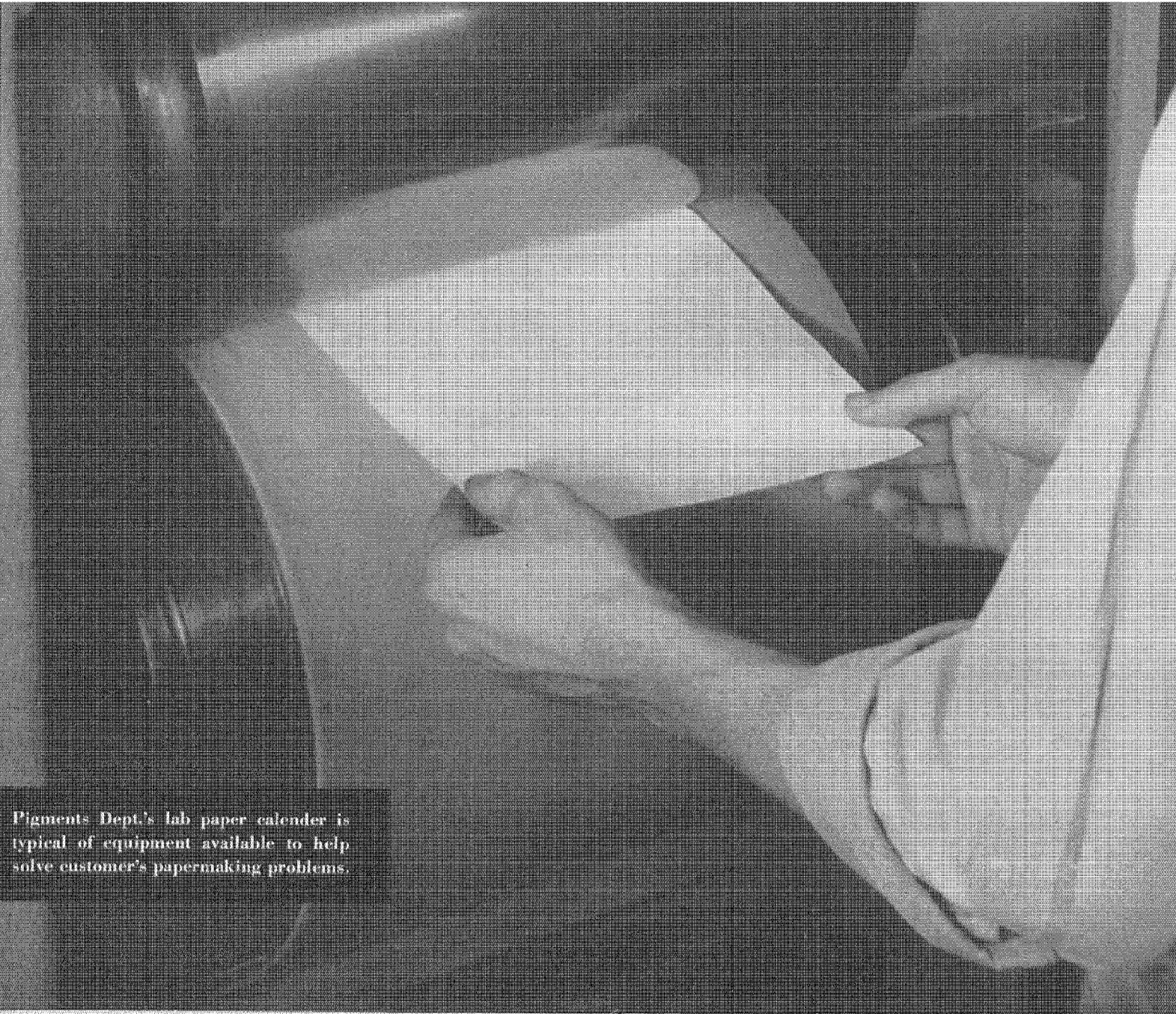
Consumers show good knowledge of current gasoline prices. Few recalled price wars; fewer changed their buying habits because of price cutting. Nationally, 12 per cent of motorists hold credit cards; 30 per cent in the West. Credit card use increases rapidly with income; in most cases credit card holders are best customers.

The survey, being published in six parts, documents the purchase patterns, attitudes and trends on the part of service station customers in four major marketing areas. The findings are analyzed and compared on the basis of Northeast, South, Central and West and by sex, income and age. Service station observations are analyzed by age and price of car. The area sampling method, employed by the Bureau of Census and other agencies as the most accurate technique devised, was used throughout the survey.

As they are printed, reports are being sent by our Petroleum Chemicals Division to members of marketing divisions of petroleum companies. These marketing experts are using the findings in their plans to meet consumer demands. Through charts and booklets, they are showing service station operators what they can do to serve the motorist better. Thus Du Pont service to a customer industry aids the American consumer.

Sloppy, dirty stations don't catch the traveler's cash.





Pigments Dept.'s lab paper calender is typical of equipment available to help solve customer's papermaking problems.

Whitening paper's face

...is the task of "Ti-Pure" titanium dioxide pigment. After January 1, it will be sold direct to papermakers by Du Pont Pigments Dept. salesmen

By HAROLD C. BRILL and JAMES MACK

Mills using white titanium dioxide pigment to add opacity and brightness to their papers soon will be contacted and serviced directly by Du Pont personnel. As part of this transfer from an outside selling agency

to Du Pont's own selling force, trained Pigments Dept. salesmen will start calling on papermakers after the first of January, and a technical sales section and paper laboratory at Newport, Del. will be ready to

help customers make white paper of all kinds.

The new service laboratory will work directly on customers' paper problems relating to white pigments, such as opacity and brightness. It will be equipped to reproduce actual plant conditions and thus answer questions dealing with the use of our "Ti-Pure" pigment. Also there will be equipment to test paper—its brightness, strength, and the like.

Before highlighting more of the work of the new lab and technical service groups, let's see why titanium dioxide is in the paper business at all.

"TI-PURE" SUPERIOR IN OPACITY

Most kinds of paper depend on minute air particles trapped within the sheet to give it brightness and opacity. These papers are made up of wood pulp, plus a filler such as clay, chalk, diatomaceous earth or titanium dioxide to add the desired whiteness and opaqueness. Each additive has its place. "Ti-Pure" LW titanium dioxide, for instance, is superior to other fillers on an equal weight basis for preventing printing show-through on lightweight papers.

Food wrappers and containers, to cite one important case, have been a major market for titanium dioxide, especially since self-service groceries became big business and speeded the trend to wrapping or packaging all foods, including vegetables, fruits and meats. These containers must be attractive to sell food—which often means they must remain white even in contact with greases, oils, and vegetable or meat juices. A prime steak on a clean-looking, white paper tray becomes an unappetizing-looking hunk of beef if its juices discolor the tray. Titanium dioxide is the only paper filler that can be depended on to keep this desired whiteness and also to remain inert.

Bread wrappers owe their sanitary-looking whiteness to titanium dioxide. Waxed board, such as that in frozen food boxes, butter cartons, and milk bottle

tops, is a rapidly growing field for "Ti-Pure" pigment. It is often used to give whiteness and good appearance to glassine used as a food wrap—on chocolate bars, for instance. Vegetable parchment paper, used for wrapping vegetables while cooking and for oily and greasy foods, also relies on the white pigment to improve its appearance.

