

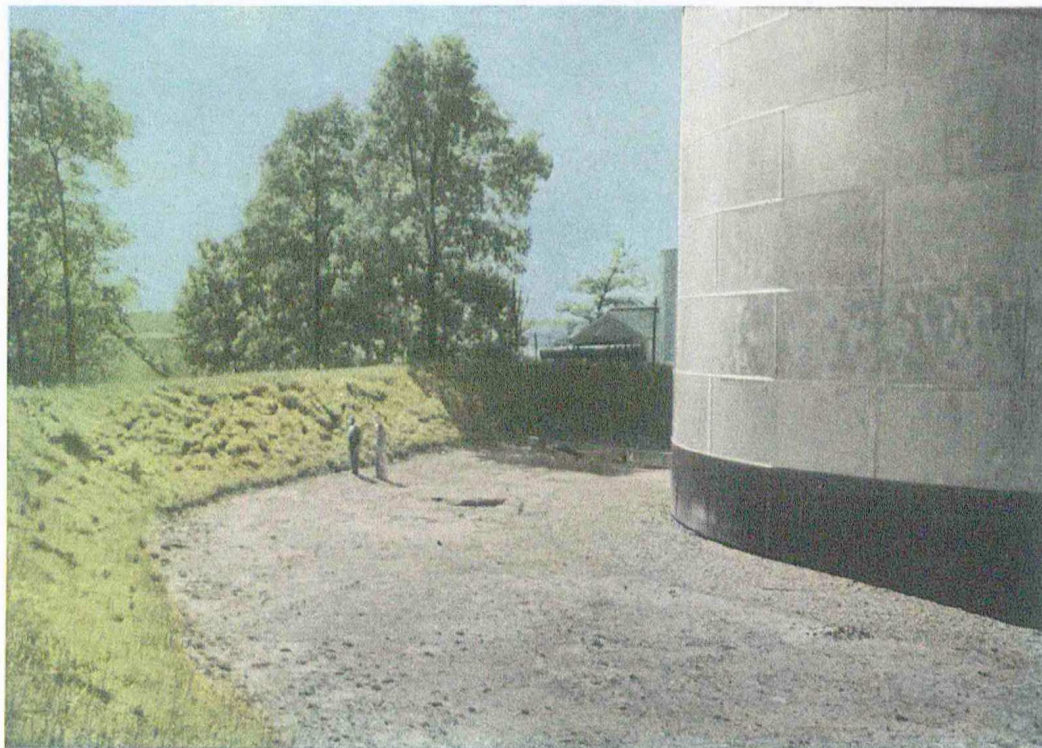
DUPONT

April • May 1953



DUPONT
BY APPOINTMENT

NEW DU PONT CMU



... weed and grass killer for industry

Small quantities of Du Pont CMU Weed Killer destroy most vegetation and prevent its regrowth for an entire growing season or longer. CMU controls most species that are a problem around industrial locations where weeds and grass harbor vermin, cause a fire hazard or are just a plain nuisance. Nonflammable, nonvolatile and noncorrosive to equipment, CMU comes as a wettable powder ready to mix with water.

CMU works through the roots and must be

applied to the ground so it can reach the root zone readily. As little as 40 lbs. per acre or 1 lb. per 1,000 square feet usually does the job.

It saves labor, cuts maintenance costs. One application of CMU spray takes the place of hand cutting, mowing and other methods of maintenance.

Du Pont CMU can be used to advantage in many areas around lumberyards, tank farms, pipe lines, railroads, parking lots, power stations, storage yards and other industrial sites.

E. I. DU PONT DE NEMOURS & CO. (INC.)

Grasselli Chemicals Dept. M.
Wilmington 98, Del.

Please send me full information on Du Pont CMU.

Name _____

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WHERE DO YOU WANT TO KILL WEEDS?

Wherever vegetation is an eyesore, a fire hazard or a maintenance problem, CMU is an effective means of control. For full details, mail the coupon.



BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

DU PONT MAGAZINE

Vol. 47 No. 2

JAMES H. McCORMICK, *Editor*

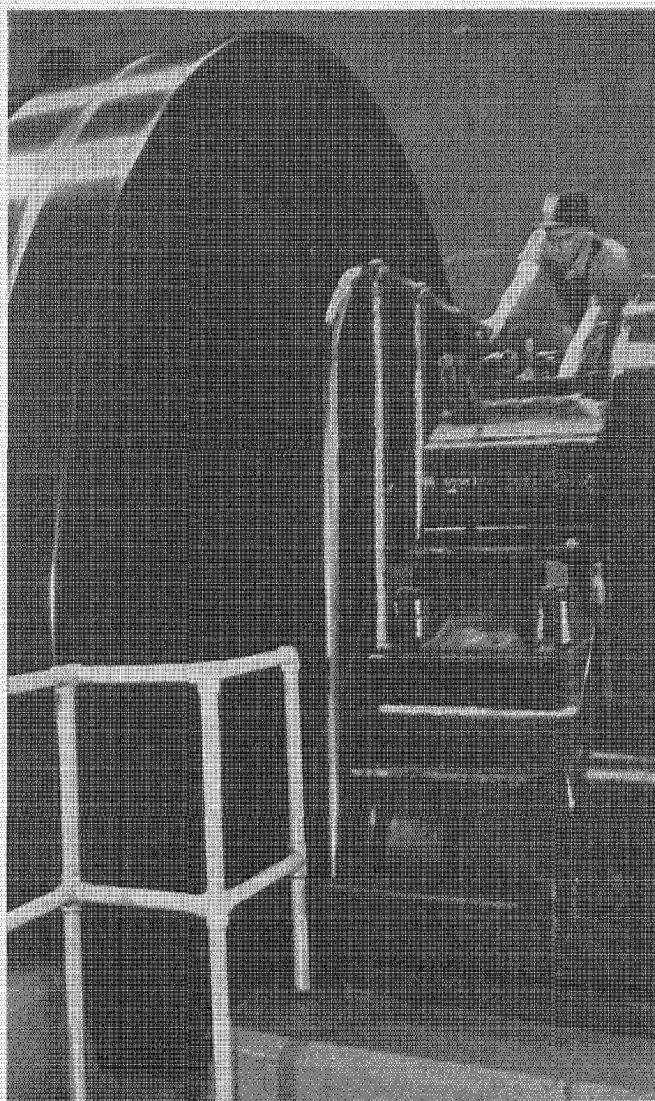
Associate Editor, GORDON H. KESTER

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The steel test tube

Symbolically, a chemist wields a glass test tube. But in several Du Pont departments, glass couldn't hold what our researchers are working with

By PEG MINER



Twenty-odd years ago, a professor at a New York university poised his red pencil and x-ed an exam paper. He had caught another lazy student trying to squeeze by without thinking. Said the student: "To make acetic acid, just add carbon monoxide to methanol." To orthodox chemistry, that was unthinkable.

"Today I hope no one remembers this," the professor has confided to us. "For later that 'ridiculous' reaction was carried out successfully by Du Pont."

The professor is definitely to be forgiven. By the standards of that day, he was right. It was only with the advent of high-pressure research that dozens of such reactions began to take place.

From this squeeze-play research have come such products as synthetic ammonia, antifreezes, plastics, mold inhibitors for bread, nylon intermediates, fertilizers, feed supplements and solvents.

All have their roots in the fact that gases, and often liquids, behave most peculiarly under severe pressures. In some ways, they are like people. Two men might go out of their way to avoid each other under ordinary circumstances. But, under the pressure of an air raid, you might find them in a shelter with their arms frantically wrapped around each other.

Who discovered this abnormal, and interesting, behavior of matter? Well, the study of chemical reactions under pressure was pioneered, in the academic research field, by scientists such as Le Chatelier and Ipatieff. Then, about the turn of the century, Haber in Germany came up with a high-pressure process for ammonia. And Harvard's P. W. Bridgman won a Nobel Prize for his fundamental work on the physical properties of matter under high pressures.

In the '20s, Du Pont began its industrial high-pressure work at its Belle, W. Va. plant. It bore quick

fruits. Soon our Ammonia (now Polychemicals) Dept. was turning out synthetic ammonia to free this country from foreign sources of fixed nitrogen for fertilizers, explosives and other products.

The plant's synthetic methanol helped make the expression "wood alcohol" passé, and cut the price by one-third in a short time. A procession of alcohols and acids began flowing from Belle, and in the '30s high-pressure hydrogenation played a part in bringing nylon to market.

This story, however, isn't meant to be a catalogue of products. Rather, we'd like to spotlight high-pressure research. With so many products already coming from it, does Du Pont have any need for it today? If so, what's going on? Where do we expect it to lead?

As a starter, we certainly are continuing to nurture such research. More than ever. At least five of our departments are currently engaged in it.

"BOMBS" STAND ENORMOUS PRESSURE

Each has a different motive for examining pressure phenomena. About the only thing they have in common is the trade-mark of all high-pressure studies—the steel test tube. Working at super-pressures and often high temperatures, these scientists have abandoned the traditional glassware of chemistry for metal "bombs" that can stand fantastic conditions.

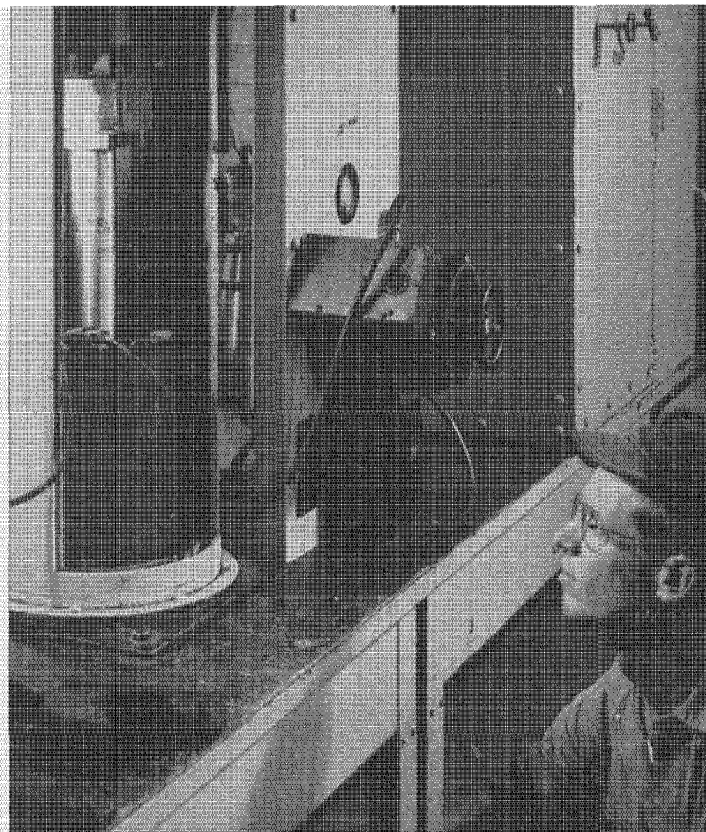
It's quite normal, for example, for Du Pont researchers to work at gas pressures of 1,000 atmospheres. That's equivalent to stacking three full grown elephants one upon the other—and placing them, if it were possible, on a postage stamp. If a steel vessel has a head with an area of only ten square inches, it has to be strong enough—and fastened down securely enough—to withstand the pressure exerted by 30 elephants.

This suggests that high-pressure research is dangerous. Let us hasten to state that it need not be. Here, as elsewhere in Du Pont operations, safety comes first. Every metal test tube has its rupture disc; every reaction is conducted from behind a barricade; every barricade has its ceilingward outlet for shock waves in case anything lets go. "We may lose equipment," say the scientists, "but we safeguard personnel."

As for the activities of our departments, let's look first at Polychemicals. Today its research is vastly different from the days when processes at the Belle plant were getting under way.

Polychem men now regard high pressure as one of many tools instead of virtually an end in itself. "So much has been learned," say these researchers, "that we feel we can handle practically any chemical reaction we're interested in, using basic know-how that's available."

This comfortable position isn't a state of stagnation. Many refinements in manufacturing processes are being studied. For example, ethylene gas, the raw material for "Alathon" polyethylene resin, tends to pick up any moisture that's around—and the resulting ethylene hydrates plug up pipelines. Recent studies



A trade-mark of high-pressure studies is the steel test tube, or bomb. This one is at work in our Organic Chemicals Dept.

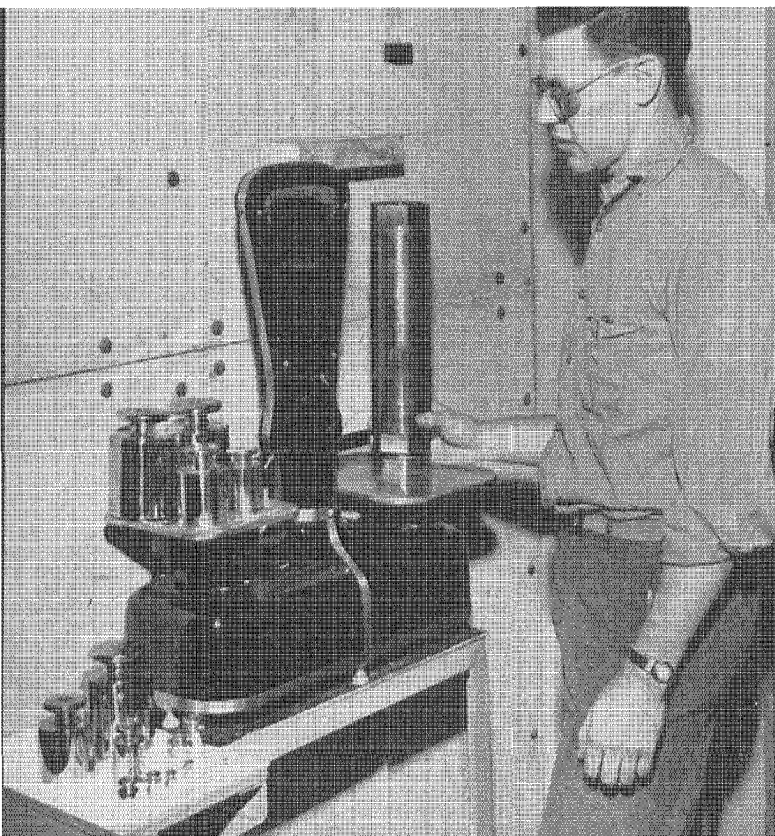
showed the pressures and temperatures at which these hydrates form. Also, since carbon monoxide is a major Du Pont raw material, Polychem is still holding it under the research microscope. And catalysts, the outsiders in a chemical process that speed it up or change its end products, are always of research interest.

Another old-timer in high-pressure work is our Chemical Dept., which has been making fundamental studies at super-pressures for many years. Gases, such as hydrogen, carbon monoxide and ethylene, are victims of this squeeze. "What will happen," these men want to know, "if we change the pressure, the temperature, the catalysts?" As they assemble such basic knowledge, they have a more rational approach to the study of chemical syntheses.

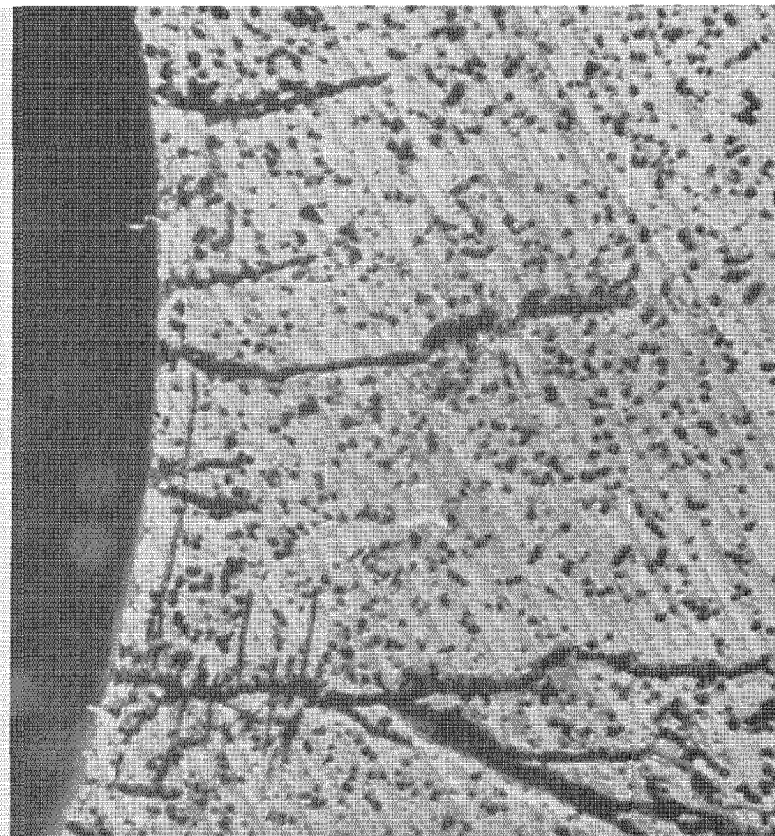
GROUNDWORK FOR NEW PRODUCTS

One result of this type of exploratory research is the unearthing of information that may be useful to manufacturing departments in developing new processes and products. "Teflon" tetrafluoroethylene resin, the tough guy among plastics, is an example.

"Teflon" was originally discovered when a chemist in our Organic Chemicals Dept. suspected there was something fishy about a certain gas cylinder. It had been filled with tetrafluoroethylene gas under pressure some time before, and when the chemist opened it, no



Weighing a bomb. It's quite normal for our scientists to work at gas pressures of 1,000 atmospheres, or 15,000 lb./sq.in.



Cases, under pressure, can cause severe damage to even the solidest-looking metal, as photomicrograph shows.

gas came whooshing out. Yet the container weighed the same as when the gas was added.

The answer came when the man cut open the cylinder. In it was a white resin, the material later to be known as "Teflon".

A more or less fortuitous discovery, however, is a far cry from a commercial process. You can't just fill a batch of cylinders with gas and wait for several months. That's where pressure research came in. With the help of special equipment and know-how, a manufacturing process for the infant product was turned out—one operating at low enough pressures to be economical.

As both Polychem and the Chemical Dept. agree, the best operation is the one in which the reaction goes on, but the pressures and temperatures are at a minimum. Why? Because it costs a great deal to achieve abnormal conditions. No one ever uses pressure for pressure's sake. It has to (1) cause a reaction to occur, (2) speed it up considerably, or (3) make it possible somehow to use less costly equipment.

Occasionally it's true that you can use a cheaper manufacturing process when you're operating under pressure. "Even so," says our Engineering Dept., "we can show you that these higher pressures spell equipment problems galore."

These engineers bear the brunt of design, material selection, and testing at Du Pont. Very special equip-

ment, of course, is needed for testing vessels at 15,000 pounds per square inch and above. At those pressures, steel vessels may rupture, fail from fatigue, leak gases, "cold flow," corrode rapidly, or become brittle. A tiny flaw in a reactor, one that wouldn't cause trouble otherwise, may suddenly become a catastrophe.

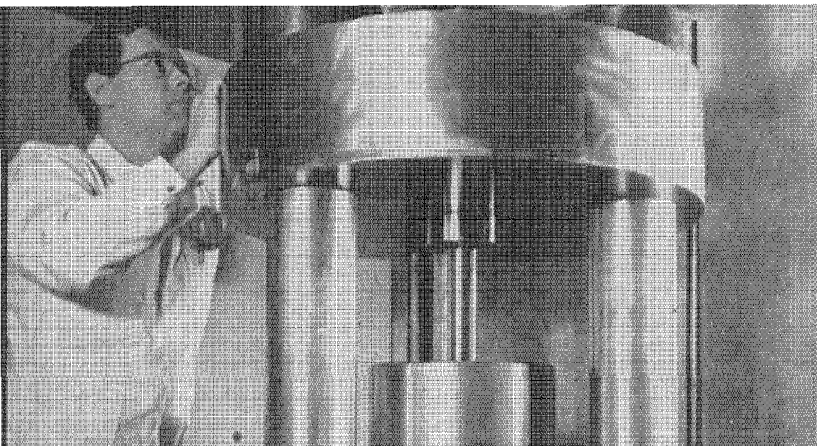
CASE OF THE STRAINING BOLTS

"Here's what can happen," cites an Engineering Dept. researcher. "You have a steel vessel with a bolted-down head. You double the diameter of the vessel, head and all. Does the total load on the head double? No, it goes up much faster. Instead of the previous three bolts, you may need ten. But you can't find room for ten bolts, physically speaking.