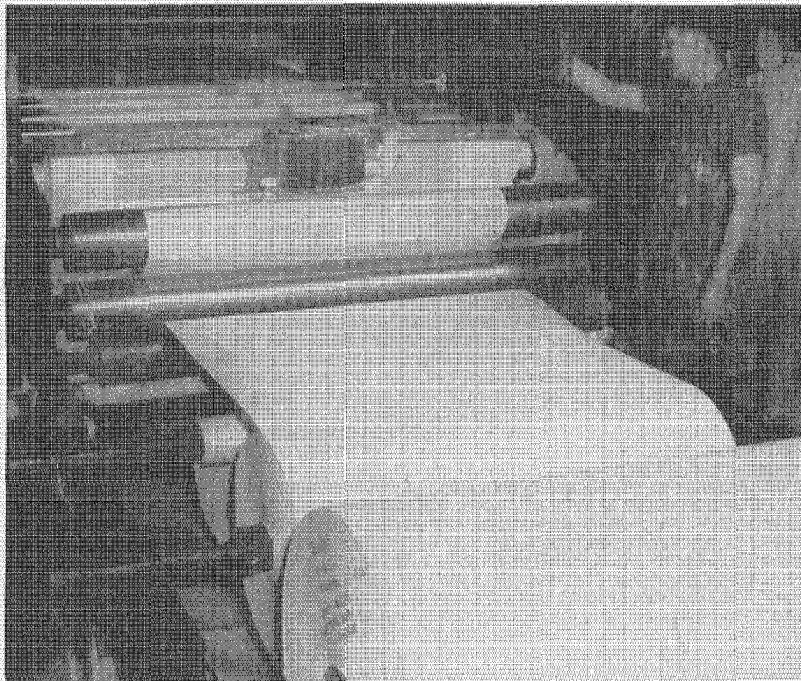
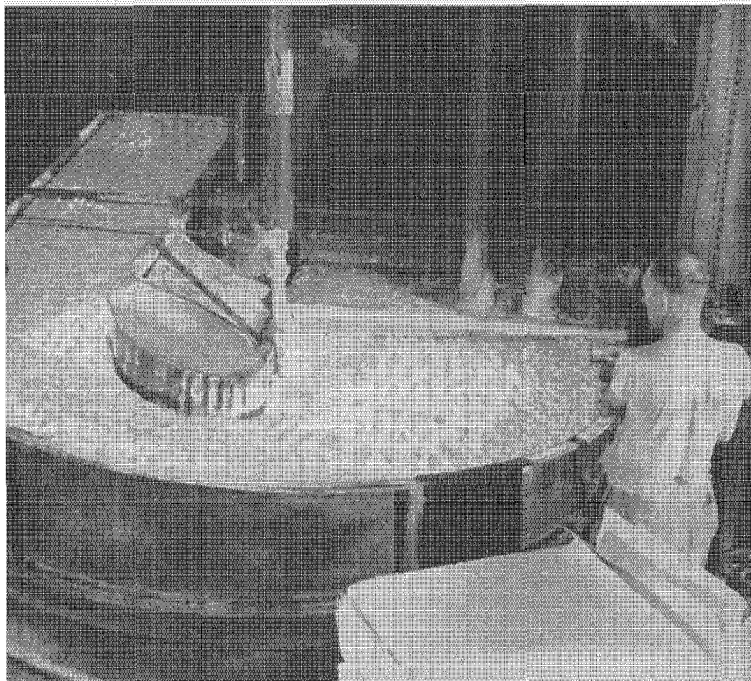
Porous papers, such as stationery and book and magazine stock, depend primarily on the presence of air interfaces for opacity and brightness. Extra whiteness is achieved by adding a filler, and "Ti-Pure" is preferred where light weight is of importance, such as in air mail stationery or mail-order catalogs.

Papermakers capture the whiteness of titanium dioxide in two ways. They add it to the pulp and water mix in the beater before the paper is formed, or they spread it on the surface of the finished sheet as a coating. If and when problems crop up in either application, the new Pigments Dept. service lab will be ready to do the necessary scientific sleuthing. For instance, a paper mill may seek guidance because it needs to cut the weight of its paper but can't take a loss in strength. Or a customer may have trouble giving his titanium dioxide coating the desired viscosity. Or again, a mill using "Ti-Pure" may feel it should improve the dispersion of the pigment and reduce the grit in its paper. In such cases, Du Pont technicians will work with the mills and when necessary bring the puzzler back to their lab for more study.

The Du Ponters who will start serving the paper trade don't exactly look for easy coasting, but they know they have a valuable product to bank on: titanium dioxide disperses well in water yet has a low slurry consistency; it has good beater retention, and a low adhesive demand; and no whiter pigment than "Ti-Pure" LW has ever reached the market. With its formidable array of advantages, titanium dioxide is just naturally going to whiten the face of more and more paper.

Papermakers capture the whiteness of titanium dioxide in two ways. It's added to the pulp and water mix in beater (below)

... or, as shown in this picture, it is made into a coating and spread on one or both surfaces of the finished sheet.



It was America's first. But, despite its strategic spot in transportation history, any self-respecting engineer would rather forget about . . .

THE DISAPPEARING TUNNEL

By PEG MINER

The sudden immersion in gloom, the deafening peal of thunder, and the clash of reverberated sounds in a confined space combined to produce a momentary shudder or idea of destruction, a thrill of annihilation . . ."

This account comes from a physician's first trip through a railroad tunnel in 1836. "The noise," he continued in his anxious testimony before a health commission, "would be a very great shock to delicate people." Concurred a fellow doctor: such an experience made one "liable to catch cold, inflammation of the lungs, erysipelas, rheumatism, and lumbago."

Evidently, great-greatgrandpa's opinion of tunnels wasn't very good. And it couldn't have been improved by the first—and by all odds the oddest—one ever dug in the United States. Although this fabulous tunnel wasn't noisy, it was by all means (1) unnecessary, (2) impractical to construct, and (3) just plain foolish.

Built from 1818-21, it was a connecting link in that intricate transportation network, the old Pennsylvania canal system. Under its arches flowed not only coal from the earliest mines in the Schuylkill region, but almost every type of product that could be hauled by horse-drawn canal boat.

Still, the mystery remains: why was it built?

First, it was constructed where no tunnel was needed. The path of the canal at that point, near Auburn at Orwigsburg landing, lay straight and true ahead, with no obstructions of any consequence. Why, then, did someone deliberately divert the canal by nearly a right angle in order to hit a hill he'd have to tunnel through?

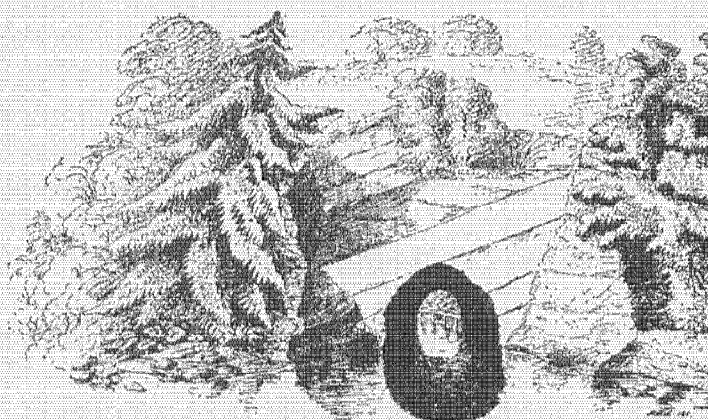
"Had the canal's path been located but a short distance down river, where the railway cut was later made," says Drinker in his book *Tunneling*, "this tunnel might easily have been avoided altogether."

Second, as long as he was doing things the hard way, why didn't the engineer pick a hill that was high enough? The highest point of the hill he did choose was a meager 40 feet above the tunnel.

Still the work went ahead, and America's earliest tunnel was cut through that hill's red shale. The excavation was 20 feet wide and 18 feet high from the canal bottom, and it was originally 450 feet long.

Unimpressive as modern tunnels go, the citizens of

that era found it sensational. In a way, they had a right to. Those were, it should be remembered, the days when dynamite didn't exist, power tools hadn't been invented, engineers were little more than surveyors, and capital was scarce. A tunnel was definitely a feat.



This picture, from a 1913 copy of "The Pilot," was described as "The first tunnel in the U.S., built near Auburn, Pa. in 1818-21. Horses that pulled boats passed over top of hill."

Donning their Sunday finery, sightseers came in great crowds by stage and private conveyance from Philadelphia. "And that," reports Drinker, "was one of the chief causes in promoting general public interest in the canal."

The whimsical tunnel was fated to disappear, for later engineers saw the hill for what it was—a molehill, not a mountain. By 1837 the tunnel was sliced to about half its length. A decade later it was widened and shortened to only 160 feet, and finally, about 1860, its roof was completely cut through to the blue sky. What had begun as a tunnel became an ordinary ditch.

Meanwhile, the canal system originally dreamed of by William Penn had flourished, and helped give Pennsylvania its name as the father of America's great public works. Even New York, with its more famous Erie Canal, yields

to that commonwealth the honor of conceiving and planning this country's first mammoth transportation system.

The record, even for these days, is impressive. Between 1791 and 1828, Pennsylvania incorporated 36 railroad, canal and navigation firms. By 1831, these companies had constructed 1,048 miles of the canal system.

BLACK POWDER HELPED BUILD THEM

These grand old canals occupy a special spot in the Du Pont Company's affections, built as they were with the aid of black powder from the original Du Pont mills on the Brandywine. Moreover, they were something of a proving ground for Company sales policy in those days. For Eleuthère Irénée du Pont had a hard time selling canal men on the idea that expensive-but-strong blasting powder was almost inevitably cheaper in the long run than inexpensive-but-weak powder.

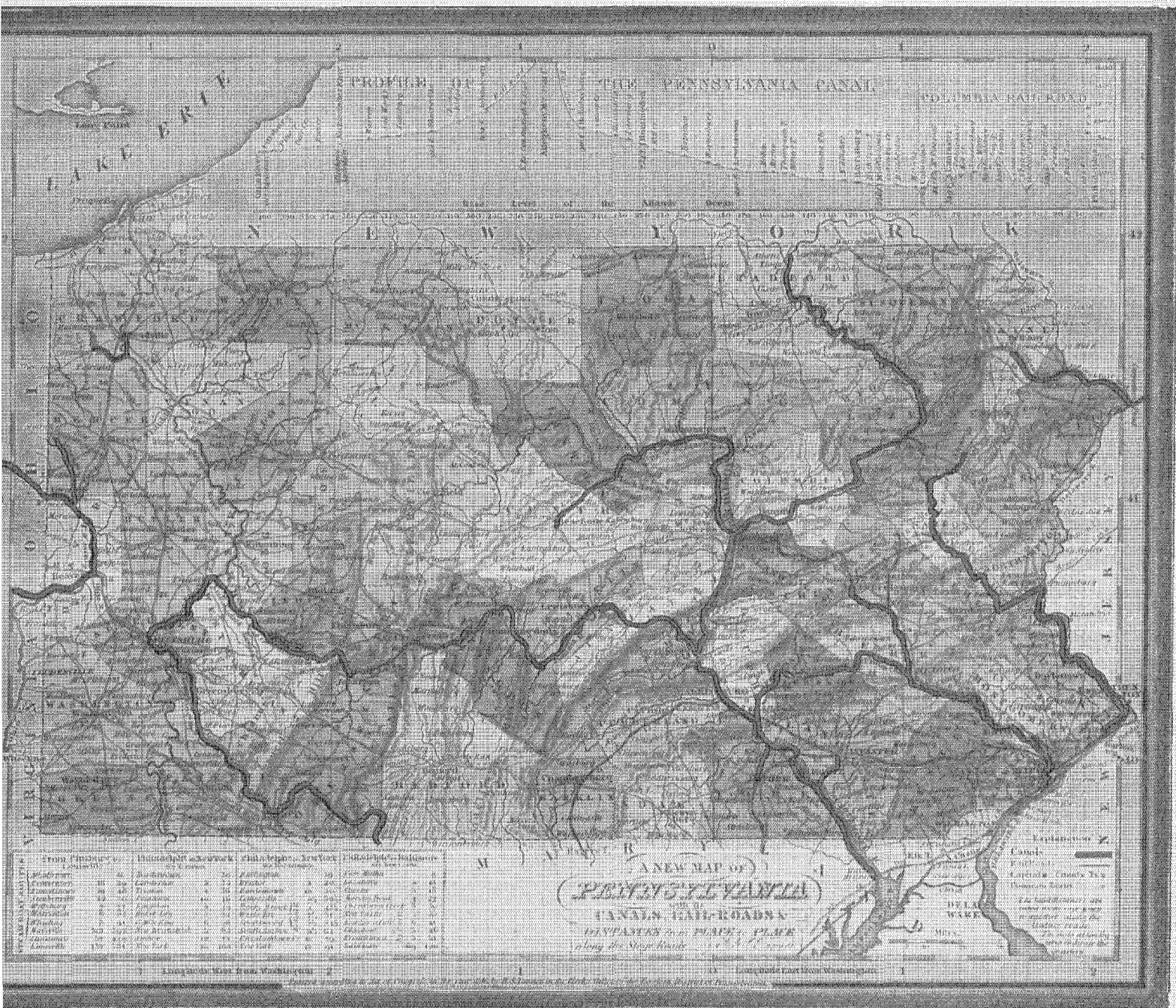
"We wish to conquer the prejudice among rock blowers that any powder is good enough," stressed a Du Pont letter of 1823 to Geo. D. B. Keim, working on the Reading, Pa. section of the canals. "The only thing wanted in

gunpowder for blasting is Strength. And if powder at \$5 per Keg contains in one Keg the same strength as is contained in two Kegs of inferior powder at \$4, the former is the cheapest.

"No man would buy a hogshead of Brandy without knowing if it be of the 1st or 4th proof." Keim evidently was interested in sampling high-quality blasting powder, for old Du Pont records show that he soon bought 50 kegs of it.

In a few years, Keim and his fellow canal men had finished their work and the Pennsylvania system, linking the Schuylkill and the Susquehanna Rivers with the Ohio, was complete. Besides its own claim to importance, it is interesting to note that this canal network included not only America's first tunnel, but her second, third and fourth transportation tunnels, and her first railroad tunnel (built on the Allegheny Portage in 1831-33 to connect the Central and Western Division Pennsylvania Canals).

With such an array of accomplishments, 19th century Pennsylvanians had a right to the nickname their commonwealth still bears—the "Keystone" of the Union.



The picture of health

*... is an apt name for the x-rays that industries throughout the country
are taking to check the health of their employees*

By DAVID J. PHELAN

The young job applicant swallowed hard and leaned closer to the examining physician.

"What's that again, Doc?" The doctor repeated the news that the x-ray showed he had tuberculosis.

"TB? But I just took an Army physical day before yesterday, and nobody told me I had TB."

The doctor placed the x-ray film before a viewing light. "These telltale shadows on your film indicate a fairly advanced case. Tell me, why were you rejected by the Army?"

"My hearing. After they found it was bad, they stopped the exam, so I didn't get a chest x-ray. Not until the one here today."

Fortunately, a vigilant industrial medical program picked up the young man's case and rendered a real service both to him and to the community. Early detection saved his life and stopped the possible spread of the disease.