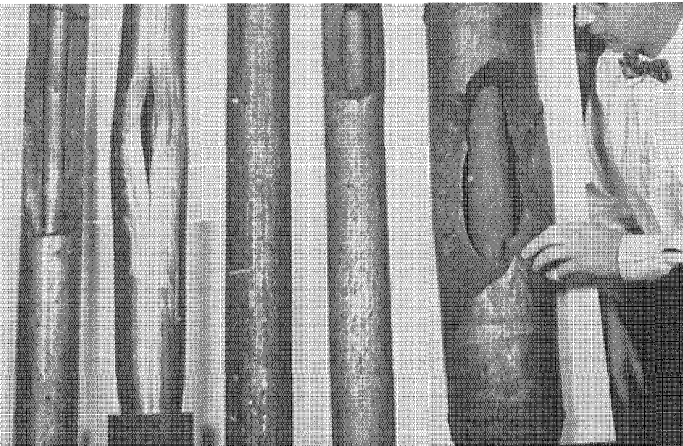
"You get an idea; you make new bolts out of a super-strong alloy steel. Then you don't need so many bolts. That's fine, until you apply the pressure. At that point you discover the bolts are so much stronger than the vessel that the bolts start tearing out of the main body of your equipment.

"Finally you decide the best course is to make the walls of the vessel thicker. But the metal has to be heat-treated, and you can't properly heat-treat a piece that thick. Flaws, very tiny ones, appear, and . . ."

This gentleman, needless to say, has gray hair. But his department always finds some satisfactory compromise between theoretically ideal conditions and



This intensifier, used in Engineering Dept. testing, can step up hydrostatic pressures from 5,000 to 200,000 lb./sq.in.



Tested to destruction, these steel vessels will yield valuable information concerning the effects of super-pressures.

dollars-and-cents operating economy, and then passes this information on to other groups in the Company.

The Engineering Dept. has many ways of dealing with mechanical difficulties. It has facilities for metallurgical research—research you'd expect to be done only by the steel industry. In its laboratories are heat-treating furnaces, x-raying machines to detect flaws in metals, and devices to examine the effects of continual flexing. In addition, it has hydrostatic pressure-testing machines that run as high as 200,000 pounds per square inch.

Another group involved in pressure research is our Organic Chemicals Dept. Practically from the beginning of Du Pont's entry into dye manufacture, pressures have been used.

"But judging from the pressures used nowadays in research, we were operating under a vacuum!" quips one of our Dyes and Chemicals men. Recently, however, this Division's efforts have been tending toward more extreme conditions. Not so much as a matter of manufacturing practice, but as a research tool. If you know what happens to a dye or organic intermediate at high pressures, you're a better judge of what can be done at lower ones.

All manner of strange things, from the viewpoint

Chemechol, a Du Pont device with a bright future in coal mining, breaks coal by chemico-mechanically produced pressure.



of orthodox chemistry, have happened in this research. "On one occasion we put hydrogen and carbon monoxide in a reactor," says one of our researchers, "applied the pressure, and came back some time later to draw off the reaction products. What came out? First pure hydrogen. Then the monoxide. Those two gases had just been sitting there, one on top of the other, snubbing each other even at tremendous pressures. Under such pressures, they were beginning to act like oil floating on water. Normally they'd mix as thoroughly as the oxygen and nitrogen in air."

ENERGY-RELEASING PRODUCTS

So far, outside of pure research we've been speaking only of Du Pont's work in connection with high-pressure processes. But that's not the whole story. We manufacture, for example, a number of products that are used to produce high pressures. These energy releasers—blasting agents, dynamite, and sporting powder—exist for the very purpose of generating gases under pressure.

The research that delves into such products is done by our Explosives Dept., where studies are made of the detonation pressures of dynamite, the burning pressures of sporting powder, and the behavior of shock waves. Mining, quarrying, and construction people constantly benefit from this research.

Where, you may ask, is Du Pont heading with all of its work in the field of pressure? What new scientific discoveries are in the wind? On this we'll have to be somewhat mysterious. In the early days of high pressure, Du Pont was pretty much alone in the field. Today we have strong competitors and, understandably, our men are not showing their hands around the table.

One thing is plain, though: our researchers are full of enthusiasm about the fundamental information they're gathering on the behavior of matter at high pressures. And if their discoveries ever do end up in your clothes closet, kitchen, garden, garage, factory, or office, we'll let you know.

Du Pont's New Blowing Agent

... for plastics, BL-353, joins "Unicel" ND

Chemically blown rubber had its start, so one story goes, when a rubber cement plant in Europe was destroyed by fire. Later, when the gutted plant was examined, some porous rubber was found. Apparently the volatile solvent used in rubber cement had puffed the rubber into a foamy material.

Today the chemical agents that have replaced the solvent bring you cellular rubber for seat cushions, toys, insulation and shoe soles, and blown plastics as well. In America the first blowing agents were chemical solids. Rubber sponge was made with easily-decomposed materials like sodium bicarbonate and ammonium bicarbonate—much as baking powder is added to a cake.

Today such compounds still find favor, since they're inexpensive. But new, and in many ways better, products of our Explosives Dept. have come on the scene. These are organic compounds like "Unicel" ND sponge rubber blowing agent, which releases nitrogen rapidly to create closed, noninterconnecting cells. In making expanded rubber, the mixture containing "Unicel" ND is put into a mold and heated. Then, when the pressure is released, the hot mass expands rapidly to form millions of tiny cells.

Springy, expanded rubber is highly resistant to the absorption of liquids and gases. And it has fine insulation and sound-deadening qualities.

The development of expanded plastics has opened another field for "Unicel" ND. Polyvinyl chloride resins are now made into closed-cell sponge by procedures much like those used to make sponge from natural rubber, GR-S, neoprene and other elastomers. The PVC sponge is light, strong, and has excellent insulating properties. Present uses include a buoyant material for life rafts and vests, and insulated containers.

Other techniques for using "Unicel" ND—ones that avoid the use of closed molds—are being developed. And the expansion of plastics other than PVC is also being studied. Still, the preparation of low-density expanded plastics made in open molds with "Unicel" ND presents some problems. That's where our Explosives Dept.'s new BL-353 comes in. This experimental blowing agent also releases nitrogen, but it can be used to form sponge with either interconnected or separate cells. Pressures aren't necessary, and it's possible to achieve a wide range of densities in both types of sponge. BL-353 is especially good for expanding plastisols in open molds. And it doesn't impart color or odor to vinyl-resin sponges.

The versatile new blowing agent is currently available in experimental quantities of one to five pounds, and larger ones by arrangement. In addition, the department's technical section has just issued a detailed technical bulletin explaining its use. Inquiries should be directed to Du Pont Explosives Dept., Room 5500 Nemours Bldg., Wilmington, Del.

The aristocrat of the silica family

By FRANK S. HAWLEY

Crystalline silica is about as well known to most people as the names of our country's vice-presidents. And this despite the mineral's being many times more prevalent than lead, tin, manganese, nickel, gold, silver, and platinum ores lumped together. To satisfy our own curiosity, we phoned ten college graduates chosen at random from among our friends, and only two—both chemistry majors—could name more than two uses for it.

Glass was most often mentioned, and no more logical answer is possible. Chemists will tell you that better than half of all glass is composed of silica. Then they'll hasten to add you can't create good glass out of just any silica, even the snowy white sand from ocean beaches. To make heat-resistant glassware for laboratory or home baking use, for example, glass-makers often specify sandstone so pure only three or four parts of iron oxide in 1,000 are tolerated.

Another giant consumer of pure crystalline silica is the chemical industry. Several firms, including Du Pont, manufacture sodium silicate, an adhesive and the starting point for many silica-containing compounds. Other companies make the new silicones or super-tough carbide abrasives.

Nothing yet known combines the low cost and heat-resistance of silica minerals for refractory prod-

ucts. Cores and molds for steel castings are major uses. Firebrick for the lining of white-hot iron furnaces is another. Here, as in glassmaking, the high silica content of the mineral is a must.

What's the story back of this pure compound of silicon and oxygen? In the beginning, we said that silica rock is a mineral. As such, it normally must be mined or quarried. There are deposits of value throughout the world, but few compare in quality with the type known locally as St. Peter's sandstone, being torn from the hills 20 or so miles from St. Louis by Pioneer Silica Products Co. It is a white, fine-grain quartz containing 99.7 per cent pure silica.

MINING YESTERDAY, QUARRYING TODAY

Miners have come and gone at Pacific, Mo. since the last century, but continuous operation awaited Pioneer's entry into the business in 1924. Until the '40s, the company mined crystalline silica in much the same way you'd burrow for most minerals. Crews would drill into the working faces with jackhammers, ram home a few sticks of dynamite, shoot, haul out the rock on mule-drawn carts—and start the same cycle over again.

Then, about seven years ago, Pioneer drove through the hill and into the open. Almost overnight

At Pacific, Mo. blasters at Pioneer Silica Products Co. load cans of "Nitramon" into deep holes drilled along quarry face.

There she goes—one blast kicking out 25,000 tons of tough, springy sandstone. Deposit is one of the country's purest.



mining switched to quarrying. Trucks quickly replaced mules and railroad tracks, but for a while drilling and shooting was much the same—small holes, dynamite, and a relatively small knockdown of silica rock that got wet when it rained or snowed and cost money to dry before grinding.

When the quarry face was worked far enough away from the mine, now used as an underground road to the mill, Pioneer was ready to try large-hole well drilling to cut blasting costs. This was the cue for Du Pont technical service men to study the deposit and recommend "Nitramon" blasting agent—21 cans and two primers to a hole, 24 feet between holes.

"Our deposit is tough and springy," explained assistant superintendent Ira Barnes, "and we're proud to get three tons of well broken rock from each pound of Du Pont's blasting agent. One blast will kick out 25,000 tons. Only the top of such a big pile gets wet, and the sand underneath stays ready to grind. Shooting with 'Nitramon' keeps my feet dry, too, since fragmentation is so good I don't have to do boulder-popping more than three or four times a year."

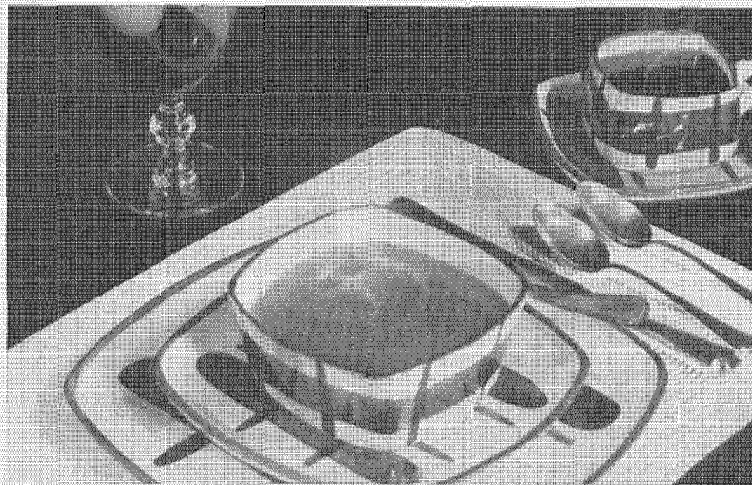
Pioneer Silica figures quarrying is only a third as expensive for them as their former underground drilling and blasting. The change has saved valuable time, and, as they put it, "brought us the benefit of safer blasting."

After quarrying, the silica rock is crushed, dried and screened for size. Some is then ground into silica flour. It's almost certain that the scouring powder in your kitchen is made up largely of the flour, and the chances are good that your dinnerware, wall tile, and porcelain bathroom and kitchen fixtures owe their gleam and glaze to this mineral. A couple of large building supply outfits include it in their formula for making asbestos pipe, shingles and siding. For exceptionally smooth work, steel foundries use it for a mold wash, and crystalline silica flour helps form the pots in which zinc is smelted. It also finds its way

"... We're proud," says Pioneer Silica, "to get three tons of well-broken rock from a pound of Du Pont's blasting agent."

into high-temperature cement, tank linings, and other refractory products, and even into match heads.

One customer mixes Pioneer's pure flour with lead for a paint base. "For this special grade permitting no more than an infinitesimally small amount of iron, we add a magnetic 'de-ironing' step to our process," general superintendent Curtone said. "We check iron content constantly, and can definitely report that there's been no increase caused by the fact that 'Nitramon' is packed in cans."



One of Pioneer Silica's customers is Blair Ceramics, Ozark, Mo. Silica adds gleam and glaze to their handpainted dinnerware.



Scouring powder is a major use for finely-ground silica flour.



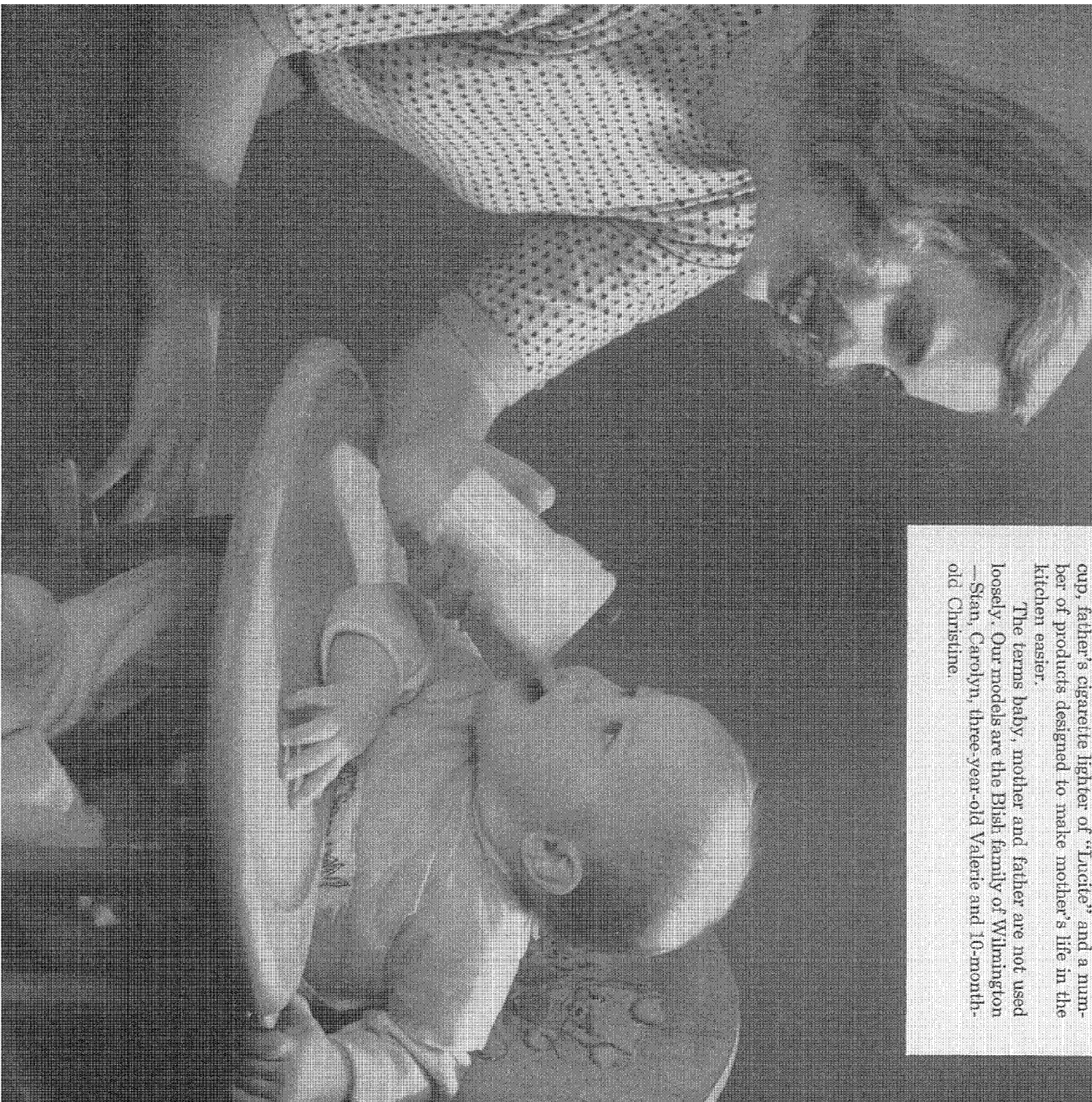
Molds for casting steel need silica sand's heat-resistance.

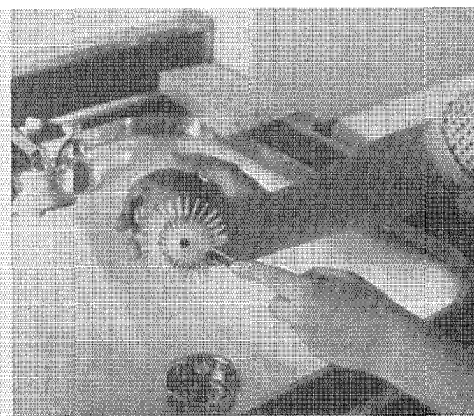
"Fiberglas" ceiling board is one of well-known family of glass and glass products made from the quarry's crystalline silica.



cup, father's cigarette lighter of "Lucite" and a number of products designed to make mother's life in the kitchen easier.

The terms baby, mother and father are not used loosely. Our models are the Blish family of Wilmington—Stan, Carolyn, three-year-old Valerie and 10-month-old Christine.





DUTIFUL WIFE, this. Box and lighter's fuel chamber are of "Lucite" acrylic resin.

UNBREAKABLE mixing bowls and plate scraper of "Alathon" polyethylene resin.

NYLON-BRISTLED utility brush is used to scrub vegetables, clean pots and pans.



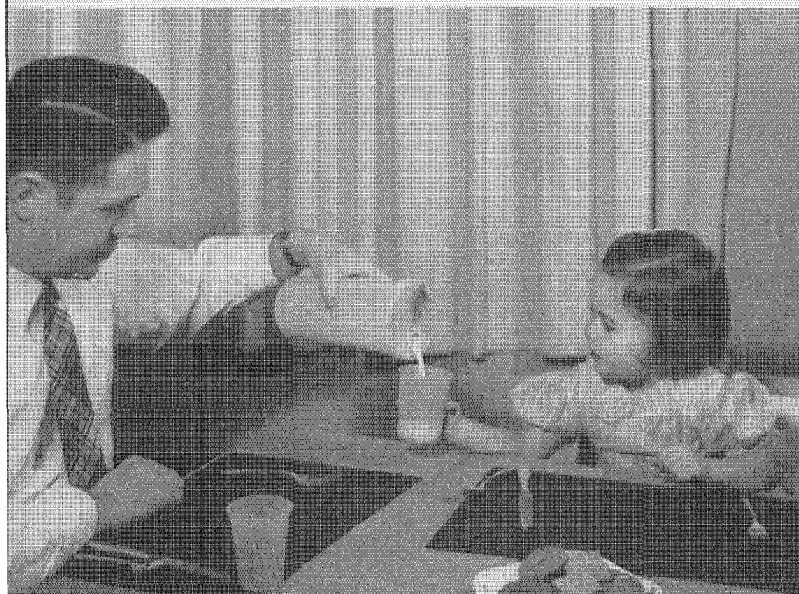
EASILY CLEANED, non-corroding sink strainer and wastebasket of flexible "Alathon" won't scratch enamel on appliances.