Cases of this sort are exceedingly rare today, simply because the chest x-ray has achieved almost universal use.

In the opinion of Dr. Joseph B. Stocklen, controller of tuberculosis for Ohio's highly industrialized Cuyahoga County, the widespread use of chest x-rays has been the greatest single advance made in uncovering tuberculosis, and has contributed greatly to the dramatic 50 per cent decrease in the tuberculosis death rate over the past five years.

Dr. Stocklen spoke specifically of community chest surveys, in which mobile units cover the city taking x-rays in industrial plants, schools, and even hospitals. Such units, employing built-in x-ray machines, make use of Du Pont "Fluoro-Film" x-ray film, a special film supplied in 100-foot rolls that record up to 450 individual miniature chest x-ray pictures.

A community service of this sort means much to the small company, and forward-looking management cooperates fully with the public health departments to protect its employees. A good example is the Nettleton Steel Treating Co. in Cleveland, Ohio, where President Robert F. Coleman recognizes the need not only for modernization and expansion, but also sees the value of protecting the health of his 27 experienced workers. In cooperation with the Cleveland Health Department, Nettleton employees have chest x-rays periodically.

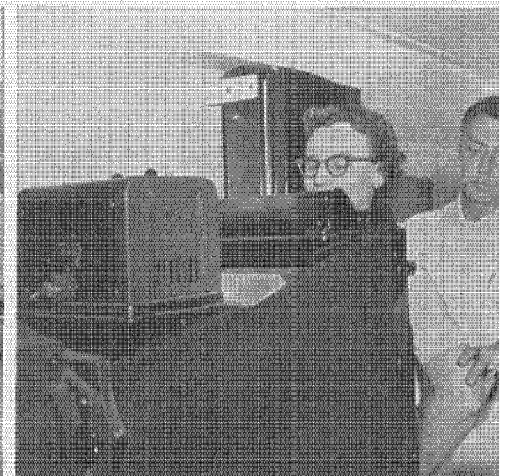
Not just the small company, but industry of all sizes, has joined hands with private doctors and community health officers to extend the use of the chest x-ray. Today by actual count more people are x-rayed than are finger-printed.

A large corporation, because of its great number of workers, can make an effective contribution to the tuberculosis case-finding effort of any community. The Chrysler Corp. is an outstanding example. All of Chrysler's 142,000 employees had chest x-rays before

Nettleton Steel Treating Co., Cleveland,
protects health of all its 27 employees

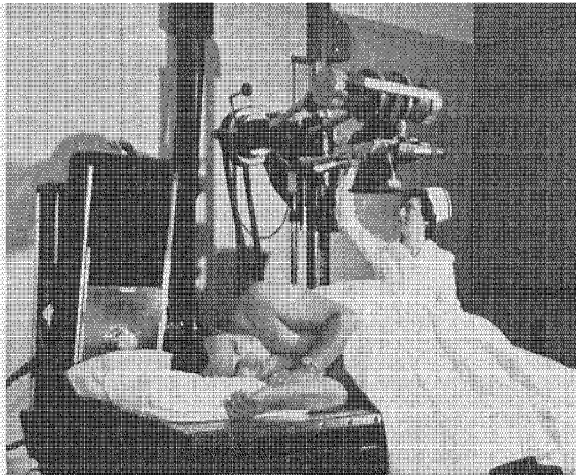
who are x-rayed by county health department mobile unit. Last year such units

took more than a quarter million
chest x-rays in the Cleveland area.





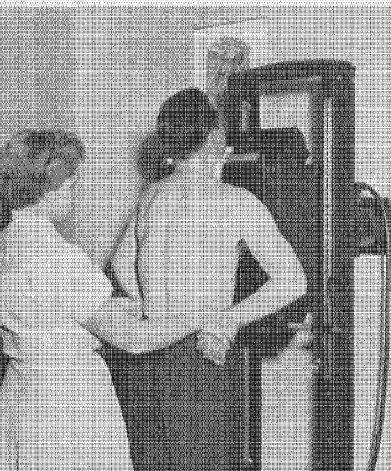
Chrysler Corp. of Detroit uses latest medical equipment, such



as 32 x-ray machines, for periodic check on its 142,000 employees. Microfilm file of



more than 2,400,000 medical records at Chrysler aids in wide health program.



Doehler-Jarvis Division of the National Lead Co., Toledo, O.



takes chest x-rays of all 9,000 employees. Here Dr. Marvin C. Green of the medical



department examines films and advises employee to visit his family physician.

starting work, and the 80,000 chest films taken yearly show that the job of checking never stops. The medical department at Chrysler's Detroit headquarters has on file more than 2,400,000 medical microfilm records on 600,000 persons, and more than 1,000,000 chest x-ray pictures have been taken.

Industrial health programs have a manifold purpose, according to Dr. Marvin C. Green, who is in charge of the medical program at the Toledo plants of the Doehler-Jarvis Division of National Lead Co. Among their many goals are improved employee health, better human relations, and decreased absenteeism. At Doehler-Jarvis, a leading producer of die castings, the medical program goes beyond these defined goals and gives its workers protection against conditions which can be cured or corrected if early detection is made. This is important in tuberculosis, for instance, where trouble can go unnoticed because of the absence of early symptoms.

If a small x-ray shows an abnormality, the industrial physician usually rechecks by taking additional chest pictures on larger films, such as Du Pont's 14 x 17 "Xtra-Fast" medical x-ray film, a size ideal for

comprehensive study of large body sections. If the large film confirms the presence of disease, the employee's family doctor is called in, and the treatment can be started. As Dr. M. W. Jocz, Chrysler's assistant medical director, describes it, the industrial medical program acts as an extension or outpost of the community health effort, and makes many valuable contributions to both the private physician and the public health officer.

The National Tuberculosis Association estimates that a single case of tuberculosis costs a community almost \$15,000. This figure includes medical care, compensation, loss of income, and relief payments. Early detection means faster recovery and reduces the cost by shortening the required hospitalization. Recognizing this fact, American industry last year spent more than \$17,000,000 for x-ray equipment and supplies, primarily to maintain and expand the drive against tuberculosis through chest x-rays.

The continued efforts of the industrial medical program, the family doctor, and the public health officer are rapidly pushing tuberculosis off the list of major killers in the United States.

First established as an industrial rubber,
neoprene is appearing in more and more
consumer products. Today you expect to find...

Neoprene at home

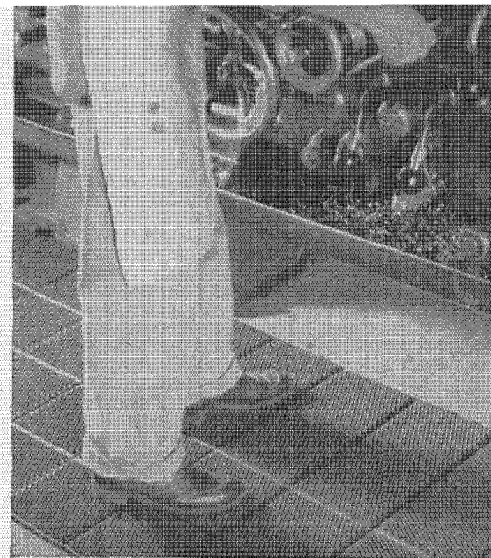
"The man-made rubber for tough industrial jobs," said our Rubber Chemicals Division informant. "That used to be an adequate thumbnail description of neoprene. But it isn't any longer, because rubber manufacturers are finding that tough jobs aren't restricted to industry.