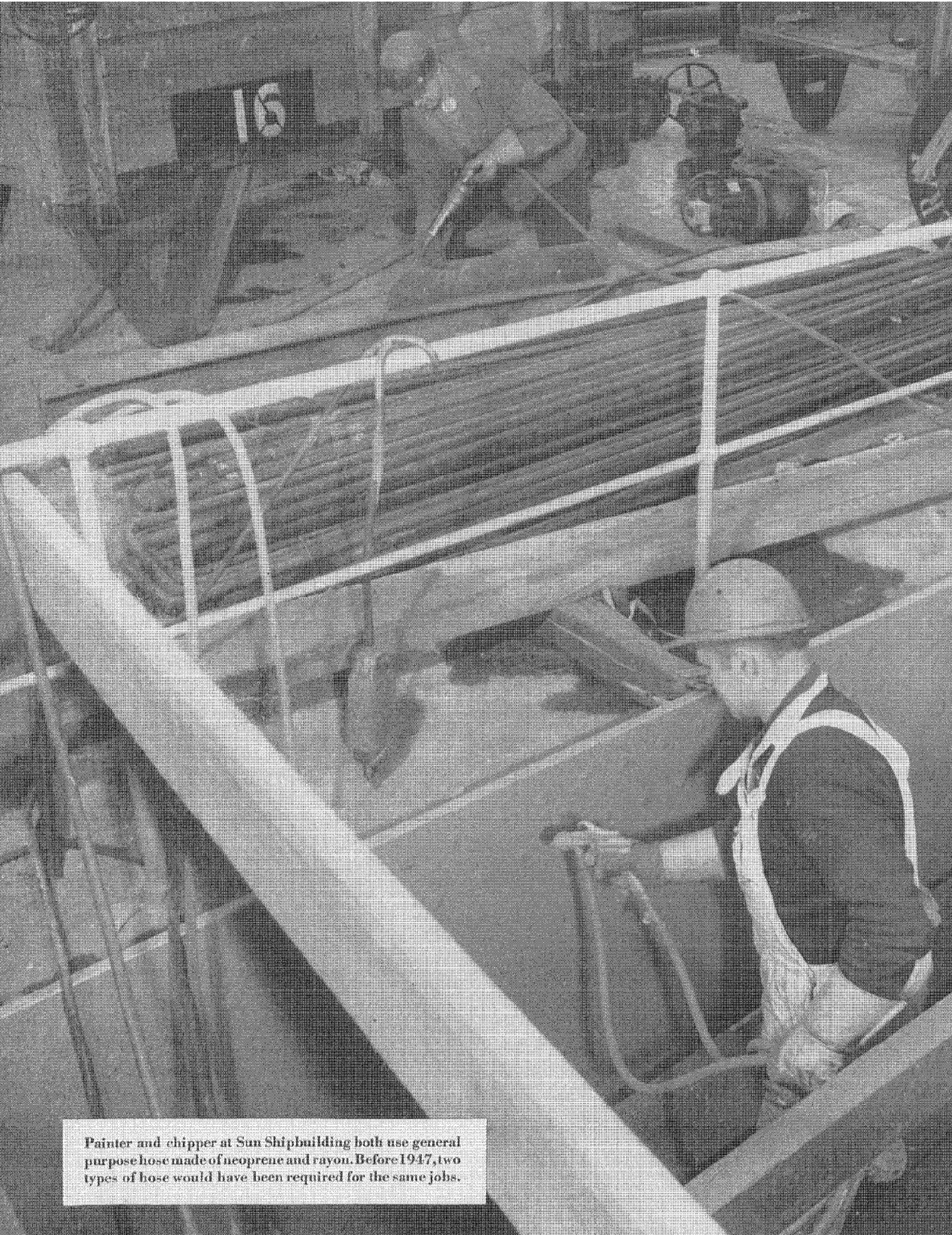


TWO-WAY HAIRBRUSH of "Lucite" with nylon bristles has slotted handles. Halves can be used together or separately, as here.

MILK 'N COOKIES. Quart-size refrigerator container and tumblers are of "Alathon". A seal on container keeps liquids fresh.

NO CHILD'S TOY, but a scale model of an electric trolley holds Daddy's attention. It's molded of tough, heat-resistant nylon.





Painter and chipper at Sun Shipbuilding both use general purpose hose made of neoprene and rayon. Before 1947, two types of hose would have been required for the same jobs.

General purpose hose has cut across old boundaries in

industry. Many hoses in one, it's truly ...

An uncommon carrier

By GERALD KING

Rubber hose manufacturers are busy proving there's a big demand for the jack-of-many-trades, even in an age of specialization. They're doing it with a light-weight hose that's equally suited for carrying oil, paint, grease, air, solvents, or hot water.

Before World War II, there was a special hose for almost every job. When a user wanted a heat-resistant hose, or one with oil and chemical resistance, or one he could leave out in sun and weather, he had to find just the right hose. The multiplicity of types represented a selection problem for users and an inventory problem for distributors.

Then came the introduction of general purpose hose in 1947. It caught on immediately with distributors and their customers, and one manufacturer after another joined the trend. Today general purpose is listed under one name or another in practically every hose catalog.

The key to the hose's versatility lies in its construction of Du Pont neoprene synthetic rubber, reinforced with high tenacity rayon such as "Cordura" rayon yarn, the type used in tire cord. Neoprene resists sun checking and the deteriorating action of oil and many chemicals. Rayon, stronger ounce for ounce than the cotton braid it replaces, makes it possible to build a tough hose that's still light and flexible.

Increased production of both neoprene and rayon since the war has helped the general purpose trend. But the big boost has come from the buyer. Having proved to his own satisfaction that one hose can do many jobs, he's bought general purpose in volume.

Large-scale production of one standard type has enabled manufacturers to use quality materials and

construction, and still hold costs down. General purpose hose, it's generally agreed, gives the customer more for his dollar today than he got prewar.

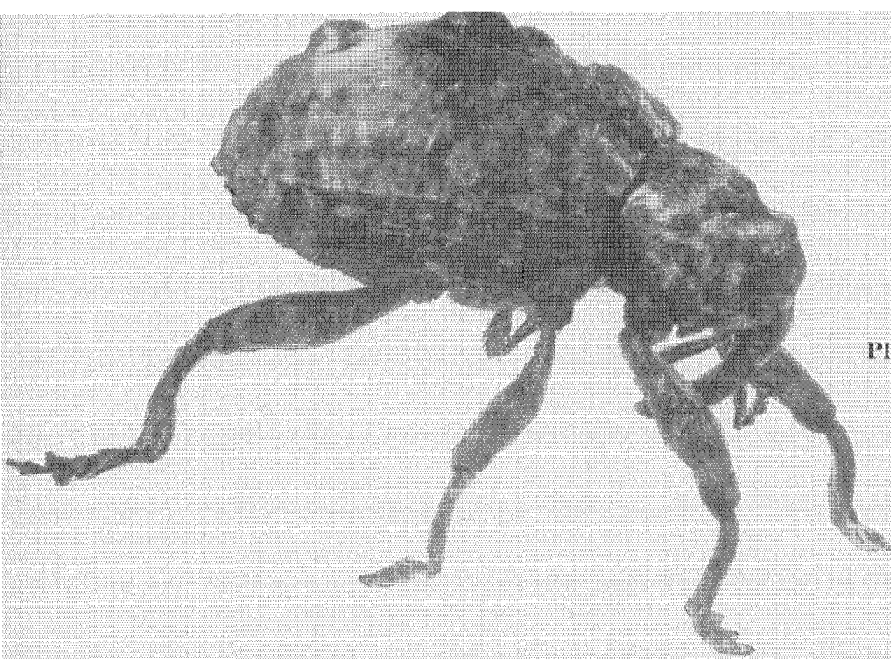
The customer's buying has been simplified, too. At a shipyard, for example, the same size hose is used for both water and air lines. The days when a workman had to hunt for special air hose are over. Now general purpose is used for both, and "the one who gets to the pile first grabs it," says the shipyard buyer.

One distributor told us he had been selling general purpose hose to a railroad car manufacturer for paint spraying. "It's cheaper than the special hose he used to buy," the distributor said, "and it's doing the job or I'd hear about it. A ruptured line—paint all over the place—I'd hear about it, all right!"

An oil-resistant cover is often required for a hose that was never intended to carry oil. That's why general purpose is used for the compressed-air cleaning of cotton textile machinery coated with lubricating oil. And that's why it's carrying air and water in bakeries, where vegetable oils soften ordinary rubber; in woolen mills with their animal oils, and in places like tanneries and canneries.

Some dealers recommend it for low-pressure steam lines. "I sell general purpose to a slaughter house for that," said one. "I wouldn't hesitate to run 30 pounds of steam through it. They use it for hot water, too."

"Since I've been selling general purpose hose," said the same dealer, "I can't remember any reports of failure in cases where it was used properly. In this business, that's a pretty good recommendation, especially since general purpose accounts for about a third of my hose sales."



Plum Curculio

The gardener's one-two punch

Insecticides and fungicides, combined by

Du Pont for the home gardener, spell double trouble for plant pests

By GORDON KESTER

Long ago a disappointed gardener voiced this lament:

"That which the palmerworm hath left hath the locust eaten; and that which the locust hath left hath the cankerworm eaten; and that which the cankerworm hath left hath the caterpillar eaten."

The quotation is from the Bible (Joel 1:4), and it paints a grim picture of man's helplessness before the march of the insects.

Fortunately, the modern gardener is anything but helpless in the face of crop-destroying bugs and diseases. Chemical insecticides and fungicides, unknown to his Biblical predecessor, are one of his guarantees of healthier, more productive plants.

Today's garden chemicals represent a big advance over those common as recently as ten years ago. The old-time chemicals often retarded the growth of the very plant they were intended to protect. All the formulations we'll be discussing here, however, are harmless to plants when used properly.

Application of the chemicals has been made easier for the gardener, too, thanks to combination products. There's no need to spray once for insects and again for diseases. Single products, scientifically formulated, give full protection against a long list of both.

Take the vegetable grower who has, say, beans, beets, cabbage, onions, spinach, potatoes, peppers, melons and tomatoes. He needs all-around protection against blight, mildew and a rogues' gallery of insects

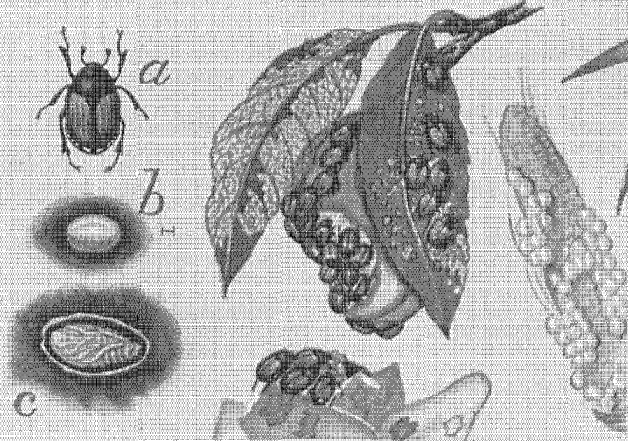
ranging from aphids to Japanese beetles. He can get it in a single package labeled Du Pont Vegetable Garden Dust. Sprayed or dusted on vegetables weekly and after heavy rains, the product guards against an arm-long list of common insects and diseases.

PROTECTION FOR TOMATOES

For the gardener who confines his vegetable raising to a few tomato plants, there's Du Pont Tomato Dust, a less expensive compound containing both insecticide and fungicide. It's effective against tomato fruitworm, early and late blight, and several other pests that attack the vine.

A third combination product, Du Pont Fruit Tree Spray, offers multiple protection for apple, cherry, plum, peach, pear and quince trees, as well as strawberry, currant and gooseberry bushes. It controls, for example, the codling moth and plum curculio—the villains responsible for wormy apples. At the same time it protects the fruit against disfiguring apple scab and other diseases.

If you grow roses you're familiar with black spot, a fungus that kills off the leaves and saps the vigor of the bush. This and similar diseases afflicting at least 19 popular flowers, plus more than a dozen flower-destroying insects, are controlled by Du Pont Floral Dust. Like Vegetable Garden Dust and Tomato Dust, Floral Dust is water-dispersible and can be either dusted or sprayed.



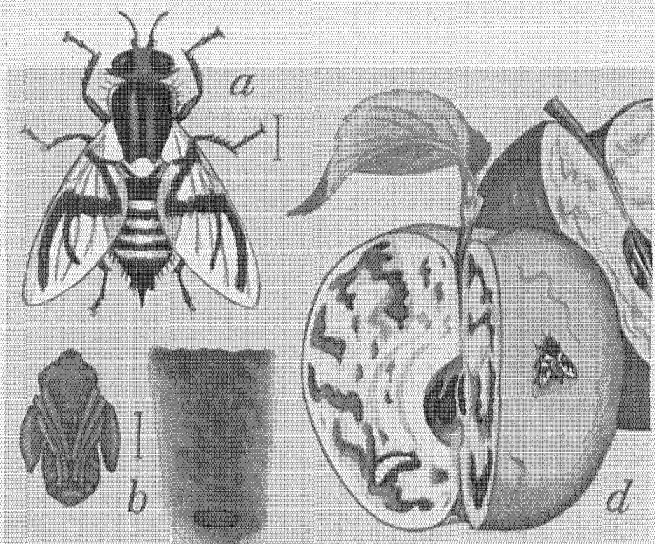
First spotted in the U.S. in 1916, the Japanese beetle is a major pest. Shown are the adult, pupa and egg. Vegetable Garden Dust is one recommended control.

One important point to remember about all these garden chemicals: they're at their best preventing plant damage rather than curing it. Black spot, for example, is spread by millions of tiny spores. The way to guard against the spores getting a toe hold on leaves is to lay down a protective coating of Floral Dust before they strike.

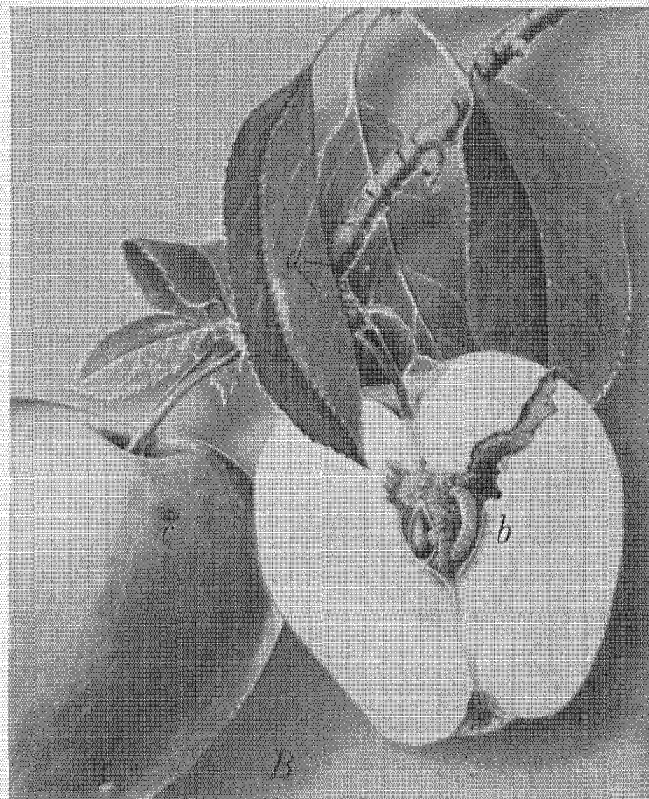
The same is true of insects like the curculio. Once this ugly customer has plunged its hooked beak into a growing apple and laid eggs in the incision, the apple is doomed to fall prematurely. What's needed is a protective coating of Fruit Tree Spray that kills the curculio before it goes to work.

A cardinal rule is to spray or dust early—before diseases show up and before insects are numerous—and regularly thereafter. Then you'll be able to paraphrase Joel something like this:

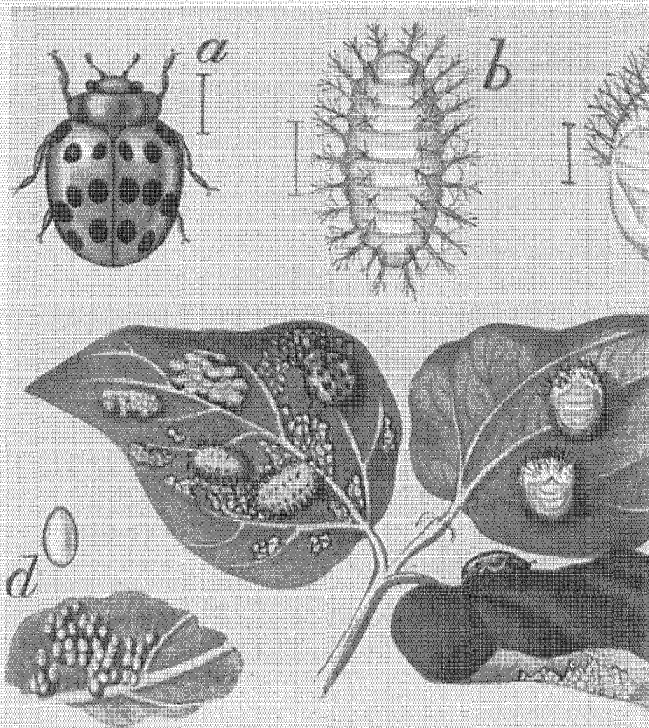
"That which the plant pests left have I harvested; and, verily, the lion's share was mine."



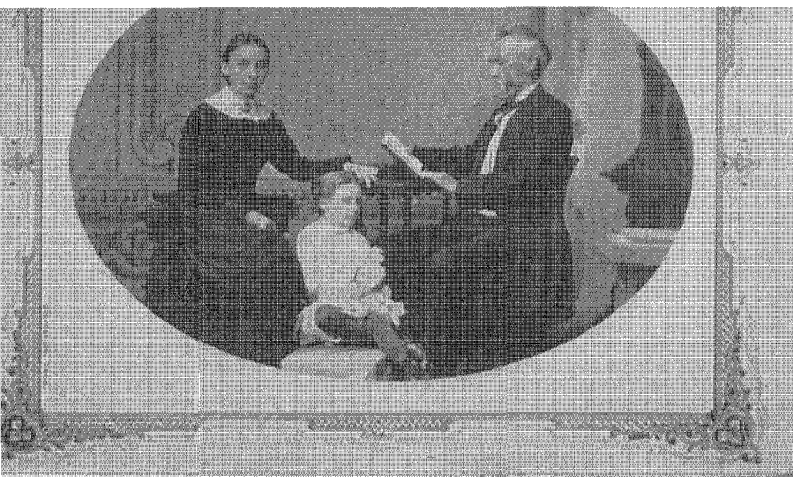
This fly punctures apples to lay its eggs. Apple maggots, or railroad worms, hatch and tunnel inside the fruit, as shown. Du Pont Fruit Tree Spray is an effective control.



The codling moth, or appleworm, lays its eggs (a) on fruit or leaves. Larva (b) hatches and eats into apple, leaving "sting" (c). Fruit Tree Spray gives protection.



Spraying or dusting under leaves controls this prolific pest, the Mexican bean beetle, shown here in all its life stages. Fond of beans, it likes limas best.



The James Larkins. Few prints of '70s are so well preserved.



Restoration work requires expert photographic and artistic skills.

New prints from old

By JAY H. MACKEY

The oldest story in the photo restoration business is about the woman who went to a local studio to have an ancient snapshot of her deceased husband made into a portrait.

"And take the hat off, please, because he had such nice hair," she requested.

The photographer said this they could do, and asked, "How did your husband part his hair?"

"What a silly question," she snapped, "you'll see for yourself when you take off the hat."

Photo restorers tell me this story is only a slight exaggeration. Actually there are few limitations to their photographic and artistic skills when it comes to making a new print from a faded or damaged photograph.

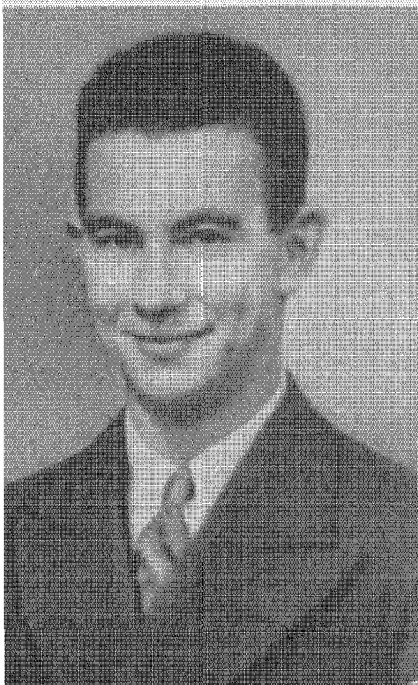
Representative of the established leaders in this

business is 75-year-old Sprague-Hathaway, Inc., of West Somerville, a Boston suburb. Sprague-Hathaway is primarily a wholesaler and retailer of photographic skills. The company doesn't take pictures—yet it handles some of the toughest photographic assignments imaginable. Take a look, if you haven't already done it, at examples of its work on these two pages.

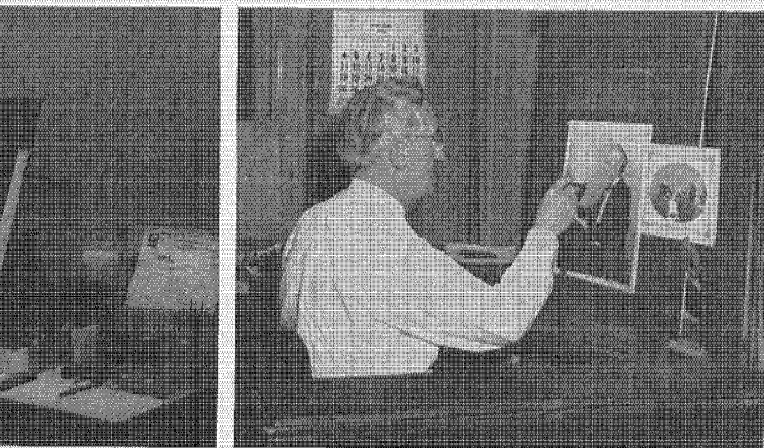
In reminiscing on his company's early days, vice-president J. H. C. Reader said not only were the old processes—daguerreotypes, ambrotypes, tintypes—as different from those of today as "chalk is from cheese," but that the whole idea of what a portrait should be has changed.

"In the 1800s a large crayon portrait of Grandma and Grandpa in the parlor was a must," he said. "Not much attention was paid to likeness, and except for the beards and mustaches the men looked almost identical. Attention was focused on clothes and background. Today, the opposite is true. Likeness is of most importance in reproduction of copies."

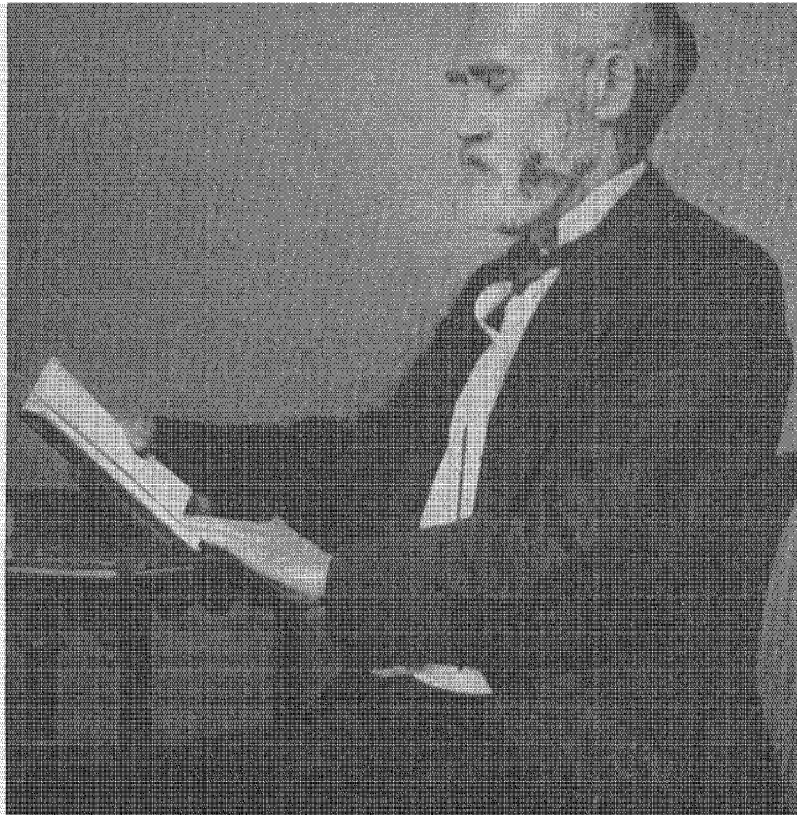
Getting likeness into a moth-eaten old print is often quite an order. "Moth-eaten" is literally true, for prints chewed by insects turn up at photo restorers' all the time. And so do those that have been torn,



Sprague-Hathaway makes many portraits from snapshots, using Du Pont "X-F" ortho film and "Velour Black" photographic enlarging paper.



To make portrait at right, copy negative of original print is made, retouched and printed. Artist then adds final retouching to print.



charred in fires, soaked by floods, decorated by children, and faded with age.

On top of this, photographers and artists have the problem of making new portraits and prints without in any way altering the original submitted to them. At least 90 per cent are especially treasured because the persons pictured are dead.

To make a print, Sprague-Hathaway follows a definite procedure. First a copy negative is shot of the desired portion of the original, usually on Du Pont "X-F" ortho photographic film, and a proof is printed to serve as a guide for likeness during the entire finishing process. Following this, an artist retouches the copy negative to eliminate the dark spots such as burns or stains that showed on the original, and removes undesirable backgrounds.

An enlargement on Du Pont "Velour Black" photographic enlarging paper (DL surface)—running in size up to 24 by 30 inches depending on the customer's order—is then printed from the retouched copy negative. Other skilled artists airbrush out light spots such as tears or scraped areas, add new backgrounds, and spray the completed print with a preservative before framing and shipping it.

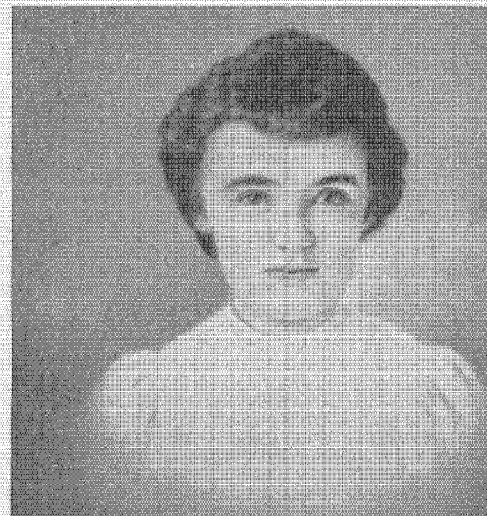
"We figure two things account for the present boom in our business," Reader said: "the greater photo consciousness spread by amateur photography, America's third most popular hobby, and improved techniques in making old prints."

"Over the years," he said, "we have continued to

recommend sepia portraits because of their warmth and nearness in color to that of most originals. Requests for quality miniatures we put on Du Pont 'Ivora' sensitized white photographic film. For customers who want their portrait to have the appearance of a free-hand oil painting, we color Du Pont's photo-sensitized canvas. 'Velour Black' paper also suits our purpose for color work, and its accurate reproduction of both light and dark tones earns it our black-and-white print and portrait business.

"Things not only are humming around here," he added, "they're interesting enough to keep a man young. Our studio has just reconstructed a portrait of an old crayon bust which had served as a rifle target for two sharpshooting youngsters. We did a good job, I'm glad to say, because the mother was quite upset that her boys should be so inconsiderate of their deceased grandfather's picture. Which reminds me . . . have you heard the story about the lady who wanted a portrait of her deceased husband . . .?"

"For customers who want their portraits to have the appearance of free-hand paintings, we color Du Pont's photo-sensitized canvas."





A Lowry Co. truck fender is sanded in preparation for refinishing. The firm specifies "Dulux" for its fleet.

Rolling billboards



These days, many a trade-mark travels by truck.

*It's the job of "Dulux" enamel
to keep it "see-worthy"*

By J. RICHARD KELLY

CORAL GABLES, FLORIDA.

Each year 3,000,000 or so tourists range themselves along Florida's beaches in various stages of undress to soak up the sunshine and drink in the salt air, two of the state's finest natural resources.

As a Floridian, James R. Lowry is proud of his

state's climate, but as a businessman—president and general manager of the Lowry Electric Co. here—he's forced to take a practical view.

"Sure," as Lowry said, "salt spray and sun have caused us truck-finishing headaches, but that's like complaining about harp music in heaven. The climate is what brings business down here. Besides, we've got most of our rust problems licked. Let Bill Morris tell you how we did it."

Bill Morris, purchasing agent, told us that rust and corrosion of truck finishes had indeed been a major headache. Thirty-six Lowry trucks are on the road daily, he said, and are parked outside every night. They carry electrical equipment and supplies up and down the coast, from Key West to points 200 miles north of Miami. The climate gets in its licks on each and every mile.

Until 1950, Morris said, maintenance of the paint job on the trucks was a constant battle. Seldom did the vehicles look as good as the company wanted them to. It was then that Lowry launched a thorough study of the finishing systems and materials that had stood up best under the Florida sun.

Out of the investigation came a new standardized plan for fleet maintenance. Instead of farming out refinish jobs to a number of shops, as before, Lowry contracted with Adam's Garage in Coral Gables to handle all the work. "Dulux" enamel was specified for the top coat, and other Du Pont refinishing materials for the preparatory steps. In addition, washing and polishing were scheduled on a regular basis.

The result, according to Morris, is that the trucks now look better longer, representing a substantial saving in time and money. "Our original schedule called for a repaint job every two years," he says, "but that hasn't been necessary. The only mars on the trucks so far are from traffic damage."

There are less expensive finishing materials than those made by Du Pont. But Lowry looks at it in the same light as the woman who said she couldn't afford

to buy cheap clothes. Materials, he's found, represent only about 20 per cent and labor 80 per cent of painting cost. It doesn't make sense to use low-quality finishes which can cause shop tie-ups. Paying a little more for materials is more than offset by savings in the added road life of the finish.

Like Lowry, operators of many big cross-country and regional fleets have also found that quality finishes more than pay for themselves. One factor is hard to measure, but nonetheless tangible: the matter of smart appearance. The public looking at a truck can't help seeing it as a reflection of the company it represents. Trucks and busses are rolling billboards for their owners, in many cases carrying sales slogans and company trade-marks.

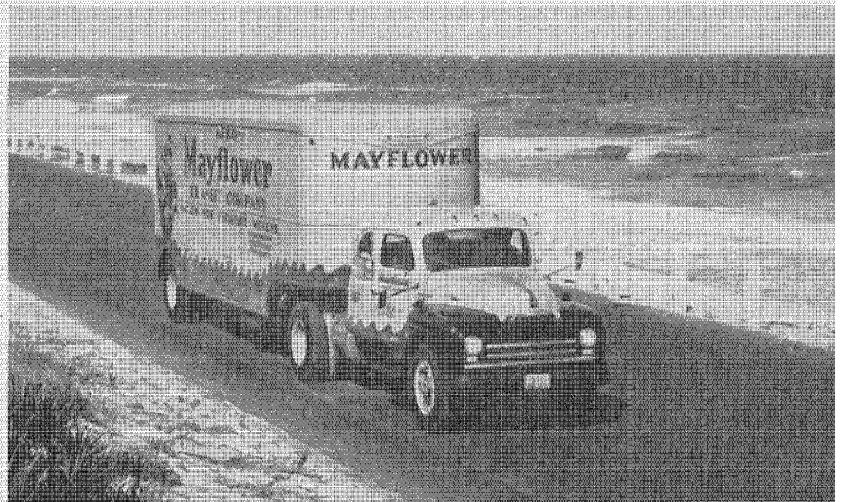
APPEARANCE PLUS CONVENIENCE

With large and small fleets alike, the need for a good appearance is only one side of the finishing story. The material must also be easy to apply, since time spent in the refinish shop costs money. "Dulux" enamel goes on smoothly, has excellent hiding qualities, and dries fast to a brilliant gloss without rubbing—characteristics that help get jobs done faster.

At the Denver-Chicago Trucking Co. in Chicago, for instance, the maintenance shop crew is responsible for keeping 1,328 cross-country units in operation. Sixteen years ago, W. J. Robinson, president and general manager of the firm, picked "Dulux" enamel to do the job. He has this to say: "We have had a long and very satisfactory experience in the use of Du Pont refinish materials. They keep our fleet looking bright, shiny and new."

Each batch and color of "Dulux" proves itself in the laboratory before going to customers, but it's still gratifying to hear testimony of this sort from the men actually responsible for keeping trucks on the road. Under the Florida sun or through a Chicago winter, "Dulux" plays an important part in keeping the billboards rolling.

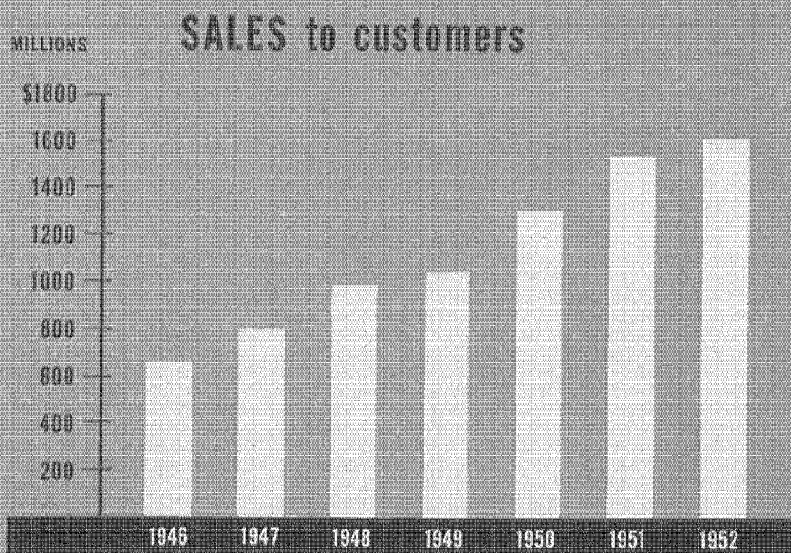
Trucks are rolling trade-marks for American business. A good-looking finish helps make a good impression.





Report on our 150TH year

*Highlights of President Greenewalt's 1952 annual statement
to stockholders of special interest to Du Pont customers*

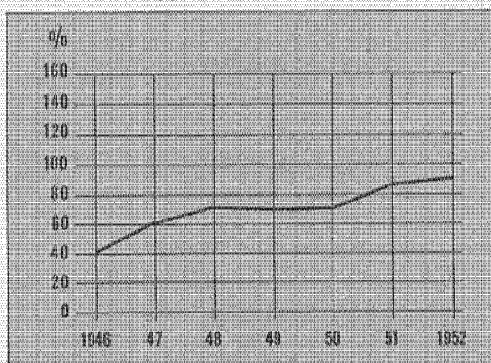


This report summarizes the activities of the Du Pont Company for 1952.

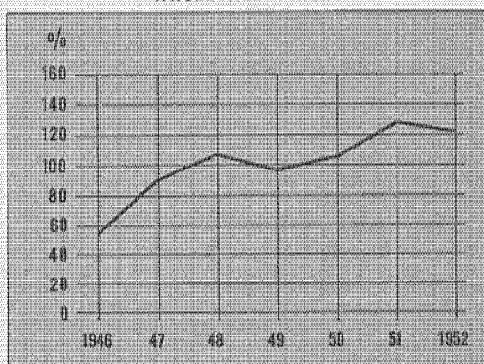
Sales reached a new high of \$1,602 million—five per cent above 1951's record total. More sales of newer products, resulting from recent plant expansions, were responsible for the rise, and more than offset declines in some older product lines.

The Company's sales price index was about the same as last year. Foreign customers, as in 1951, accounted for six per cent of total sales.

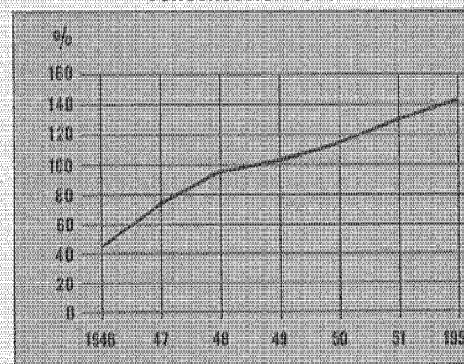
CONSUMER PRICES



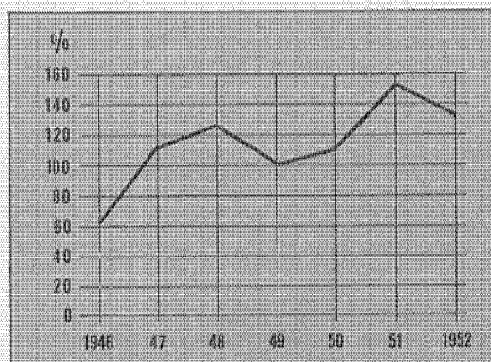
WHOLESALE PRICES



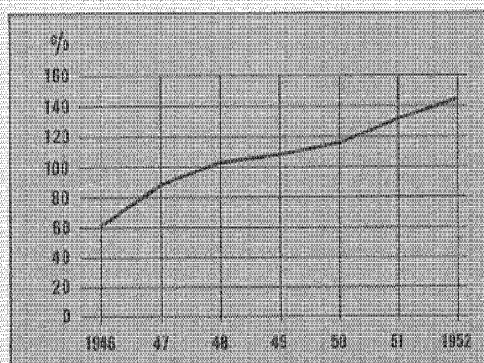
CONSTRUCTION COSTS



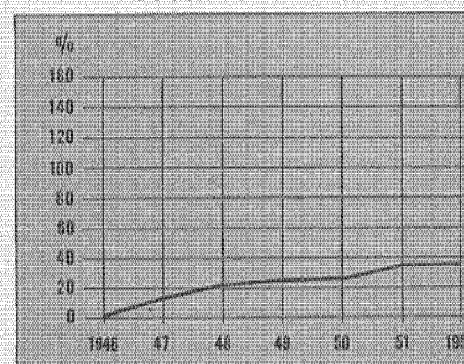
RAW MATERIALS DU PONT BUYS



DU PONT AVERAGE WEEKLY WAGE



DU PONT SALES PRICES



PRICE AND WAGE TRENDS from 1946 to 1952 as per cent change from 1939. These are annual averages.

EARNINGS AND DIVIDENDS

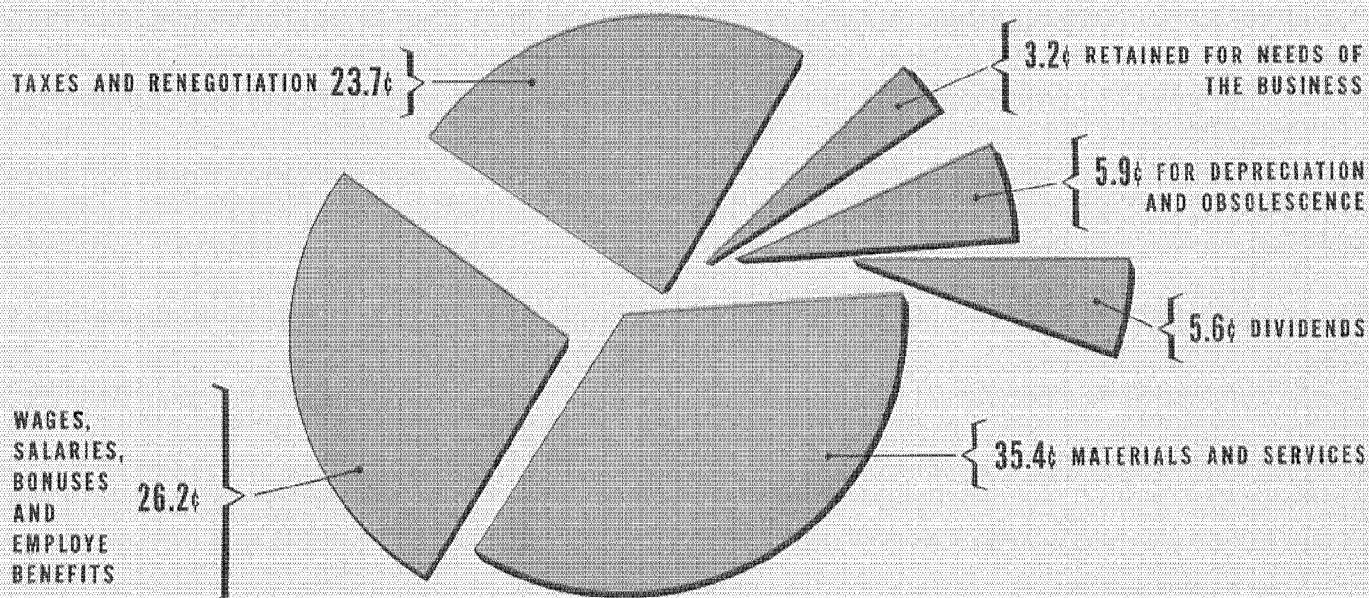
Earnings from Du Pont sources before taxes equaled 1951's record \$11.10 per share. After taxes on income of \$8.03 a share, net earnings of \$3.07 were left. This was six cents more than in 1951.

While earnings from operations after taxes were about the same as in 1951, average operating invest-

ment increased ten per cent. Net operating earnings as a percentage of operating investment, therefore, decreased from 9.0 per cent to 8.3.