"Take neoprene gloves, for example. For a long time users of industrial gloves knew of neoprene's superior resistance to heat, oil and grease. Then one day someone suggested that glove makers tell it to the girls. The result is that long-wearing household gloves of neoprene now protect feminine hands from the rigors of washing dishes and scrubbing woodwork.

"Or take industrial air hose, the kind used on compressors in paving work—it's made of neoprene for resistance to sunlight on the outside and hot lubricating oil on the inside. From there it was a logical step to neoprene garden hose, where resistance to weathering is a factor in hose life. I could quote other examples of this transfer of ideas from industry to the home, but you get the idea.

"The secret of neoprene's success in industry has been its ability to survive punishment, not only from sunlight, heat and oils, but from oxygen, abrasion and a variety of chemicals. And these same qualities are winning neoprene a growing place in the household products field. If you're doing an article on neoprene, I'd emphasize that trend if I were you."

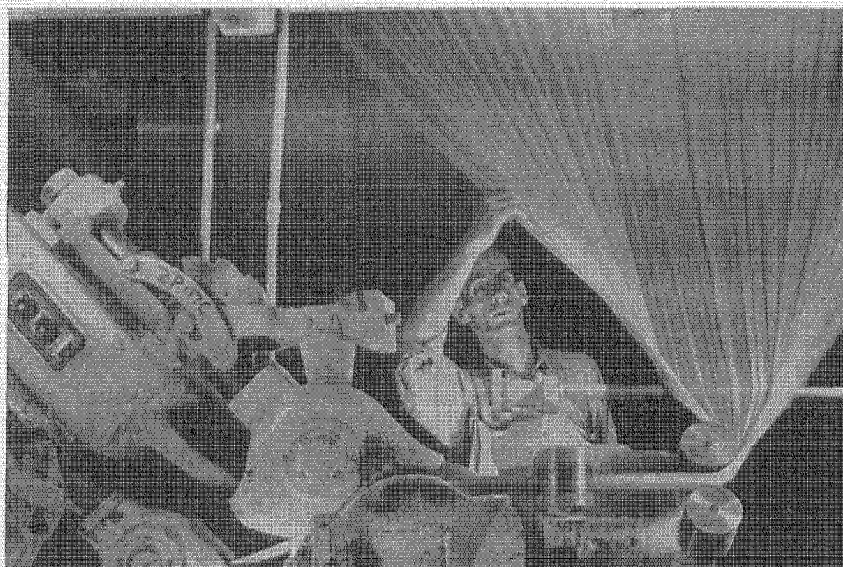
We said we certainly would ... perhaps with pictures.



From this neoprene standing mat designed for plant comfort and safety ...



Neoprene-coated fabric used in protective clothing was the forerunner of...



Shown here during manufacture, neoprene is used by rubber fabricators to make many products for industry and home.



Industrial gaskets that withstand heat and chemicals are made of neoprene ...



... came this gaily colored sponge mat of the same material for the homemaker.



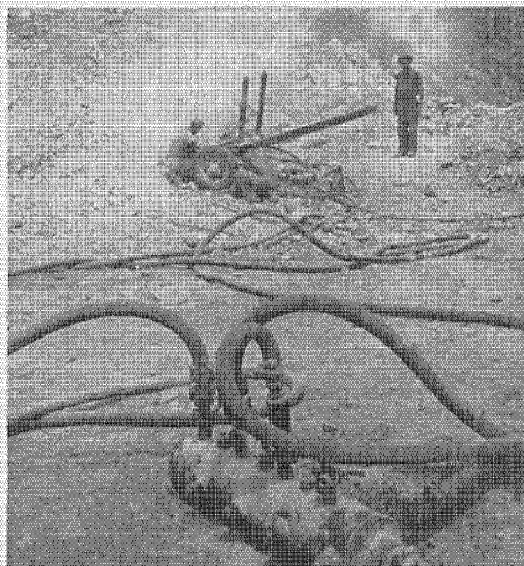
Widespread plant use of neoprene gloves led to their introduction at home ...



... where they help banish the "rough, red hands" deplored by every housewife.



... neoprene-coated rainwear that combines good looks and weather resistance.



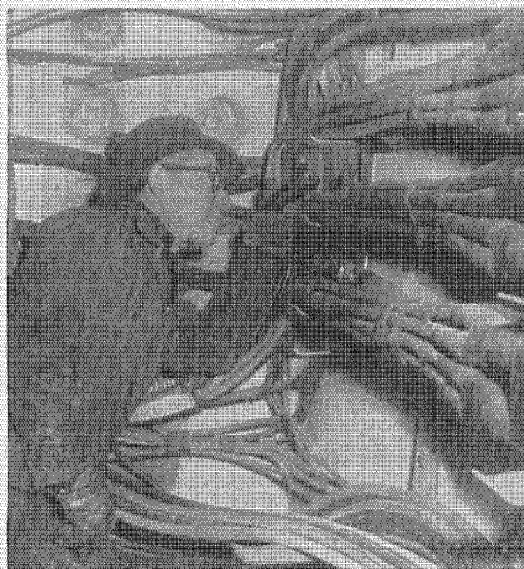
Heavy duty air hose with tube and cover of neoprene could be called ancestor ...



... of this sturdy garden hose whose neoprene cover resists cracking in sunlight.



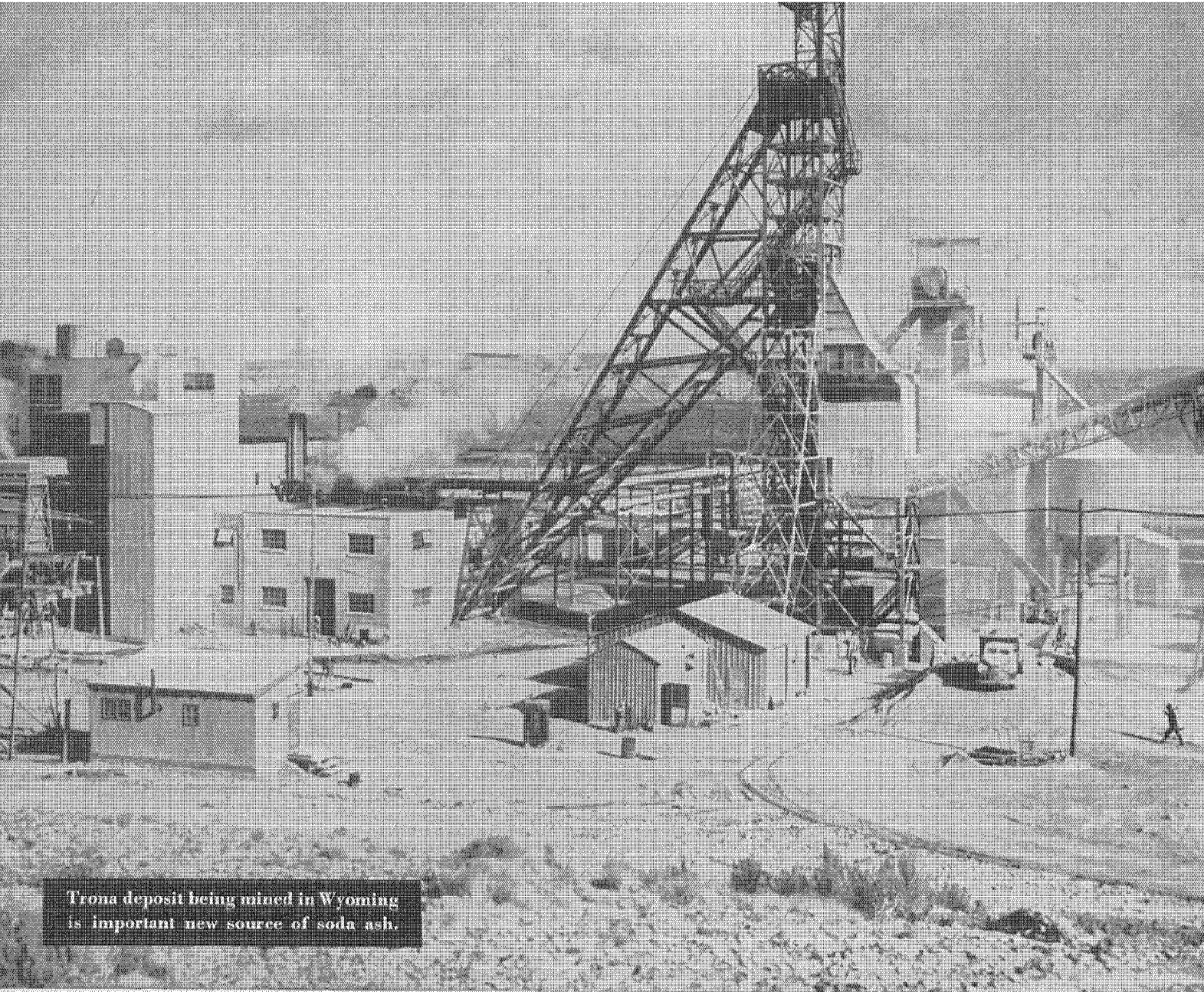
... as is the heat- and fat-resistant gasket in lid of this home pressure cooker.