Dividends per share of common stock totaled \$3.55, and the year-end dividend was the 193rd consecutive quarterly dividend paid. Total dividends were \$172 million, 77 per cent of net income for the year.

WHERE THE CUSTOMER'S DOLLAR WENT IN 1952

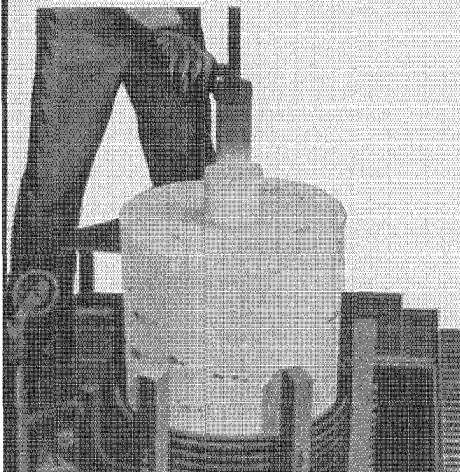


The Company spent \$126 million to build new plants and to expand or improve others. This compares with \$135 million in 1951.

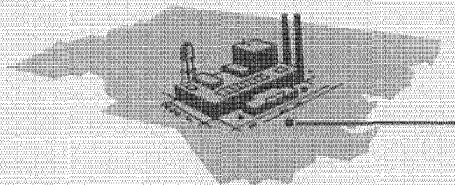
Substantial sums were spent on projects for "Dacron" polyester fiber, "Orlon" acrylic fiber in

sodium cyanide, dynamite, tetraethyl lead, sulfuric acid, and cellulose sponges.

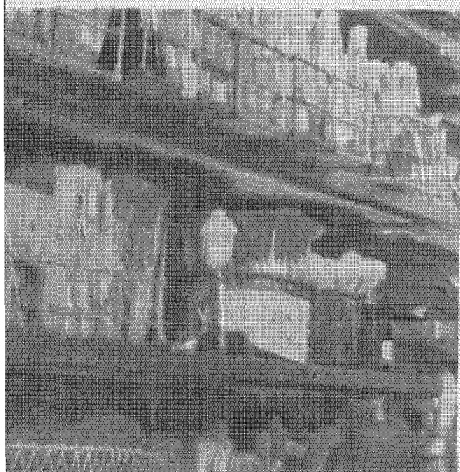
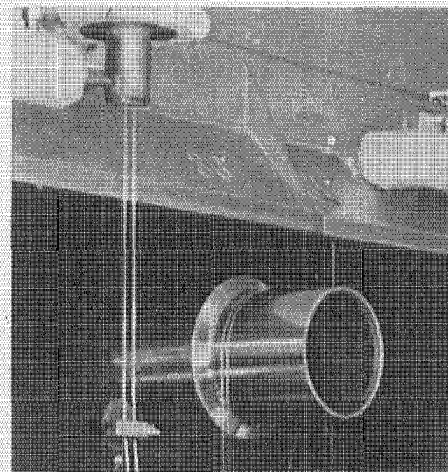
The plant for producing "Orlon" staple at Camden, S. C. started up in May and reached full production by year-end. The new cellulose sponge plant



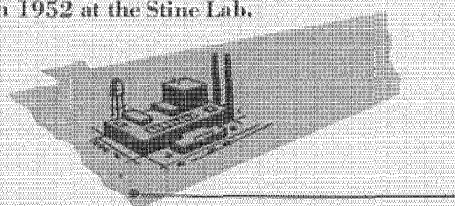
RESEARCH on titanium metal, in which Du Pont has pioneered, was carried forward in 1952.



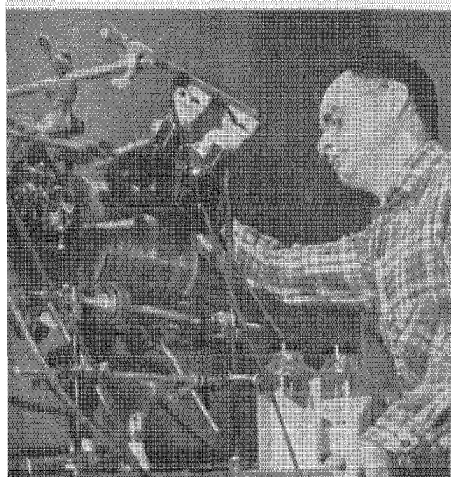
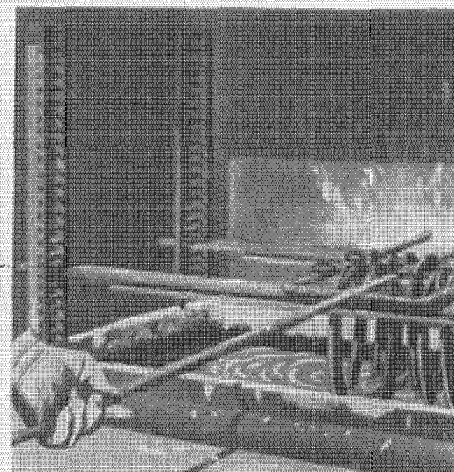
A NEW PLANT at Kinston for production of "Dacron" will begin manufacture this year.



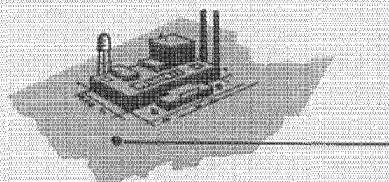
RESEARCH on feed supplements and animal remedies was begun in 1952 at the Stine Lab.



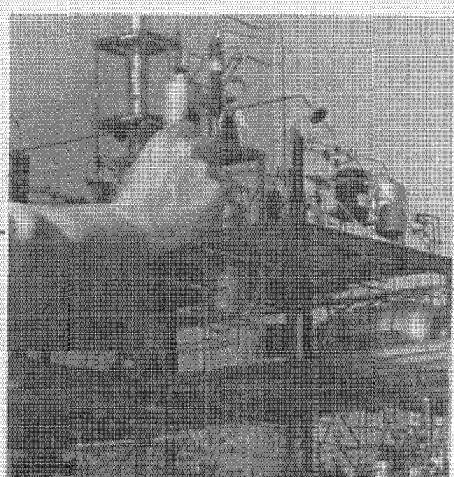
AT MEMPHIS, output of sodium cyanide has begun, while hydrogen peroxide is due this year.



RESEARCH led to new modifications of silica which are now being evaluated for various uses.



A NEW PRODUCT, "Mylar", is to be manufactured in a plant being built near Circleville.



at Columbia, Tenn. began operating in November. Three other new plants are nearing completion. The plant for making "Dacron" at Kinston, N. C. and a dynamite plant at Martinsburg, W. Va. are scheduled to begin operation early in 1953. Martinsburg's dynamite facilities will replace those at Gibbstown, N. J. The Gibbstown plant will now be used chiefly for chemical manufacture. At Memphis, Tenn. sodium cyanide production started in October, and production of hydrogen peroxide will begin in mid-1953.

Two additional plants are planned. One, near Circleville, Ohio, will make transparent "Mylar" polyester film. The other, near Beaumont, Tex., will manufacture organic chemicals. Production will start with methionine, a poultry feed supplement.

RESEARCH

During the Company's entire history, research has been the essential basis for sound and healthy growth. More recently emphasis has been on research programs that would lead to diversification by developing new products and processes. So successful have these efforts been that the many products brought to the market in the past 25 years now account for more than half of Du Pont's sales.

A fruitful area of new opportunities has been the field of synthetic organic polymers. The wholly synthetic textile fibers—nylon, "Orlon" and "Dacron"—are results of such research. Recently investigations in the same field have led to tough "Mylar" polyester film. Its unusual properties are expected to open new markets in electrical and other industrial uses. Another development of polymer research is polytetrafluoroethylene which has extraordinary chemical resistance and electrical insulation qualities.

Emphasis on inorganic chemistry is being increased. An example is the Company's pioneering production effort with titanium. Research and devel-

opment have been active on this strong, lightweight, and corrosion-resistant metal. More recently new modifications of silica have been discovered and are now being tested for various uses.

Another field of Du Pont activity is that of biochemical research on feed supplements and remedies for use in animal husbandry.

The new Stine Laboratory at Newark, Del. is equipped with specialized facilities for an integrated long-range approach to this work. The development is a logical outgrowth of our long-established interest in agricultural chemicals such as fertilizer compounds, seed disinfectants, weed killers, and pesticides.

The Haskell Laboratory of Industrial Toxicology will move to new and larger facilities in mid-1953. Research in this Laboratory is concerned with safeguarding employees and customers from potential hazards in the manufacture and use of Du Pont products.

A new laboratory consolidating some textile research activities is being built near Wilmington. It will be used in the evaluation of new fibers and the improvement of existing ones. The new laboratory will also provide facilities for improved service to customers and for research on all textile operations, including finishing and dyeing.

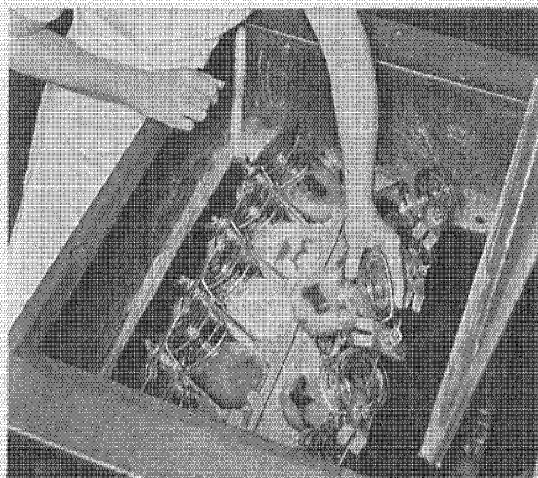
Research expenditures in 1952 were \$52 million, an increase of \$5 million over the previous year. Construction costs are not included in this figure.

EMPLOYEES AND STOCKHOLDERS

Employees at the year-end, excluding those at Government-owned plants, numbered 90,834, including 16,516 women. Employees at Government-owned plants numbered 30,824.

There were 142,744 stockholders at the year-end, an increase of 4,576 during the year. All of the increase was in common stockholders, who numbered 126,565. Preferred stockholders numbered 22,936.

Production facilities for vat dyes, shown here undergoing fastness test, were expanded in '52.



Capacity for acetate fiber output also was increased last year. Du Pont spent \$126 million in '52 on new plants and expansion of existing ones.



ANTITRUST LITIGATION

No new antitrust actions were brought against the Company by the Department of Justice in 1952. Of the five cases pending at the beginning of the year, one has been concluded and another voluntarily dropped by the Government.

I.C.I. Case—In July, the Federal District Court in New York City entered a final judgment in this case. The court set aside the Company's agreements of many years' standing with Imperial Chemical Industries Ltd. for the granting and receiving of patent and process rights, and ordered that its joint ownership with I.C.I. of companies in Canada, Argentina, and Brazil be terminated.

Under the judgment, certain U. S. patents applied for or issued to the Company prior to June 30, 1950, and related improvement patents applied for or issued prior to June 30, 1955, are subject to compulsory licensing on a nonexclusive basis at reasonable royalties.

While patents covering the manufacture of several major products such as nylon and sodium are included, the judgment does not require compulsory licensing of patents on other major products such as rayon, cellophane, titanium pigments, and tetraethyl lead.

In January 1953, plans were submitted to the Court for ending Du Pont-I.C.I. joint ownership in Canadian Industries, Ltd., Industrias Químicas Argentinas "Duperial" S.A. Industrial y Comercial, and Industrias Químicas Brasileiras "Duperial" S.A. These plans provide for corporate reorganizations to suitably divide the business and properties of each of the three companies so that neither Du Pont nor I.C.I. would own stock in the same company.

Wood Finishes Case—On December 2, the Department of Justice withdrew the criminal antitrust action instituted against the Company in 1948. The Company and other defendants had been charged with conspiring to fix prices, discounts, and terms of sale on wood finishes. The other defendant companies previously had paid fines without contesting the charge.

Cellophane Case—Trial of this case, in which the Company is charged with monopoly in the manufacture and sale of cellophane and cellulose caps and bands, was completed in January 1953. A decision is now awaited.

General Motors et al. Case—In this case the Government seeks, among other things, to compel the Company to dispose of its investment in the common stock of General Motors Corp. Trial began on November 18, 1952. It is probable that the trial will extend well into 1953.

Brake Fluid Case—No trial date has been set for this case which involves charges that the Company and other defendants conspired to restrain trade in automotive and other braking systems.

NATIONAL DEFENSE

Atomic Energy Project—The Savannah River plant is now in its third year of construction. The Atomic Energy Commission requested the Company to design, build, and operate it.

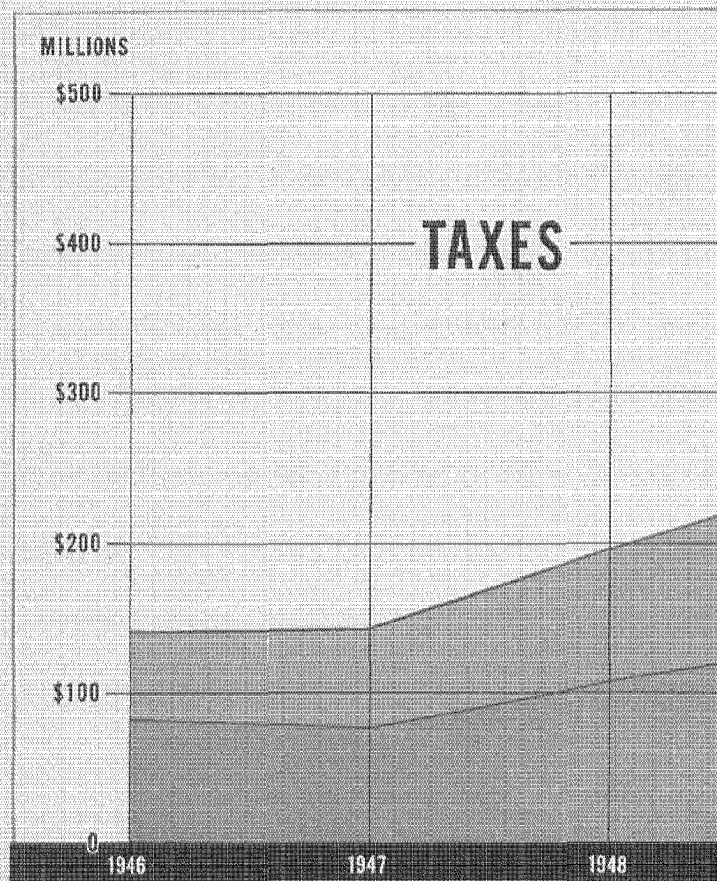
This is one of the largest industrial projects ever attempted. The project, for example, calls for 126,000 carloads of construction materials, the equivalent of a train 940 miles long.

Much pioneering technical work is involved in previously uncharted fields. Some 1,200 technical and supervisory personnel, most of them transferred from Du Pont's commercial operations, are already on the job as the nucleus of the future operating force.

Other Defense Activities—Sales for defense purposes were substantial, but not large in relation to total sales. Products in greatest demand were nylon yarn and staple, nylon molding powder, tetraethyl lead, and titanium metal. To cite an unusual application, nylon fiber is being used for armored garments to save lives in Korea.

At the request of the Defense Materials Procurement Agency, the Company contracted to expand its titanium metal sponge production, nearly all of which is being used for defense.

All of the military smokeless powder facilities at Indiana Ordnance Works, Charlestown, Ind. are being reactivated under terms of a contract with the Army. A portion of the plant is now operating.



TAXES

The Company's estimate of Federal taxes on income, and renegotiation, is \$370 million. This compares with \$371 million in 1951, and is equal to 89 per cent of total salaries and wages paid to employees other than those at Government-owned plants.

During eight and one-half of the last 13 years, American corporations have been subjected to a so-called "excess profits" tax. It is often rationalized as a tax to stop war profiteering. The fact is, however, that profits on defense contracts are effectively limited by the Renegotiation Act, under which earnings on direct and indirect sales to the Government are held to a percentage of sales determined by the Renegotiation Board.

No exception can be taken to the objective of placing the defense program as nearly as possible on a pay-as-you-go basis. It is of paramount importance, however, that the additional revenue raised is not offset by limitations imposed upon industrial activity.

The normal tax rate is now 52 per cent. The "excess profits" tax imposed on top of this normal tax results in rates as high as 82 per cent on earnings from Du Pont's new plants and processes. This sharply reduces profits, but beyond that it reduces both the funds for reinvestment and the incentive to invest; all are essential to industrial growth. Industrial growth means new products of benefit to the consumer, high employment levels, and advancing technology which brings lower prices and better quality. These are mat-

ters directly affecting the welfare of all.

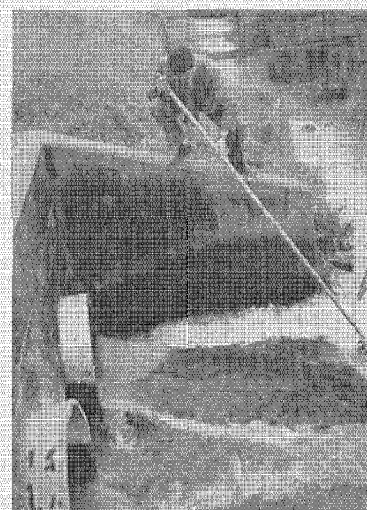
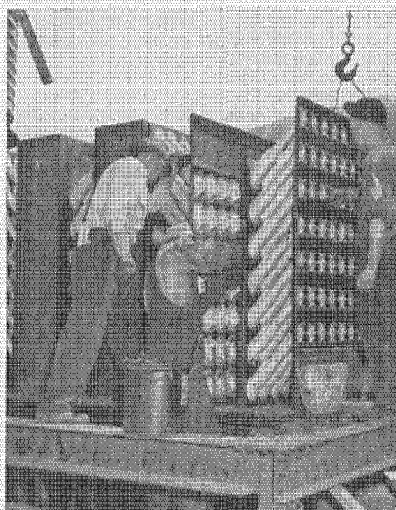
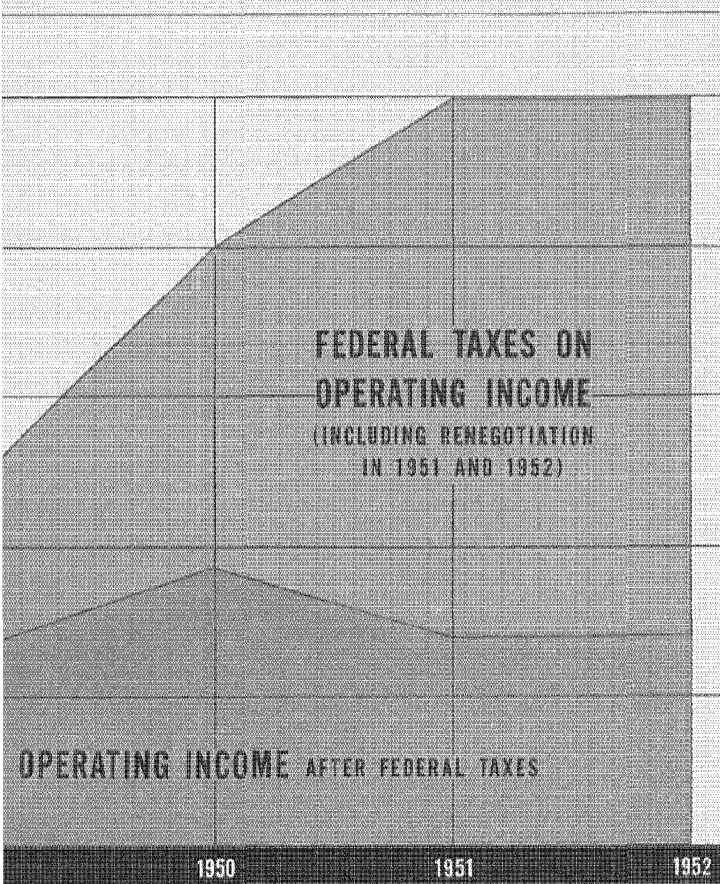
The "excess profits" tax, by striking at rewards for new developments, penalizes growth and efficiency at the very time when these factors are most needed for the national security and the maintenance of civilian living standards. By penalizing profits, it tends to subsidize and encourage inefficiency and wastefulness.