Thousands of miles of high-voltage cable are protected by neoprene jacketing ...



So, also, are cords on deep fryers and other appliances exposed to heat, grease.



The duster that struck it rich

Drilling for oil, the crew found chemical gold instead

By FRED J. WATSON and GORDON H. KESTER

The drilling rig of the Mountain Fuel Supply Co. was set up on the sunbaked wasteland of southwestern Wyoming, 18 miles from the town of Green River. It was the summer of 1938, and the crew was prospecting for oil.

Eight hundred, then 2,800, and finally 3,169 feet down chewed the drill. But no oil. It was a dry hole, a duster, and the crew reluctantly pulled the casing to

move on. Luckily for our story, the drill cores were saved. They showed deposits of various crystalline sodium salts near the 1,500-foot level.

One of the salts proved to be trona, a relatively rare, nonmetallic mineral made up of sodium carbonate and sodium bicarbonate—washing soda and baking soda. Trona is a brittle, brownish substance that looks remarkably like maple sugar candy, even to the

powdery white crystals on the surface. From it comes soda ash, the nation's third most important chemical—used in refining petroleum, aluminum, vanadium and uranium, in making water softeners, detergents, paper, sugar, bricks, glass and a long list of other familiar products, including bath salts.

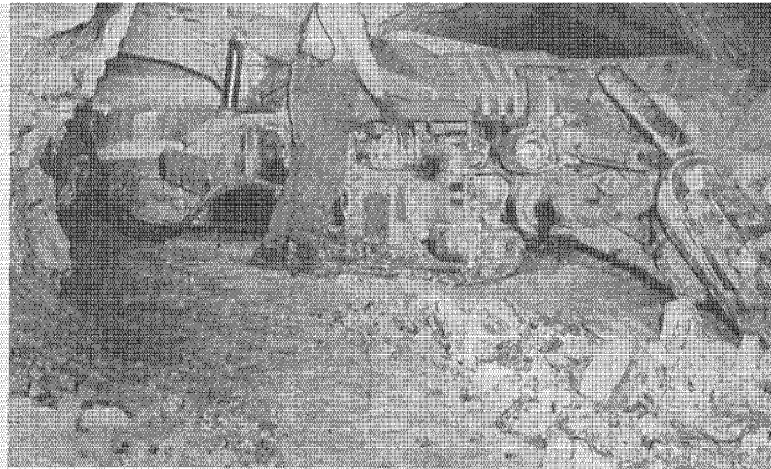
The deposit discovered by the oil drillers was ten feet thick. It was remarkably pure, uncontaminated by sodium chloride as many trona formations are. The deposit now is known to contain at least 250,000,000 tons, making it the largest in the world. That much trona would yield enough soda ash to meet all the needs of American industry for the next 35 years.

Today the chemical gold uncovered by the drilling crew is the object of a \$20,000,000 enterprise by the Intermountain Chemical Co., which mines the trona and refines it in an efficient new surface plant. The site is called Westvaco after the operating organization, The Westvaco Chemical Division of Food Machinery and Chemical Corp.

Although mine workings 11 miles long have been blasted out beneath the surface, the project is still in the development stage. Eventually the trona will be mined by the room and pillar method, common in salt and coal mines. The present production goal is 300,000 tons of soda ash a year, which will require an ore production of 2,400 tons a day. Plans call for tripling this production later.

Working faces in the mine are undercut, drilled to a depth of nine feet, loaded with Du Pont "Extra" E dynamite, and fired with Du Pont delay electric blasting caps. Each round of explosive knocks down almost 50 tons, we were told by G. B. Gaylord, mine superintendent. After the blast, loading machines move up, their crablike arms sweeping the ore into a moving belt which carries it to loading buggies. The buggies shuttle back and forth to a conveyor belt which carries the ore to a crusher at the foot of a 1,500-foot shaft. Twin skips hoist the trona to the surface at the rate of six tons a minute.

The ore is crushed further in the surface plant,



Mechanical loader, like a huge steel crab, rakes freshly blasted trona onto conveyor leading to shuttle car.

then dissolved in water so that insoluble impurities, primarily shale, will settle out. The soda ash is crystallized from the remaining liquor and dried. Pure enough to meet the most exacting chemical requirements, it is shipped in bulk or in bags.

A noteworthy feature of the Westvaco mine is the absence of wooden supports underground. Roof bolts driven vertically into the overhead support the square-cut main entries, while the other development openings are arched and normally require no support. The result: room for equipment and men to maneuver.

A NEW WRINKLE: SHORTENED UNDERCUT

Du Pont dynamite has been used at Westvaco since the first mine shaft was sunk in 1947. Our Company's salesmen and technical service men have joined with mine personnel in more than a score of blasting tests aimed at finding better and more economical methods of getting the ore out of the ground.

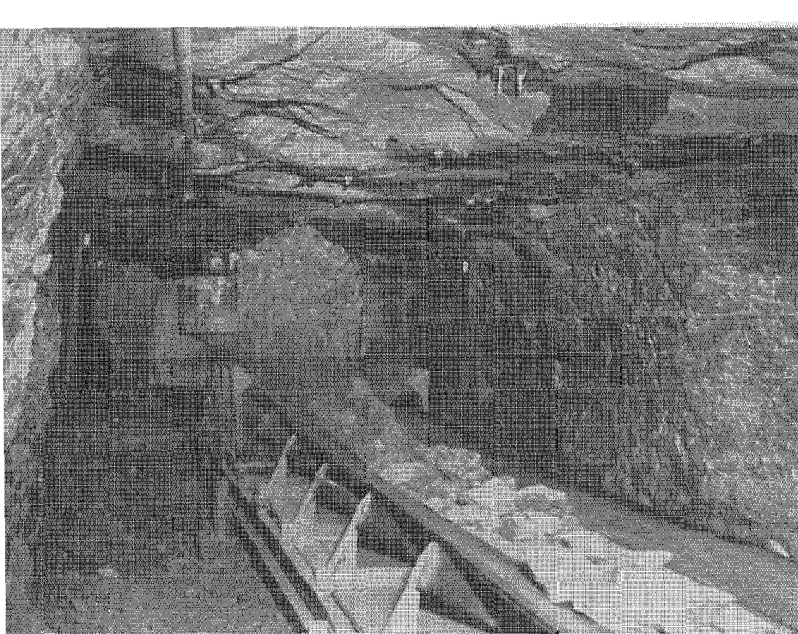
One of the most significant things to come out of the test program is an undercutting method believed to be unique in mining. Ordinarily the undercutter, an electrical saw that bites horizontally into the ore face at floor level, slices all the way across the face. This kerf, as it's called, gives the ore some place to fall when it's blasted. But cutting through trona is tough going, time-consuming and hard on even tungsten carbide bits.