These effects are not especially noticeable to the public over a short term. They would, however, become painfully apparent to the consumer, as well as the investor, if long continued. This form of taxation, therefore, is an unsound, self-defeating method of raising revenue, and it is hoped that the law will be permitted to expire this June, as scheduled.

COMMUNITY RELATIONS

Du Pont has plants and sales offices throughout the country. It now operates 73 plants in 26 states, and maintains branch offices and warehouses at many other locations. The Company, to be successful, must conduct its business in a way that will enlist community support and cooperation.

Mutual interest is self-evident. Company payrolls, purchases, and dividends enter into the local economy. In return, the community provides employees, suppliers, and customers. Adequate wages and good working conditions, together with the Company's safety program, are important factors in identifying Du Pont as a desirable employer.



POLLUTION CONTROL: Installing fly-ash catcher at rayon plant, left, and sampling waste water at the Waynesboro acetate plant.

Careful attention is paid also to the disposal of waste into the air and streams. The Company has invested or authorized approximately \$29 million in equipment to control pollution. As a matter of policy, no new plant construction is authorized without making provision for minimizing pollution. Some difficult problems still exist at older plants, but continuing effort is being made to find satisfactory solutions.

Focal-point painting is turning dingy industrial plants into...

Well-dressed neighbors

By MARY MONROE and MICHAEL WOLF

A completely new approach to plant-exterior finishing is in the wind these days. Called focal-point painting, it's the product of cooperation between Du Pont and several of its important customers—among them

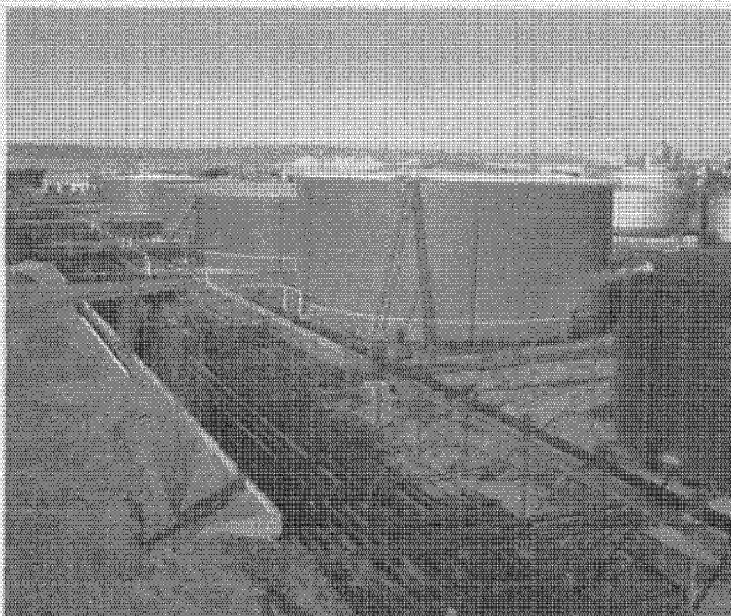
exterior enamels, with built-in gloss, brilliance and durability. For several years now, Du Pont researchers, cooperating with Phillips, have been testing these finishes in the laboratory, in the field, and in actual Phillips installations.



BEFORE. "Companies like Phillips Petroleum have realized that a refinery, by nature, is no picture postcard subject."

the Phillips Petroleum Co.

The principle of focal-point painting is akin to camouflage, but with a different twist. It seeks to make a plant more attractive by using the ladies' age-old make-up technique: "Use colorful paints to attract attention to what's pretty so no one notices what isn't." It involves painting a few prominent buildings in startling, beautiful colors so that dismal equipment fades into the background. The paints used are "Dulux"



AFTER. Phillips and Du Pont have worked out focal-point painting program featuring the oil company's sales colors.

An oil refinery, of course, is not one of the prettiest customers ever to step into the industrial beauty parlor. Companies like Phillips have realized for a long time that a refinery, by nature, is no picture postcard subject. It may be a fairyland of clustered lights by night, but in naked daylight it's a drab mass of columns, pipes and towers.

The first Phillips refinery to be tackled by focal-point painting was the one at Kansas City, Kans.

Coats of "Dulux" recently went on the catalytic cracking unit, the storage tanks, polymerization unit, and pipes and columns. Since the refinery is visible to the public from so many places—much-traveled Fairfax Avenue, the nearby municipal airport, and the busy intercity trafficway over the Kaw River—the new painting technique is playing to an unusually large audience in greater Kansas City.

HOW TO WIN FRIENDS...

Why do folks like Phillips care about dressing up their plants? Well, in the first place, they like to be good neighbors. Relations between a community and its industries are happier when industrial sights are kept pleasant. Second, employees seem to take greater pride in their company when it's an attractive place to work. And third, there's the advertising angle. If a refinery is decorated in company colors, it's more likely that people passing by will keep the company's products in mind when they're shopping.

Phillips refinery men have long wanted to identify themselves with their company's service stations. Now they're doing it by using Phillips sales colors, as well

as the familiar orange-and-black shield, in the new painting program.

The program, as a by-product, has educational value. For in many industrial sections of cities, where one plant seems to merge with neighboring ones—or in the wide spaces of Oklahoma and Texas where refineries and gasoline plants are as commonplace and alike as faces in a crowd—the passer-by often doesn't know whose plant he's viewing. With focal-point painting, the doubt is removed.

Phillips hasn't gone into this thing halfway. It has given a face-lifting not only to its Kansas City refinery, but to others at Okmulgee, Okla., Phillips, Tex., and Woods Cross, Utah.

Oil companies don't expect to eliminate all the unattractive areas around a refinery, but they're very pleased with their beauty treatment. After all, the average person passing a refinery sees it for only a few seconds. If his eye picks out color in those few seconds, he's left with an impression of cleanliness and even attractiveness. Obviously, the city that can boast of that kind of industrial section is a city grateful to the companies that made it possible.

Focal-point painting uses colorful "Dulux" exterior enamel to draw attention to the attractive so no one notices what isn't.



Architects, home builders, and refrigeration engineers can tell you that a . . .

Cool front's coming

By R. J. WOODRUFF, Jr.

An architectural authority commented not so long ago that we house our people with a surer and kinder hand when they are at work than when they are at home.

Maybe so a few years ago. But as of mid-1953 that

and apartments, all this sounds completely utopian. To the haves—well, they say you have to live in it to really believe it.

To show how un-utopian the movement really is, one air-conditioning manufacturer reckons that his



Shell of house, complete with central air-conditioning unit, arrives by truck at a Kansas development. In 1952, 10,000 air-conditioned homes were built in the U.S. Outlook for '53: several times that many.

judgment, for our money, is a little harsh. We can point to mile upon square mile of new homes, a million a year of them since the war, that are home sweet comfortable home to millions of Americans.

Even low-priced homes, the ones they say are built by the mile and cut off at decent intervals, are what you'd call push-button miracles. And from all indications, we ain't seen nothing yet!

The biggest story in home living this year, as it was in 1952, is the boom in houses with built-in climate control: that is, steady, year-round temperature and humidity on which you, yourself, call the turn. To the have-nots, those of us without air-conditioned homes

dollar volume in home units has increased tenfold in two years' time. Put another way, it's estimated that some 500,000 American homes now have central or room air conditioning. And they're not all high-priced homes, either.

Five years ago, the prophets were saying that a central, mechanically operated refrigeration unit would shortly crack the "builder" house field—that is, the broad market of houses selling for \$12,500 and under. Such soothsaying was generally considered over-optimistic at the time.

But the cool front has come, as forecast. Starting in the South and Southwest two years ago, it moved

up into Ohio, turned east to the Atlantic seaboard, and spread into New England. The first sign that anything approaching a "boom" was underway came when a Dallas, Texas builder took the plunge a little over a year ago, and installed year-round air-conditioning units in 125 homes priced to sell at \$12,500. He sold the crop with hardly any effort. After that the stampede was on.

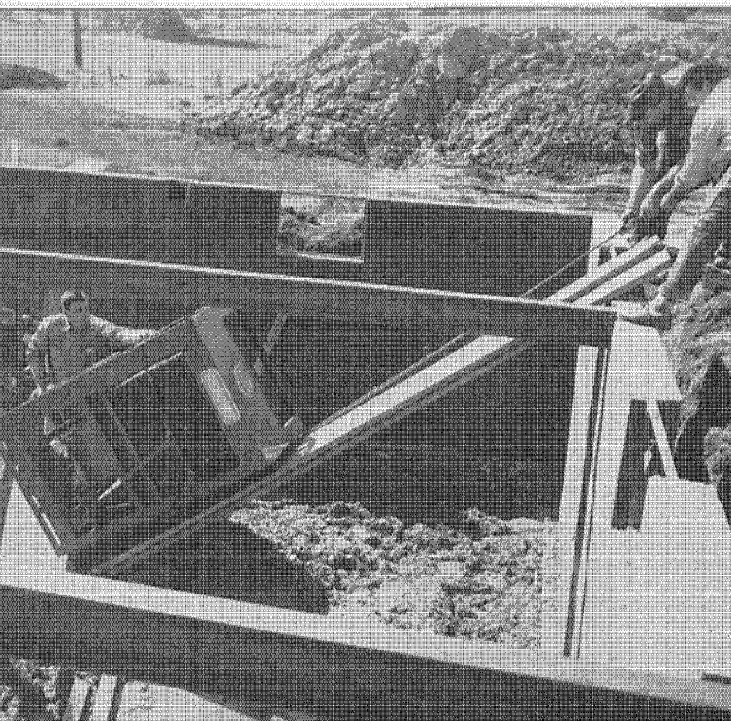
COSTS ARE ATTRACTIVE

Here's what the home buyer got: A constant 70° plus temperature all summer long from air that was cooled, dehumidified and cleaned. (In Dallas last summer there were 25 days when the thermometer went over 100°.) All winter the owner got the same temperature, using natural gas as a heat source in the same compact central unit. The unit cost \$1,500, but

rugs, slip covers, and the like are practically nil.

A combination of two factors gave birth to home air conditioning. As architects and builders were turning from the postwar "mass" building market to modern, functional living units, air-conditioning manufacturers were able to say: "Look, here's a small, compact, efficient combination unit that heats and cools and isn't a luxury item." The sum of these efforts is one of those miracles of modern-day living.

Du Pont had a hand in helping this cool front along. Almost all home air-conditioning units use "Freon-12" fluorinated hydrocarbon refrigerant. This is the odorless, nonflammable liquid which is the bloodstream of the refrigerating process. Now, "Freon-22", a new member of Du Pont's family of refrigerants, is coming up fast. The reason is that it permits the use of more compact units to give the same



Air conditioner is lowered away. The basement floor will be poured around unit later, after the house is erected.



Here's the completed house, one of 500. Projects like this illustrate trend to air conditioning in medium-price field.

added only \$1,000 to the cost of the house since a heating unit alone would have cost \$500.

Dallas engineers figured out the operating cost in this fashion: About \$93 for a year's electricity; \$40 for natural gas for winter heating; about \$1 per month for water, or a grand total of \$145, give or take a dollar or two. Comparable figures elsewhere would vary, of course; you might substitute oil heat for gas, for example. But these are the attractive economics of it.

Then there are allied benefits. You don't need storm windows, screens, attic or other fans. Southern housewives are enthusiastic about this. They say that with the house sealed tight, cleaning bills for drapes,

cooling capacity as "Freon-12". It will probably be the refrigerant as the cool front gains real momentum.

Will air conditioning be to the '50s what the TV boom was to the late '40s? You get all sorts of answers, including one which states that 1,600,000 homes will be partly or completely air conditioned by 1957. Last January 75,000,000 people saw President Eisenhower's inauguration on their TV screens. If you go strictly by the numbers, we suppose, home air conditioning will really have arrived when that many people are scientifically cooled in hot weather. From the looks of things it won't be in the next four or five years, but it isn't too far off at that.



Beating blight

... and other major tomato diseases is a job for new "Manzate", the shotgun fungicide

The growing season of 1952 was D-Day for a new attack waged by American tomato growers. The chiefs of staff: university and Du Pont researchers, state and federal experts, county agents, and farmers. The weapon: a new disease killer, "Manzate" fungicide. The objective: to prevent the major fungous diseases that develop on the leaves or fruit, lowering yields and

quality. Both tomatoes and potatoes are subject to diseases known as early and late blight. In addition, anthracnose and two leaf-spot diseases frequently take a toll of the tomato crop.

The fight is an old one, since plant diseases have been with us a long time. But it's new in one respect. You'd expect a conventional army to wield rifles, but in

These potato plants were severely hit by disease, but row at left treated with "Manzate" was saved.



'52 tomato growers found themselves toting a shotgun.

That's the best way to describe "Manzate", comparing it with older weapons against plant infections. One of the prewar fungus killers, for instance, is Du Pont "Zerlate". It's fine for certain fungi, but less effective against others. The result was that, during a single season, a tomato farmer might have a spray schedule something like this: two sprays of "Zerlate" fungicide, one of a copper-based fungicide, another later one with "Zerlate", then final copper treatment.

"Manzate", however, is a shotgun for five major fungous enemies of tomatoes. When you use it through the growing season, you don't need any other fungicide spray to control them. Field tests last year in dozens of areas from New Jersey to Hawaii confirmed this. Though results varied with climate, severity of disease, and method of application, enthusiasm for the product ran high.

At latest reports, "Manzate" had found fast friends among scores of agricultural experiment stations, county agents, food packers and farmers. Dr. E. M. Emmert, tomato specialist at the University of Kentucky, says that he rates the new chemical the best product in that area for tomato disease control for '52. In early-blight tests on potatoes in northern Indiana, "Manzate" also wound up at the top of the list.

And here's the key to the situation, as expressed by Charles Hartway who ships his tomatoes to large canneries in New York State. He says that "Manzate" simplifies his spraying program tremendously, since he can use one compound through the season instead of worrying about changing chemicals in midseason.

FUTURE USES STUDIED

Some research workers and growers have been experimenting with "Manzate" for apricots, celery, carrots, beans, onions, and other crops. Although the product is currently labeled for use on tomatoes and potatoes only, there's no telling what the future holds.

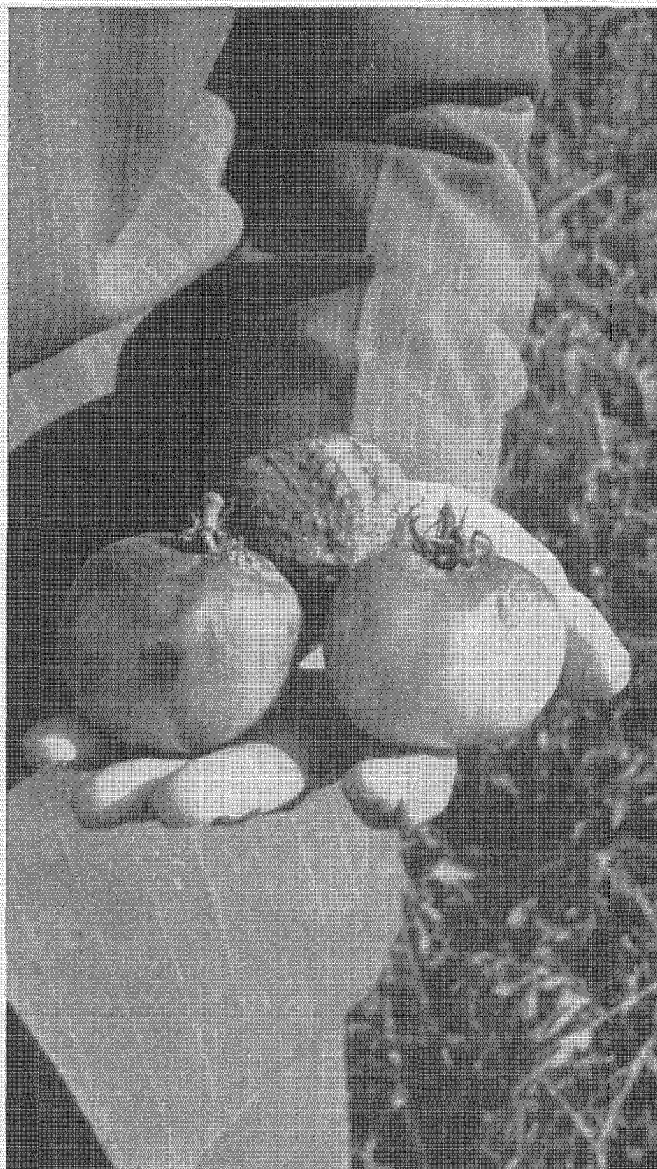
The warfare against fungi, of course, is nothing new to Du Pont. The Company is a manufacturer and supplier of "Parzate" zineb and nabam fungicides, "Zerlate" ziram fungicide, "Fermate" ferbam fungicide, and others as well. Actually, our experience in pioneering these products was responsible for the development of "Manzate". All of these chemicals belong to one clan of compounds, related to dithiocarbamic acid. "Manzate", which has been studied for more than five years, is the sixth in the series.

Even before Du Pont announced its decision to start commercial manufacture of this compound, several large food-packing companies were looking into it. Through their field research teams, they did a great deal of testing. Dr. S. G. Younkin, assistant research director for Campbell Soup, made one of the first comprehensive reports on "Manzate" when he presented his report on its use for tomatoes to a sectional meeting of the American Phytopathological Society in December 1951.

The question—"Will this chemical control tomato and potato diseases?"—is just one facet of the development program for this or any other new fungicide. Du Pont researchers and others must also answer questions like:

"Will plants be 'burned' by the chemical?"

"Will its residual effects be harmless to the public's health?"

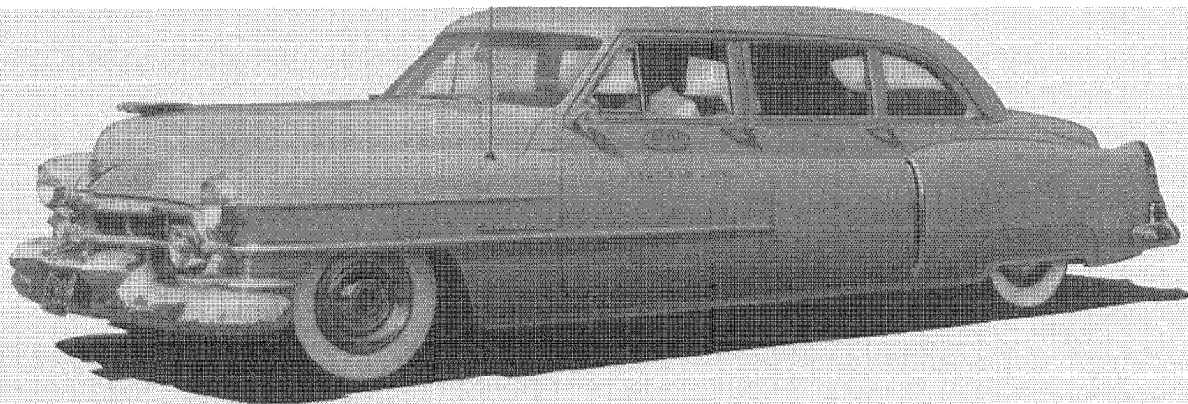


Taken in a grower's field in New Jersey, this picture documents three stages in tomato disease called late blight.

"Is it economical enough to be practical?"

"Can it be applied with the conventional field equipment that's available?"

All of this research, which seems to be coming up with satisfactory answers for "Manzate", is a routine part of seeing to it that the American public gets more and better food. As state after state gives the official nod to the new chemical, that goal inches closer.



Limousine to laboratory

The Du Pont Petroleum Chemicals Division has packed 1,600 pounds of research equipment into its newest and most complete test car

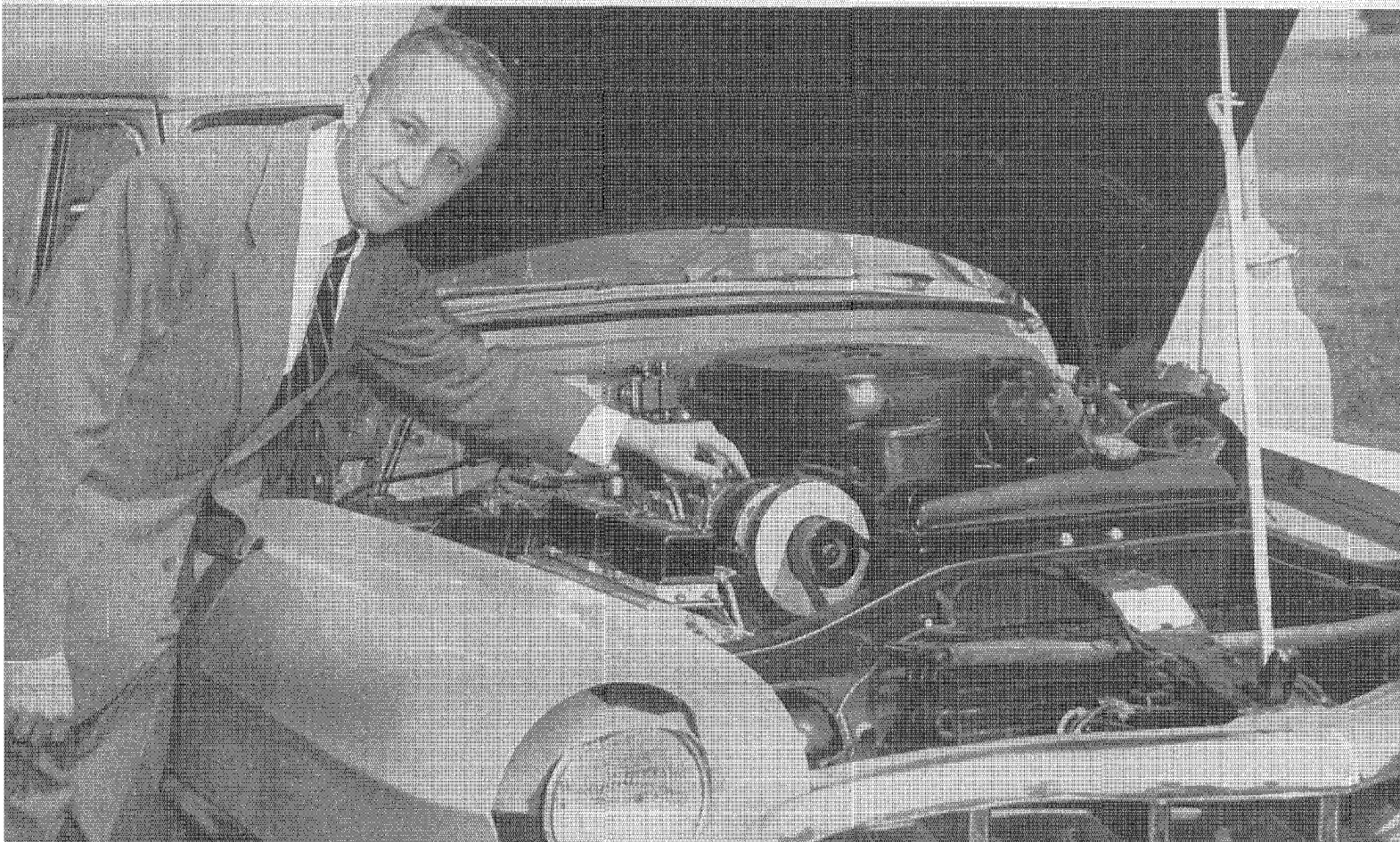
A Cadillac "75" has been turned into a rolling laboratory by the Du Pont Petroleum Chemicals Division. Equipped with the latest instruments for measuring the relationship between an auto engine and the fuel it uses, this car is the new flagship of a nationwide fleet of Du Pont test cars devoted to finding ways to improve gasoline chemically.

The Division chose a big car because it needed the space. What with all the electronic equipment,

extra tanks, pumps and other gear installed in the automobile, there's little room to spare. Even the familiar fishtails on the rear fenders have been used. One conceals an exhaust fan, the other an automatic fire extinguisher.

Two-thirds of the front seat was removed to make space for a console packed with computers and other electronic paraphernalia. Meters in the console record the car's spark advance, engine revolutions, horse-

Car has special 160 amp. generator, engineer John Rogers points out. Compressor for air conditioner is visible at right.



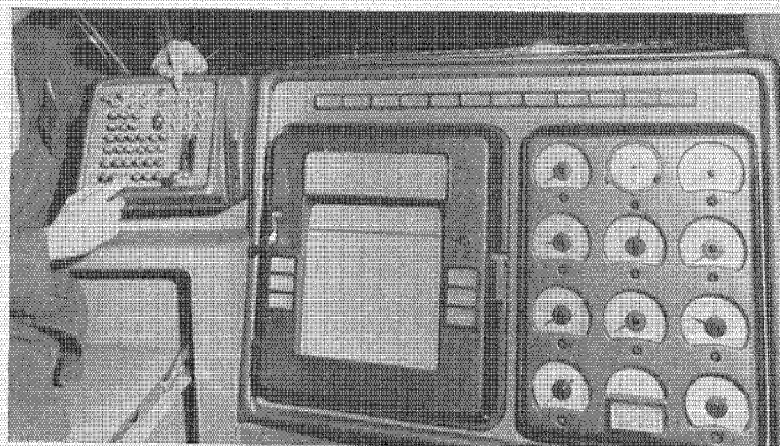
power and other data. One dial reports the temperature of the car interior, which is air-conditioned for comfort and so that windows can stay shut and keep out traffic noises. The outside air, radiator coolant, carburetor intake and engine oil temperatures are also recorded. Just push a button for the reading you want.

This business of engine temperature is important, the researchers point out. Every time the temperature in the cylinders goes up 20 degrees, the octane requirement of the engine jumps about three numbers. You can run a cool engine on low-octane satisfactorily, but the same gasoline causes knock as the engine heats up.

Like to know how many miles to the gallon you're getting at any given moment? Push another button in the new test car and read it on a dial. The figure is arrived at by dividing the car speed by the rate of fuel consumption—electronically, of course.

Speaking of gasoline, the test car offers a wide choice. In addition to the standard gas tank, there are 10 two-gallon containers in the luggage compartment. Each holds fuel of a different octane rating, ranging from 65 to 100. Any of the 11 fuels can be fed to the engine by pushbutton from inside the car. There's a vent pump to clear the carburetor before the new gasoline flows in.

Another unusual feature is a double axis recorder, the kind that can plot one value against another. With it, investigators can get what they call a "borderline fuel rating curve," the profile of a fuel's resistance to knocking at various engine speeds. Just as rising temperature definitely increases knock tendency, so does rapid acceleration.

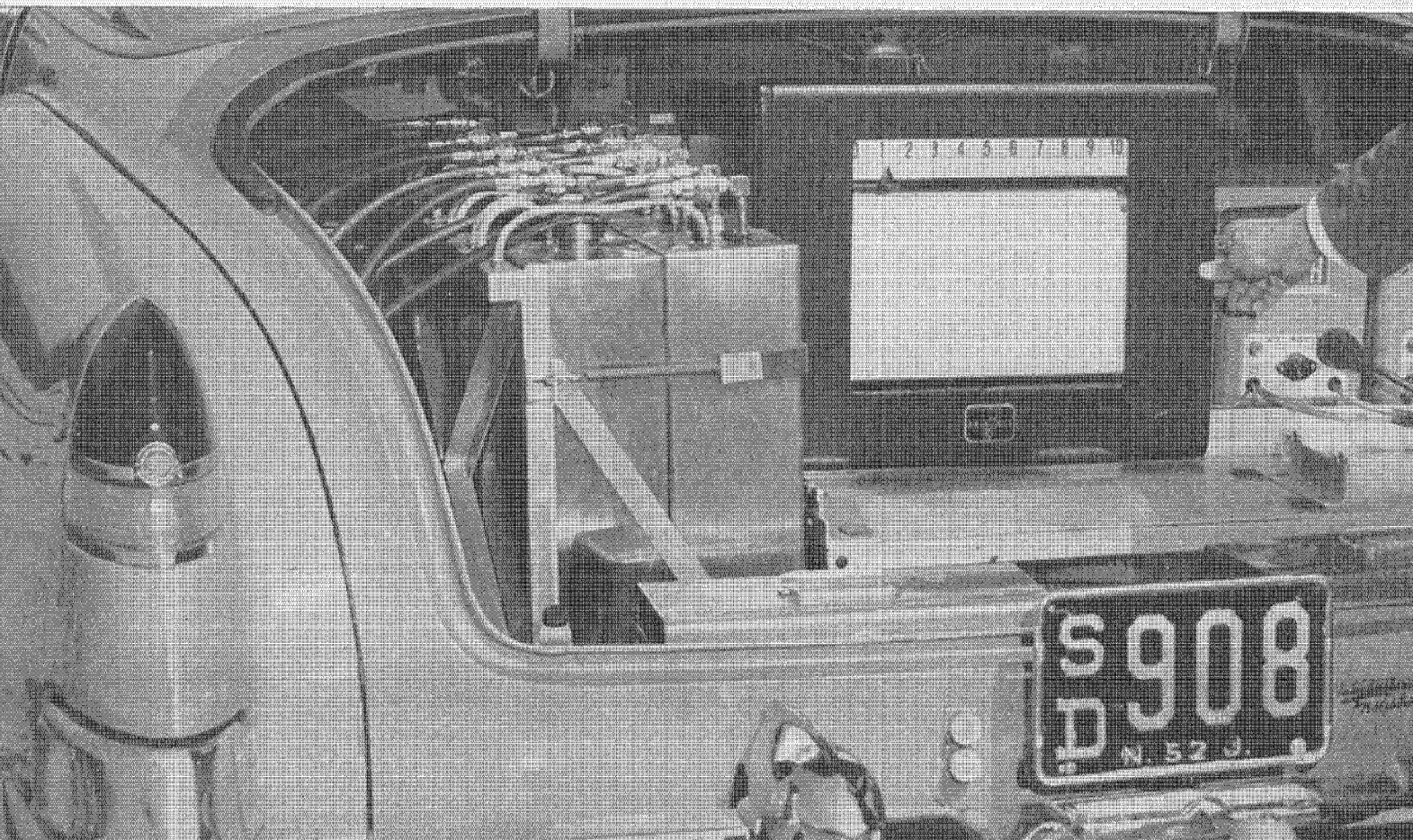


Rear seat view of the test car's control panel, graph recorder and instrument dials. Pushbuttons control fuel flow.

While the driver steps on the gas, his companion in the rear advances the ignition spark with a special control knob until the engine begins to knock. The knock is picked up by a microphone on the cylinder head, and amplified by a loud-speaker in the back seat. Meanwhile, the recorder plots spark setting against engine speed on graph paper. The result is the fuel rating curve.

As a producer of tetraethyl lead and other fuel additives, Du Pont constantly explores the complexities of fuel behavior. The new test car is just one more tool. Since oil refiners are seeking answers to the same questions, they will be invited to examine this laboratory on wheels when it tours the country this spring.

Ten two-gallon tanks in trunk contain fuel with varying octane ratings. Equipment in center computes horsepower and torque.



Wash-and-wear suits

Toss them in the washing machine, hang them up to dry

—here's one answer to easier summer living

Spencer Witty, sales head of the Witty Bros. clothing firm of New York's Sixth Avenue, has a favorite demonstration for callers at the company offices.

Grabbing a Witty tropical suit off the rack, he smooths the pants out on a desk and calmly pours India ink, iodine and perhaps catsup on the trouser leg before the visitor's eyes. The meeting then adjourns to the washroom—"my laboratory," Witty explains—where the pants are washed in warm water and detergent and hung up by the cuffs.

After a luncheon recess, Witty leads the way back to the washroom and throws open the door. There hang the trousers, nearly dry, spotlessly clean and still in press.

On Broadway, one of the same Witty suits is worn by a performer in the musical, "Wish You Were Here." During each show the actor is dumped fully clothed into a swimming pool. The suit dries out between performances, and the actor has worn it repeatedly without pressing.

Both of these examples serve to dramatize a development of great potential in the field of men's clothing—the wash-and-wear suit.

Three types of summerweight wash-and-wear suits were introduced in 14 cities last year. Only 1,500 of them were available, but consumer reaction was so overwhelmingly favorable that clothing manufacturers intend to up their quotas this summer as much as material supplies will permit.

At the heart of the trend are Du Pont nylon, "Orlon" acrylic fiber and "Dacron" polyester fiber. The shape-and-press-retaining properties of the three chemical fibers make the new suits possible. The Witty tropical is all "Dacron". The other two suits—a seersucker of 60 per cent "Orlon" and 40 per cent cotton, and a cord of "Dacron" and nylon—are made by Haspel Bros. and J. Schoeneman, respectively.

In all the suits, one or more of the three Du Pont fibers are used in shoulder and lapel padding, lining, pockets, seam tape and sewing thread, as well as in the exterior fabric. This insures 100 per cent washability.

There are obvious advantages to being able to wash a suit in a home machine, have it dry overnight and put it on again the next morning with the press still sharp. The saving in time and money is impressive, particularly in hot weather.

But wash-and-wears have another asset: they resist wrinkling to a remarkable degree, even on humid days. This is welcome news for those who want the hot-weather comfort of cord or seersucker combined with a neat appearance.

Du Pont asked 300 men who bought the Haspel seersucker last year what they thought of it. Nine out of ten, after washing the suits an average of five times, said the wrinkle-resistance was superior to that of any other seersucker they'd ever owned. Wrinkles that did appear, they said, hung out quickly or came out in the wash.

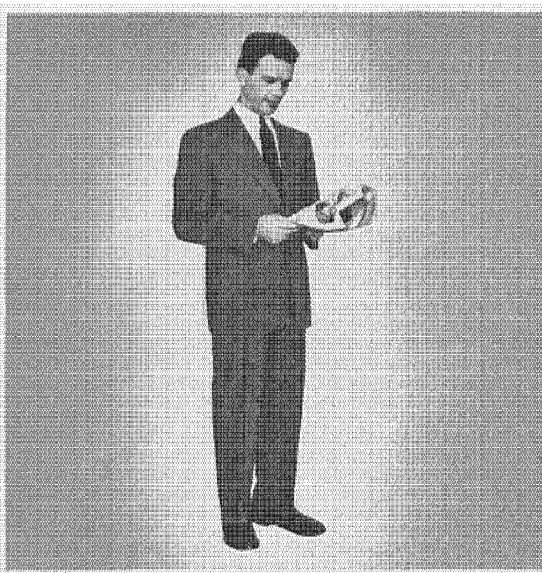
Forty-nine buyers of the Schoeneman cord also were queried. Forty-eight said the suit required less pressing than any other cord suit they'd worn.

In both cases, 90 per cent of the men surveyed said they intended to buy another.

Wash-and-wear suits are relatively high priced. The seersucker will retail for about \$40 this year, the cord for perhaps \$50, and the tropical for \$100. Some stores consider this an obstacle to sales; others say it isn't if the extra value of the suits is demonstrated properly.

Spencer Witty, for one, thinks prices will come down as production is stepped up all along the line, from fiber manufacture to suit manufacture.

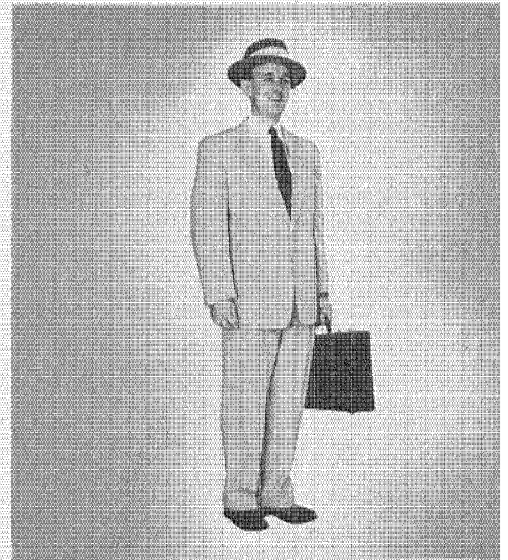
"There's no question about it in my mind," he says. "The washable suit is the suit of the future."



THREE WASIL-AND-WEAR SUITS: Haspel seersucker ("Orlon" and cotton), Witty tropical (all "Dacron"), and Schoeneman cord ("Dacron" and nylon). Du Pont fibers help the suits retain a press despite laundering.



INTO THE SUDS goes the Schoeneman suit. It's put through the washing and rinsing cycles, but *not* the drying step. Instead, it's suspended from hangers and allowed to drip dry. All three suits should be washed this way.



DRIED OVERNIGHT, the suit can be worn again the next day without pressing, as shown here. Wash-and-wear suits also resist wrinkling, are ideal for travel wear. They'll be on sale this year, although in limited numbers.



It's in the bag

Alert merchandisers are cutting costs and improving product protection with packages coated with "Alathon" polyethylene resin

By W. H. EASTON

A little over a year ago Walgreen's drug stores were facing a tough merchandising problem. Fresh orange juice was big business in the drug chain's 400 soda fountains. In fact, more than 12,000,000 glasses had been served during 1951 at 15 cents a glass.

But squeezed-to-order orange juice left much to be desired. Surveys showed that squeezing oranges for one glass of juice took an average of 2.8 minutes—slow work at a busy fountain. In addition, there was the expense and bother of handling heavy crates and disposing of empty peels.

In tackling the problem, Walgreen's executives

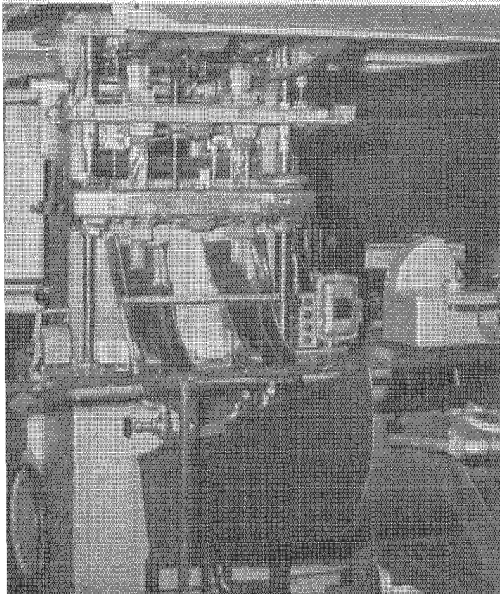
first investigated automatic squeezing machines. That solution looked too expensive, so they took the problem to the Pasco Packing Co., Dade City, Fla., a large producer of frozen citrus concentrate. Working closely with the Standard Packaging Co. of Jersey City, Pasco engineers soon came up with a recommendation: single-service packages of frozen orange juice concentrate. The idea was immediately accepted by Walgreen, subject to the working out of technical details. The wheels began to roll in February 1952.

Pasco and Standard engineers found they needed a 2½-oz. package that would be transparent, water-

A hundred sealed packages a minute run off this machine at Pasco Packing Co.

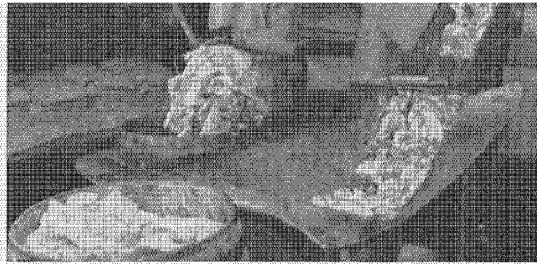
The earliest machine used for the packaging of frozen orange juice concentrate was this model.

Emerging from freezing tunnel, bags go in cases and are rushed to cold-storage room

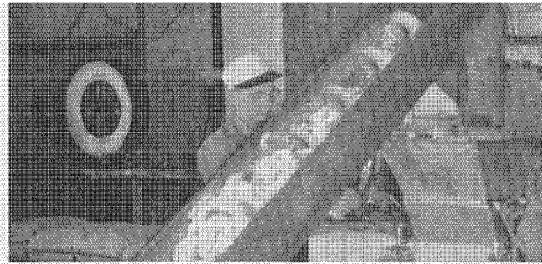




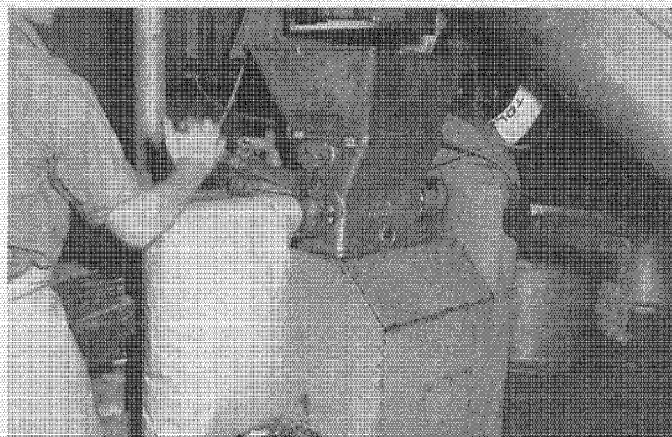
Meat trimmings are carried by screw conveyor at Oscar Mayer.