A series of blasting tests proved that the whole 12-foot width of the face need not be undercut. A four-foot wide cut in the center and realignment of the drill holes and dynamite charges to compensate for it gave satisfactory results at a saving in time and money.

L. K. Marshall, the engineer who heads Westvaco's mine research division at Green River, considers the present ratio of four-fifths of a pound of dynamite to a



◀ After ore is removed, the mine face is undercut, drilled again and loaded with Du Pont dynamite.



Main conveyor carries ore to crusher, then to skip hoist which boosts it to surface at rate of six tons a minute.

ton of ore a good one, especially when balanced against the saving represented by the abbreviated undercut.

Important as it is to industry, the Westvaco mine also is something of a geological curiosity. New and unusual minerals have been found associated with the trona formation. One, a double carbonate of sodium and calcium, is called shortite. Other new minerals found there are bradleyite, loughlinite and searlesite.

The rock-hunting goes on. Recently Marshall spotted a mineral vein underground that he had never seen before. He sent a sample to a geologist and was awaiting a report when we visited the mine. By the time this is published a new mineral called marshallite may be listed in the geological journals.

The significance of the trona mine to the industrial future of the West has been put into words by Carm A. Romano, Westvaco's resident manager. As he told the Colorado Mining Association last year, "We are of the opinion that the development of trona in the intermountain area is the real beginning of a great chemical empire."

Very few dry holes can make that claim.

Tomorrow's greases

During 1954 Du Pont will start commercial production of fine silica, composed of spheres of amorphous silica so tiny that it takes ten billion of them to cover the head of a pin.

Now made in experimental quantities only, the material is undergoing extensive development as a thickener for multi-purpose greases and as a reinforcing filler for elastomers. Silica greases are made simply by milling a mixture of this fine silica with oil, as contrasted with the complicated compounding now required with metallic soaps as thickening agents.

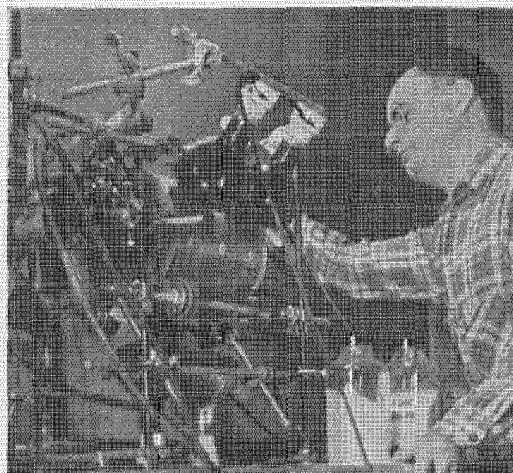
What will this new silica mean to the petroleum and automotive industries? A multi-purpose product that replaces many types of present-day greases will result in economy and ease of manufacture. For example, today a grease that resists water is necessary for the automobile chassis; another with high heat stability is used in the wheel bearings. Because Du Pont fine silica is both water-resistant and stable at high temperatures, it can be used in a single grease for both chassis and wheel bearing lubrication.

Du Pont's fine silica is a superior thickening agent because the tiny spheres are joined together into a highly porous sponge-like structure capable of trapping larger amounts of oil.

Greases made with Du Pont's fine silica are water-resistant because of a special chemical treatment which puts a raincoat on each tiny sphere. The melting point of the silica is so high the grease will not melt at any

temperature up to the ignition point of the oil. Manufactured in pelletized form, Du Pont fine silica is practically dustless, and can be readily milled and dispersed in oils.

Field development of PL-171 fine silica, the special formula designed for greases, is being conducted by the Petroleum Chemicals Division of Du Pont.



Research has led to the development of Du Pont fine silica, now undergoing extensive tests as a thickener for greases and as a filler for elastomers.



\$hampoos...

They're big business nowadays, thanks to good times and synthetic detergents like those made by Du Pont

You're like most Americans if you reach for a tube, bottle or jar of prepared shampoo when you wash your hair. Seventy per cent of the consumers queried in a recent survey bought shampoo regularly, contributing to the more than \$50,000,000 spent annually in this country for hair cleaning products.

This bonanza for toilet-goods makers has come about largely in the last dozen years. Since 1940 the sale of shampoos has tripled due to (1) a greater amount of consumer cash available for so-called luxury items, and (2) the impact of synthetic detergents on the shampoo market.

Ordinary toilet soap once scrubbed most American scalps. But it tends to leave hair tacky and dull after hard-water washing, and water in most areas is hard to some degree. Shampoos made with synthetic detergents, on the other hand, lather well, clean thoroughly and rinse easily even in very hard water.

Synthetic detergents are used in the three most popular types of shampoo: the clear liquid, usually a pale amber color; the liquid cream, generally milky white or a pastel tint, and the cream paste variety. Du Pont supplies "Duponol" fatty alcohol sulfate detergents to makers of all three types, and also offers help to customers in formulating the finished products.

The newest of seven Du Pont detergents going to the cosmetic trade is the formidably named "Duponol" EP fatty alcohol alkylolamine sulfate. It was developed primarily for the makers of clear liquid shampoos, whose products had tended to discolor and grow cloudy in storage. A shampoo made with EP retains its clarity and the warm, golden color that gives this luxury product elegance in the eye of the buyer.

Shampoos formulated with the new detergent lather freely, too, and when compounded according to Du Pont recommendations have a controlled cleansing action that leaves the hair not only clean but also soft and manageable. "Duponol" EP also can be used in making liquid cream shampoos, although another "Duponol" is sometimes preferred in these formulas for greater economy.

The Du Pont laboratory at Deepwater Point, N.J., where the detergents are developed, is in many ways a miniature shampoo plant. Much of the work done there aids the small customer who has limited research facilities.

For proper evaluation, each detergent candidate at the lab is made into shampoo by blending it with water and a variety of other ingredients, such as thickening agents, foam builders, or hair conditioning agents.

"This is a tricky business," one chemist said. "We tested and turned down 200 candidates before arriving at EP. You can have two excellent detergents; one will make a good shampoo and the other will be a flop. The only way to find out which is which is to try them."

Du Pont Notes

An important patent relating to the fortification of bread and other cereal foods with lysine has been made available royalty-free to anyone who wants to use it. Du Pont has purchased all rights from the inventors, and the patent has been placed on the Register of Patents in the form of a free license to the government and people of the United States.

Lysine is one of the essential amino acids, the building blocks for proteins. Added to bread in small amounts, lysine potentially doubles the value of bread protein for tissue building, a fact of important implication in human nutrition. Du Pont, having perfected a process for synthesizing lysine, is supplying experimental quantities to the food industry for evaluation.

"No man should be fired just because he is an alcoholic," believes Dr. George H. Gehrman, Du Pont's medical director. "An alcoholic is a very sick man. If he wants to stop he should be given a real chance. When he stops drinking he is a somebody. He is a man of character and intelligence."

Acting on this belief, Dr. Gehrman has fostered Alcoholics Anonymous chapters throughout the Company and in medical organizations elsewhere. He credits the Du Pont program with salvaging more than 100 lives in the past ten years. Recently the doctor helped launch the Wilmington Association for the Study of Alcoholism.

Diversification receives greater emphasis in Du Pont's Explosives Dept., whose 51-year-old Eastern Laboratory was one of the country's first industrial research units. A new laboratory for organic chemicals research at Gibbstown, N. J. is charged with developing new products and new processes for the department. Routine laboratory functions associated with production have been shifted to process labs located at the plants.

The Explosives Dept. is already making dimethylterephthalate for the manufacture of "Mylar" polyester film, "Dacron" polyester fiber, and Du Pont's new photographic film base, but now is committed to a sustained effort aimed at finding added use for its skills outside the explosives field.

The department is treading a familiar path. A generation ago, when Du Pont was almost wholly an explosives manufacturer, a similar diversification program was launched. It succeeded so well that today explosives account for only about five per cent of the Company's total sales.

A blueprint for disaster in the United States was outlined by Henry B. du Pont, a Company vice president, in a recent talk at Kinston, N. C. An enemy's best tactics, he said, would be to prey upon the "misunderstandings and misapprehensions of our people" and trick them into acting against their own interests. Some of the restrictive actions he described as a danger to national security: the weakening of present patent protection, a limiting of profits, a boost in individual income taxes, a disruption of employer-employee confidence, the placing of artificial restraints on industrial growth.

"Mylar" polyester film wins architectural billing. Architect E. Gunnar Peterson, designer of a new hotel at Woods Hole on Cape Cod, plans a dining room covered with a transparent dome of the strong Du Pont plastic. Fifty-three feet across at the base and 28 feet high, the dome will rest on a lacy gridwork of wooden strips.

"Diners inside will have a clear view of Little Harbor, Vineyard Sound and the islands," reports the Falmouth, Mass. "Enterprise." "At night they will be able to look up at the stars, with an outline of struts against the sky."

Nylon takes to the air in a series of tests arranged by cost-conscious Post Office officials. New nylon bags for air mail weigh half as much as the bags now used. If adopted on all air mail routes, the new bags could save the Post Office about a million dollars a year, since most air mail is carried on a ton-mile basis.

Clothes of ORLON Make Smart Gifts This Christmas

This Christmas you can find presents for the whole family that are beautiful, exciting and—best of all—that make life easier all year! Clothes of "Orlon" keep their good looks with less time for upkeep... give more time for leisure and living!



In any kind of weather clothes made of "Orlon" acrylic fiber hold their press and shape better. And when wet, they dry with the crease still in.



Washable clothes wash easier, don't shrink out of size when they're made with "Orlon". Sweaters and socks don't need blocking or stretching.



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Superior light fastness and simplified dyeing procedure with DU PONT "CAPRACYL"* DYES FOR WOOL

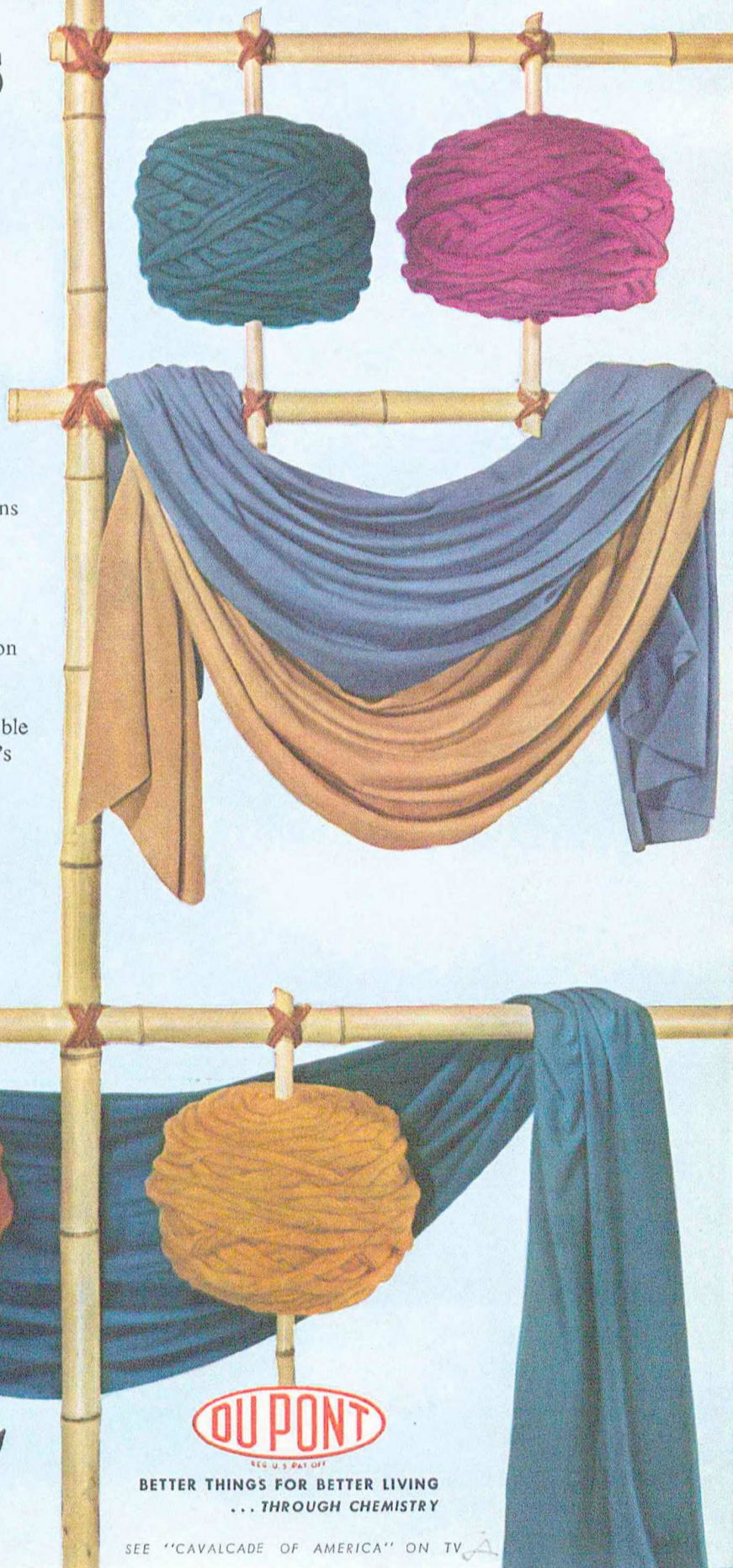
The "CAPRACYL" dyes are metallized dyes that produce excellent fastness results on piece, top, and stock. These new dyes, in a full range of colors, give the good light fastness needed for woollen men's wear, auto upholstery, carpets, and other type fabrics where exposure is a major factor. In addition to light fastness, the "CAPRACYL" dyes offer good wet and spotting fastness.

These new dyes are easy and economical to use. They are applied under essentially neutral conditions in a short dyeing cycle. The saving in time and chemicals has the valuable side effect of less damage to the wool fiber.

The "CAPRACYL" colors have high covering power, even on tippy wool, under proper application methods. They produce consistently level dyeings. By supplementing the "CAPRACYL" range with selected anthraquinone blues and greens, it is possible to produce practically all the light to medium men's wear and upholstery shades, all of which have excellent monotone fading characteristics.

For further information, or for technical-service helps on any dyeing problem, write E. I. du Pont de Nemours & Co. (Inc.), Dyes and Chemicals Division, Wilmington 98, Delaware.

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Du Pont Dyes



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