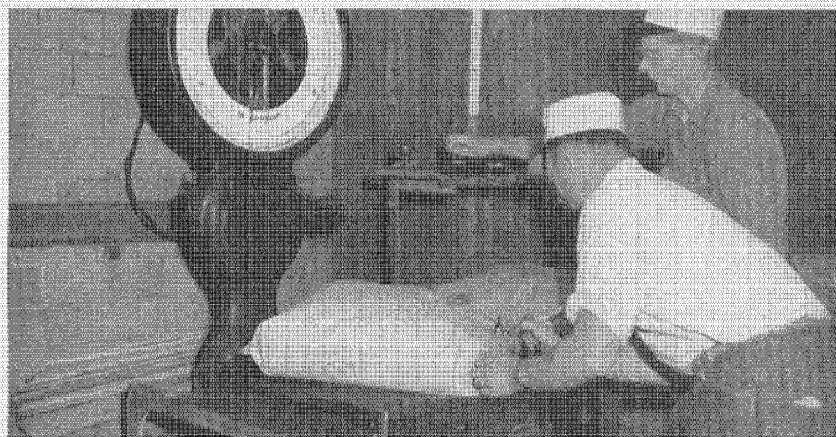
Before starting their upward journey, trimmings are forked into this receiving hopper.



An automatic switch stops filling screw as soon as the preset weight has been reached.



The inside of multi-wall bag has a coating of "Alathon" polyethylene resin, keeps moisture from weakening bag.



Before being placed on pallets and moved to the cooler, bags are weighed again. They're easy to handle, and stack firmly on skids.

proof, strong, flexible at low temperatures, easily but securely heat sealed, airtight, and adaptable to conventional packaging equipment.

The answer was a pouch bag made of "Alathon" polyethylene resin laminated to cellophane. The cellophane on the outside supplied the needed transparency, tensile strength and protection from oxygen; the inner-lining of "Alathon" filled the requirements for low-temperature flexibility, ease of heat sealing, and low moisture-vapor transmission.

Production of these packages of juice concentrate began during the late spring of '52 and soon skyrocketed to a high of 250,000 units per day. This year the figure may triple. Walgreen's drug stores alone will probably sell about 30,000,000 units.

Another example of how "Alathon" is revolutionizing packaging is found in the meat-packing industry. For years Oscar Mayer & Co. of Madison, Wis. had been using heavy wooden barrels for shipping meat trimmings to their sausage kitchen in Chicago. But these containers were a nuisance. Washing and return shipping after each delivery were costly; the barrels were hard to handle and store, and had to be repaired frequently. And there was always the danger of the meat losing flavor and color during shipment.

The St. Regis Paper Co. of New York suggested that a multi-walled bag could do the job better. Cooperating with Oscar Mayer & Co., they worked out this recommendation: 75-lb. capacity, valve-type paper bags with coatings of "Alathon" on the inside.

They proved an immediate success. The coating

of "Alathon" prevents the moisture in the meat from weakening the bag. The bags eliminate return shipping cost, are easier to handle and store, and can be more quickly and thoroughly refrigerated. Finally, they help to retain the full flavor and color of the meat and to protect the natural juices.

Case histories like these are becoming common. Introduced commercially less than six years ago, coatings of "Alathon" on paper, aluminum foil, cellophane and similar materials are rapidly becoming the first choice of many packagers. Dairy companies, for example, are using heat-sealed pouch bags of "Alathon" and foil for highly water-absorbing nonfat dried milk. Meat packers are using combinations of cellophane and "Alathon" for lunch meats and bacon. Food companies are using packages coated with "Alathon" for granulated sugar, baking powder, dog food and lard. And industrial companies put the versatile resin to work in packaging products that range from peat moss to chemicals and cattle feeds.

To meet the needs of these products, packages coated with "Alathon" are being produced in many forms—pouch bags, single-ply bags, multi-wall bags, inner-wraps, over-wraps and cardboard cartons—all carefully designed to take advantage of the remarkable properties of the new coating.

What of the future of "Alathon" in packaging? Perhaps the clue lies in a statement made by a qualified observer when hearing of Walgreen's new package for orange juice concentrate: "There just won't be enough orange trees in Florida to supply the demand."

What's New

• **ULTRA-SHEER NYLON STOCKINGS**, made of a new 12 denier nylon yarn, will grace feminine legs this year. The new yarn, lightest and slenderest yet produced by Du Pont, meets industry and consumer demand for sheerer hosiery. Warning to women: this is "luxury" hose; the finer the denier the more delicate the yarn.

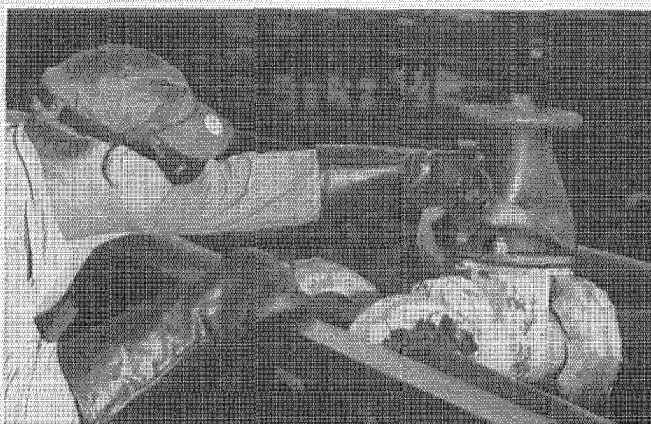
• **"GOING TO PAINT?"** is the title of a new 36-page booklet for homeowners. Liberally illustrated, it describes how to choose the correct paint for any home painting job and how to use it. A copy may be obtained free by writing the Du Pont Finishes Division, Room D-7147A, Wilmington, Del.



• **GIANT MOP** of Du Pont cellulose sponge, 14 inches wide, makes quick work of institutional floor cleaning. Pressing down on the metal handle wrings the mop and doubles it up in the middle so it can be dipped in the pail. The Hancock Quickie Mop Co., 20th and Oxford Sts., Philadelphia, is the maker.



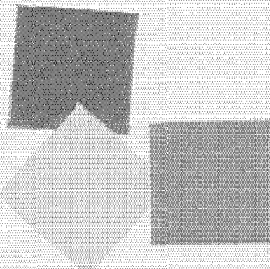
• **AN OUTER CYLINDER** of shatter-resistant "Lucite" acrylic resin is a feature of this barber pole made by the William Marvy Co., 479 St. Peter St., St. Paul, Minn. Marvy says "Lucite" is a special favorite of barbers located in sections where a barber pole is an inviting target for stones.



• **FLEXIBLE VALVE SHIELD** made of neoprene, Du Pont's chemical-resistant synthetic rubber, is designed for use on pipelines handling acids and other hazardous materials. It prevents acid from spraying on the operator if the valve packing should fail. Manufacturer is Industrial Products Co., 2820 N. Fourth St., Philadelphia.

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Corp.; Page 28, top: Courtesy H. J. Heinz Co.; Page 34: Courtesy *Modern Packaging*; Page 35: Courtesy *The National Provisioner*; Page 37, top: Courtesy National Paint, Varnish & Lacquer Assoc., Inc.; bottom: Courtesy Western Electric Co., Inc.; Page 38, bottom left: Courtesy *Vermont Life* (Big Bromley ski area); bottom right: Courtesy Hiram Walker and Sons, Inc.; Page 39, left: Courtesy American Viscose Corp.; right: Courtesy *New Mexico Magazine*; Page 40: Courtesy Ford Motor Co.



On the battlefield, the football field and the baseball diamond; in the office, the textile mill and the hospital, our lives are . . .

Coded by color

The infantryman was cut off and out of ammunition when Allied planes parachuted supplies. Some of the chutes, red in color, carried rations. Green meant ammo. The GI dashed for the one he needed.

A flier was downed in the Pacific, waiting on a raft for help to come. He took a packet of dye and dropped it into the water as a sea marker. Up above, a rescue plane spotted the yellowish water.

Another observer was on land, studying the effect of an Allied bombardment. He picked up his field radio and reported: Your red smoke shell landed at position so-and-so. The men behind the guns zeroed on the target.

These military uses of dyes for identification—to which could be added the familiar signal flags—have dozens of civilian cousins. Some save lives; others cut time and confusion; still others save money or help make it.

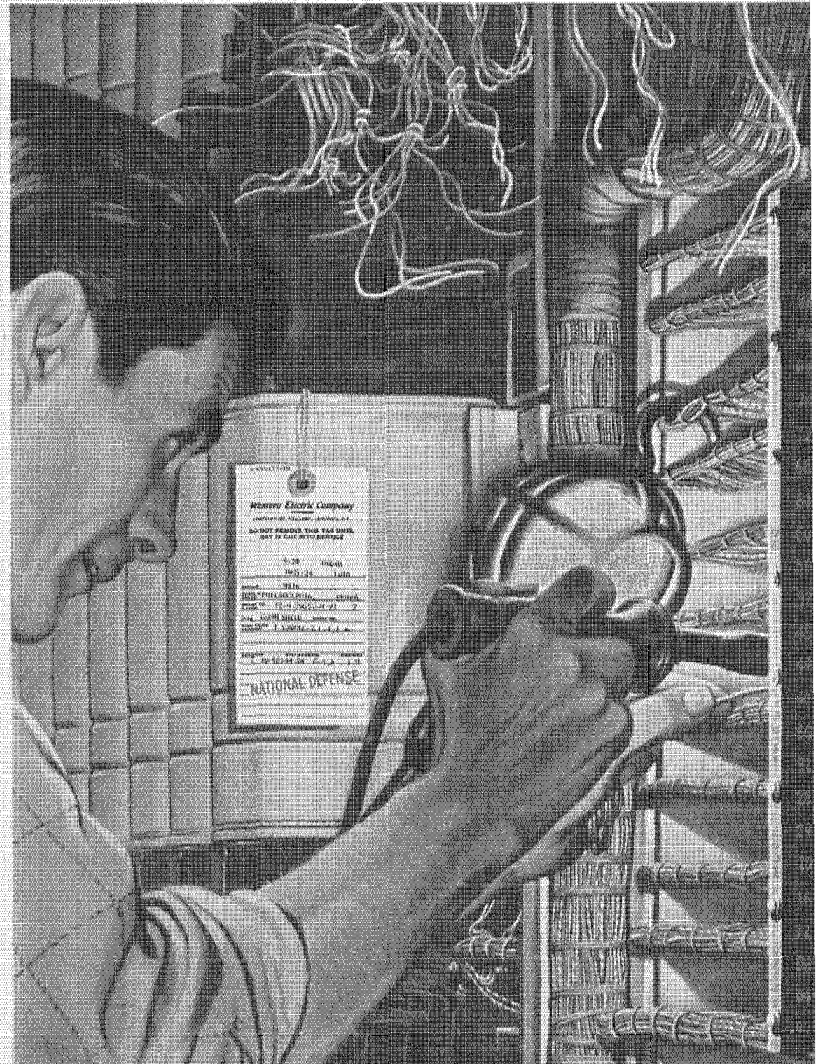
In the field of sports, the hunter who wears a bright red jacket isn't doing so because it's pretty. He doesn't wish to be mistaken for a deer by another hunter. Skiers who don gaily colored jackets and sweaters lean more toward glamour, but the quick attention value of the colors helps warn others and forestall collisions.

Sports color identification, of course, is a key-stone of football, racing, and baseball. Witness even the names: the St. Louis Browns, the Cincinnati Reds, the Red Sox, the Kansas City Blues. Schematic colors apply not only to players' uniforms but to bands, cheerleaders, pennants, and even tickets.

These dyed tickets save a lot of bother for the man at the gate. When the tickets start pouring in, he can't stop to read the date on them. He simply knows that this week's tickets are green, last week's were yellow,

and next week's will be gray. Wrong color, wrong ticket.

Most fans don't think much about the influence of color identification in sports until they're without it. That's where early TV left them. A football team with



Many-hued coverings for telephone wires make simpler an otherwise bewildering identification task.



Coded by color, theater and sports tickets are easier to handle. Colored business forms have same advantage.

green jerseys would appear on the screen; then one with blue jerseys. How do you tell them apart in black and white? Telecasters caught onto this quickly; they made sure that football teams, and even boxing opponents, wore radically different uniforms that would

Which skiers flash the quickest warning of their approach? The red-garbed ones, of course, as they add safety to glamour.



Among other things, the words you're reading come to you by courtesy of color, and show how dyes are important in business as in sports. This story was originally typed on a nine-copy business form, with five differently colored copies in addition to white ones. The green copy was for our policy reviewer, the pink for our technical consultant, the orange for the proof-reader, the yellow for the typesetter, and the blue for permanent file. With this speedy color identification, our magazine is put together with less confusion and chance for error.

DYES CUT CONFUSION IN MILLS

The textile industry has a similar scheme. When weaving cloth, an operator often works with a variety of differently made white yarns. One may have a right-hand twist, another a left-hand twist, etc. At that stage, they all look pretty much alike. If they go into the wrong spots, there's trouble. For this reason, many mills precolor the different yarns with fugitive dyes that wash out easily. During weaving, then, there can't be any confusion and the identifying colors are simply removed later.

Hospitals, on the other hand, use dyes as signposts on finished textiles. The George Washington University Hospital in Washington, D. C. is one. In its laundry room, it uses different colors to identify linens used in various parts of the hospital. "This makes sorting easier," the superintendent has told us. "Green for one area isn't mixed up with blue for another."

Another smart trick of hospitals is dyeing their old linens used for rags. In this way, extra-dirty rags

These orange parachutes are easy to spot against the snow. In military usage, colors also indicate what the chute carries.



It's no joke when a hunter confuses a fellow hunter with a deer. Bright caps, jackets help prevent this.

don't get thrown into the regular wash, but can be recognized and treated separately.

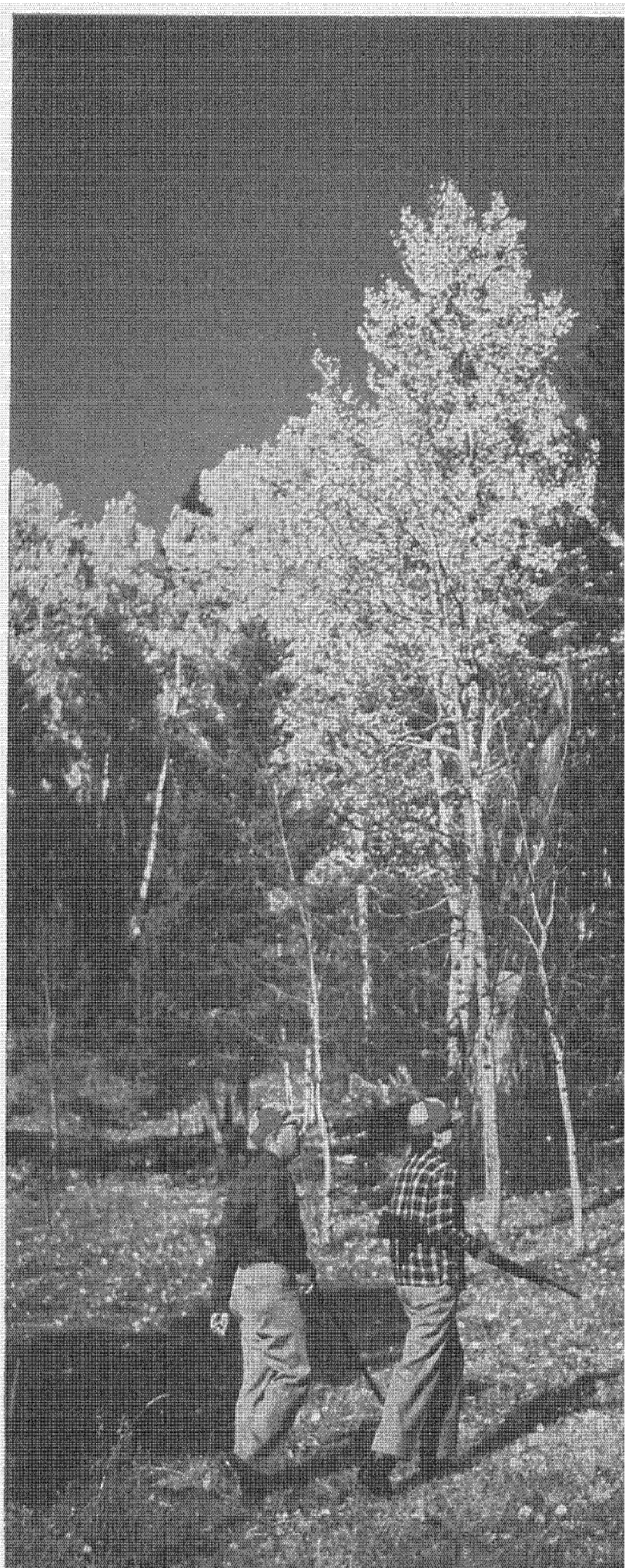
Still on the subject of health, we heard recently of a new and unusual use for color. A bright dye was put into a septic tank to trace any possible seepage into the local water supply. Sanitation people have a valuable ally here.

Shading off from strict color identification is the field of promotion-by-color. A large eastern department store, for instance, puts purchases into distinctive blue bags and boxes. As the purchaser continues her shopping, others recognize the package, and are reminded of the store.

Many manufacturers also use distinctively dyed shipping cases for brand identification, and cigarette companies sometimes match the color of their cartons to the color of their individual packs.

And so it goes. More and more, we're accepting color as a guidepost along the road to safety, convenience and economy. There's only one spot where identification-by-dyes has left the local scene. That's the use of royal purple to designate rulers. After the American Colonies returned that piece of color identification to King George III, this country went a step further. Our dye industry, built by this Company and others since World War I, has made purple, and every other hue, so inexpensive and dependable that ancient royalty would turn green with envy.

In TV's early days, lack of color in uniforms made it harder to follow the action. Color TV will be a boon in this respect.





Penny wise, corrosion foolish

"Drain my antifreeze in the spring?" said an acquaintance of ours the other day. "No indeed, it's permanent. Can't hurt anything to leave it in; in fact, the rust inhibitor in it is good for the cooling system. So why bother?"

Sounds like a sensible idea—but it isn't, according to the National Bureau of Standards. Recently, that organization confirmed the opinion of Du Pont and other antifreeze makers that this reasoning is deceptive. Permanent antifreeze is about as permanent as a permanent wave.

The National Bureau of Standards points out in its circular 506 that "during use, antifreeze is subjected to several conditions that cause it to change its properties. Inhibitors are depleted by exhaust gas leaking into the cooling system." The chemical reaction between the inhibitors, added to protect the cooling system from corrosion and rust, and the corrosive gases produces salts. Even the addition of new inhibitor cannot keep them from causing corrosion.

Depending on the condition of the cooling system, this chemical change can occur in a few months. Even the best inhibitors do not have unlimited reserve capacity to neutralize acid-forming gases that may be present in the cooling system. Thus the continued use of the antifreeze for more than one season can result in excessive corrosion and clogging.

"Under some conditions, it is possible to use a solution for more than one season without harm," says the Bureau of Standards. "Chemical analysis of the used antifreeze solution to determine whether it is still usable is much more expensive than new antifreeze.

"In view of the comparative cost of antifreeze and of even so minor a replacement part as a water pump or radiator, it is certainly cheaper in the long run to use new solutions each year." After all, we could add, even the finest motor oil becomes contaminated with use and must be drained periodically.

Bring the outdoors indoors with *SKY COLORS*

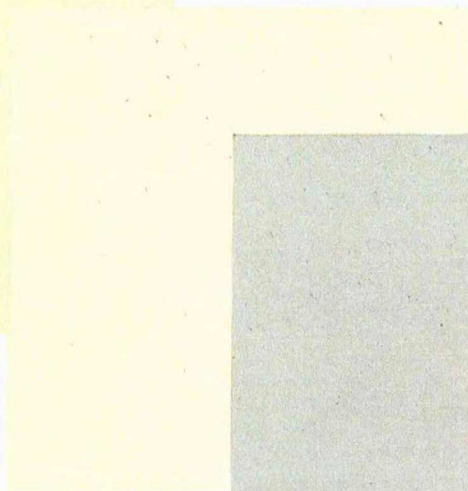
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